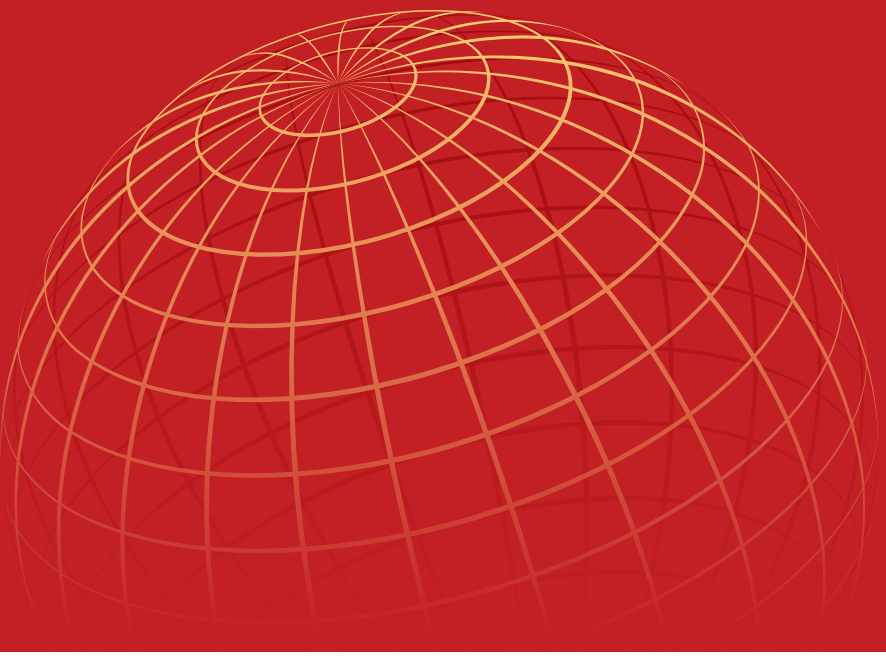


CHAPTER 4

# THE FOURTH WAVE

## Rapid Debt Buildup

*The global economy has experienced four waves of debt accumulation over the past fifty years. The first three ended with financial crises in many emerging market and developing economies. During the current wave, which started in 2010, the increase in debt in these economies has already been larger, faster, and more broad-based than in any of the previous three waves. Current low interest rates —which markets expect to be sustained into the medium term—appear to mitigate some of the risks associated with high debt. However, emerging market and developing economies are also confronted by weak growth prospects, mounting vulnerabilities, and elevated global risks. A menu of policy options is available to reduce the likelihood of the current debt wave ending in crises and, if crises were to take place, to alleviate their impact.*

## Introduction

Waves of rapid debt accumulation have been a recurrent feature of the global economy over the past fifty years, in both advanced economies and emerging market and developing economies (EMDEs). Since the 2008-09 global financial crisis, another wave has been building, with global debt reaching an all-time high of about 230 percent of global GDP in 2018 (Figure 4.1).

Total EMDE debt reached almost 170 percent of GDP in 2018 ($55 trillion), an increase of 54 percentage points of GDP since 2010. Although China accounted for the bulk of this increase—in part due to its sheer size—the debt-buildup was broad-based: In about 80 percent of EMDEs total debt was higher in 2018 than in 2010. Following a steep fall during 2000-10, debt has also risen in low-income countries (LICs), reaching 67 percent of GDP (around $270 billion) in 2018, up from 48 percent of GDP (around $140 billion) in 2010.

In contrast, in advanced economies, total (public and private) debt has remained steady near the record levels reached in the early aftermath of the global financial crisis, at 264 percent of GDP in 2018 ($130 trillion). While government debt has risen to a high of 104 percent of GDP ($50 trillion), private sector debt has fallen slightly amid deleveraging in some sectors.

The current environment of low interest rates, combined with subpar global growth, has triggered a lively debate about the benefits and risks of further government debt accumulation to finance increased spending. It is generally agreed that public borrowing can be beneficial, particularly in EMDEs with large development challenges, if it is used to finance growth-enhancing investments, such as infrastructure, health care, and education. Debt accumulation can also be appropriate temporarily as part of counter-cyclical fiscal policy, to boost demand and activity in economic downturns.

However, high debt carries significant risks for EMDEs, as it makes them more vulnerable to external shocks. The rollover of existing debt can become increasingly difficult during periods of financial stress, potentially leading to a crisis. High government debt levels can also limit the size and effectiveness of fiscal stimulus during downturns, and can dampen longer term growth by weighing on productivity-enhancing private investment.

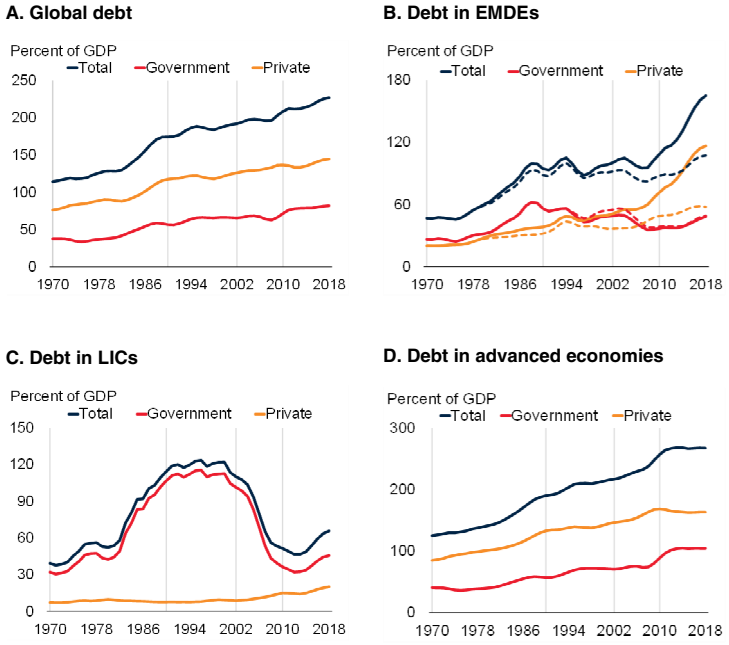
EMDEs have been navigating dangerous waters as the current debt wave has coincided with a decade of repeated growth disappointments, and they are now confronted by weaker growth prospects in a fragile global economy (Kose and Ohnsorge 2019). In addition to their rapid debt buildup during the current wave, these economies have accumulated other vulnerabilities, such as growing fiscal and current account deficits, and a compositional shift toward short-term external debt, which could amplify the impact of shocks.

Thus, despite current exceptionally low real interest rates, including at long maturities, the latest wave of debt accumulation could follow the historical pattern and eventually culminate in financial crises in EMDEs. A sudden global shock, such as a sharp rise in interest rates or a spike in risk premia, could lead to financial stress in more

Note: This chapter was prepared by a team led by M. Ayhan Kose, Peter Nagle, Franziska Ohnsorge, and Naotaka Sugawara, with contributions from Jongrim Ha, Alain Kabundi, Sergiy Kasyanenko, Wee Chian Koh, Franz Ulrich Ruch, Lei (Sandy) Ye, and Shu Yu. It is based on Kose et al. 2019. Vanessa Banoni, Julia Norfleet, Jankeesh Sandhu, Shijie Shi, and Jinxin Wu provided research assistance.

## FIGURE 4.1 Evolution of debt

*Global debt has trended up since 1970, reaching around 230 percent of GDP in 2018. Debt has risen particularly rapidly in EMDEs, reaching a peak of about 170 percent of GDP in 2018. Much of the increase since 2010 has occurred in the private sector, particularly in China. Debt in low-income countries has started to rise after a prolonged period of decline following debt relief measures in the late 1990s and 2000s. Advanced-economy debt has been broadly flat since the global financial crisis, with increased government debt more than offsetting a mild deleveraging in the private sector.*




Source: International Monetary Fund; World Bank.
Note: Averages computed with current U.S. dollar GDP as weight and shown as a 3-year moving average. Vertical lines in gray are for years 1970, 1990, 2002, and 2010.
B. Dashed lines refer to EMDEs excluding China.
Click here to download data and charts.

vulnerable economies. Indeed, these risks were illustrated by the recent experiences of Argentina and Turkey, which witnessed sudden episodes of sharply rising borrowing costs and severe growth slowdowns in 2018.

Among LICs, the rapid increase in debt and the shift from concessional toward financial market and non-Paris Club creditors have raised concerns about debt transparency and debt collateralization. Elevated debt in major EMDEs, including China, could amplify the impact of adverse events and trigger a growth slowdown, posing risks to global and EMDE growth.

Against this backdrop, this chapter compares the current wave of debt buildup to previous episodes and considers the policy implications. The chapter employs a wide range of approaches, including event studies, econometric models, country case studies, and a detailed review of historical episodes. Specifically, it examines the following questions.

- How have previous waves of debt in EMDEs evolved?
- How does the current wave of debt accumulation compare to earlier waves?
- What are the macroeconomic implications of rapid debt accumulation?
- What are the lessons and policy implications for EMDEs?

**Contributions.** An extensive literature has studied various aspects of debt accumulation, especially in the context of government and private debt crises. This chapter adds to this literature in five dimensions. ***First***, the chapter provides the first in-depth analysis of the similarities and differences among four distinct waves of broad-based debt accumulation in EMDEs since 1970.[1] Each wave contains episodes that have been widely examined in the literature but they have rarely been put into a common framework. Examining debt buildups as waves allows a richer analysis by considering the interaction of global drivers with country-specific conditions. Earlier work has taken on a longer historical perspective and focused mainly on debt developments in advanced economies, typically based on case studies. *Second*, in contrast to earlier studies, the chapter puts the ongoing (fourth) wave of broad-based debt accumulation in EMDEs into historical perspective.[2] *Third*, the

[1] Previous studies have examined the impact of mounting government debt in advanced economies (BIS 2015; Cecchetti, Mohanty, and Zampolli 2011; Erhardt and Presbitero 2015; Eichengreen et al. 2019; Mbaye, Moreno-Badia, and Chae 2018a; OECD 2017; Panizza and Presbitero 2014; Reinhart, Reinhart, and Rogoff 2012). For EMDEs, previous studies have often analyzed certain periods of debt distress, or crises in individual countries. For example, contagion from the Asian crisis has been examined by Baig and Goldfajn (1999); Chiodo and Owyang (2002); Claessens and Forbes (2013); Glick and Rose (1999); Kaminsky and Reinhart (2000, 2001); Kawai, Newfarmer, and Schmukler (2005); Moreno, Pasadilla, and Remolona (1998); and Sachs, Cooper, and Bosworth (1998).

[2] The recent debt accumulation, without the historical context, have been discussed in IMF (2019a, 2016a) and World Bank (2015, 2016a, 2017a).

chapter undertakes the first comprehensive empirical analysis of a large number of individual episodes of rapid government and private debt accumulation in 100 EMDEs since 1970. The separate analysis of individual episodes offers key insights into the macroeconomic consequences, at the country level, of debt accumulation. Earlier work has examined developments in government and private debt markets separately, or focused on a smaller group of (mostly advanced) economies or regions.[3] *Fourth,* the chapter identifies the most frequent triggers of crises and the country-level vulnerabilities that contribute to or exacerbate crises. *Fifth*, armed with insights from an extensive analysis of the global and national waves of debt accumulation and the empirical linkages between elevated debt and financial crises, as well as the earlier literature, the study distills lessons and presents a rich menu of policy options that can help EMDEs boost resilience to future crises.

The chapter documents the following findings.

**Three previous waves.** Prior to the current wave, EMDEs experienced three waves of broad-based and rapid debt buildup. The first (1970-89) was focused in Latin America and the Caribbean (LAC) and Sub-Saharan Africa (SSA), the second (1990-2001) in East Asia and Pacific (EAP) and some other EMDEs in Europe and Central Asia (ECA) and LAC, and the third (2002-09) was chiefly in ECA. The fourth wave (2010 onwards), in contrast, has covered all EMDE regions.

**Similarities and differences among previous waves.** All debt waves began during prolonged periods of very low real interest rates, and were often facilitated by changes in financial markets that contributed to rapid borrowing. The three earlier waves all ended with widespread financial crises and coincided with global recessions (1982, 1991, and 2009) or downturns (1998, 2001). Crises were usually followed by reforms designed to lower external vulnerabilities and strengthen policy frameworks. These similarities notwithstanding, the financial instruments used for borrowing have shifted over time as new instruments or financial actors emerged. The nature of EMDE borrowers in international financial markets has also changed, with the private sector accounting for a growing share of borrowing through the first three waves.

**Another global wave of debt underway.** The debt buildup in EMDEs in the fourth wave, which started in 2010, has already been larger, faster and broader-based than in any of the previous waves. The annual increase in EMDE debt since 2010 has been larger, by some margin, than during the first three waves. Whereas previous waves were largely regional in nature, the fourth wave was global, with total debt rising in more than 70 percent of EMDEs in all regions and rising by at least 20 percentage points of GDP in more than one-third of EMDEs. In the fourth wave, most national episodes of debt accumulation combined government and private debt accumulation, in contrast to the previous three waves which had a greater focus a single sector.

**Debt buildups often associated with crises.** Since 1970, there have been about 520 national episodes of rapid debt accumulation in 100 EMDEs. Around half of these episodes were accompanied by a financial crisis, with sizeable economic costs. Crises during rapid *government* debt buildups featured larger output losses than crises during rapid *private* debt buildups.

**Debt accumulation as shock amplifier.** While financial crises during rapid debt accumulation episodes were often triggered by external shocks, such as sudden increases in global interest rates, domestic vulnerabilities often increased the likelihood of crises and amplified their adverse impact. Most countries where crises erupted suffered from unsustainable combinations of inadequate fiscal, monetary, or regulatory frameworks. Crises were more likely, or the economic distress they caused was more severe, in countries with higher external debt—especially short-term—and lower levels of international reserves.

[3] Government debt crises have been discussed in Kindleberger and Aliber (2011); Reinhart, Reinhart, and Rogoff (2012); Reinhart and Rogoff (2010, 2011); and World Bank (2019a). Credit booms have been examined in Dell'Arricia et al. (2014, 2016); Elekdag and Wu (2013); Jordà, Schularick, and Taylor (2011); Mendoza and Terrones (2008, 2012); Ohnsorge and Yu (2016); and Tornell and Westermann (2005).

**Policy implications.** While there is no magic bullet of a policy prescription to ensure that the current debt wave proceeds smoothly, the experience of past waves of debt points to the critical role of policy choices in determining the outcomes of these episodes. Sound debt management and debt transparency can help reduce borrowing costs, enhance debt sustainability, and dampen fiscal risks. Strong monetary, exchange rate, and fiscal policy frameworks can safeguard EMDEs' resilience in a fragile global economic environment. Robust regulatory and supervisory regimes, which are also well coordinated between home and host supervisors of foreign banks, can help contain financial market risks and encourage prudent lending to the private sector. Good corporate governance can help ensure that debt is used for the most productive purposes.

# Evolution of past waves of debt

The buildup of EMDE debt since 1970 has not been linear. At different points in time, different countries, and regions, have undergone periods of rapid debt accumulation (Figure 4.2). These have often been followed by crises, and periods of deleveraging. This section examines "waves" of broad-based debt accumulation in EMDEs, and considers their similarities and differences. It identifies four waves of debt since 1970, of which the fourth is still ongoing.

## Identification of the four waves

The dating of the four waves meets some basic criteria.

- The first wave begins in 1970.[4] Data limitations prevent more detailed analysis of the period prior to 1970.
- The end of a wave is broadly defined as the year in which the total debt-to-GDP ratio in the affected region or country group peaks and is followed by two consecutive years of decline.
- The dating of the end of waves is consistent with the approximate timing of policies to resolve the financial crises that they engendered. In 1989, for example, Mexico issued the first Brady bonds, marking the beginning of resolution of the Latin American debt crisis. In 1998-2001, a series of IMF programs led to debt resolution after the East Asian and Russian financial crises. In 2009, governments implemented a large-scale, internationally coordinated policy stimulus to combat the adverse effects of the global financial crisis.

## Features of the first three waves

This identification yields three historical waves of global debt accumulation and one ongoing. The first wave runs from 1970 to 1989, the second from 1990 to 2001, the third from 2002-09, and the fourth since 2010.

### *First wave*

The ***first wave*** spanned the 1970s-80s, with borrowing primarily accounted for by governments in LAC and low-income countries in SSA (Kose et al. 2019). The combination of low interest rates and a rapidly growing syndicated loan market encouraged EMDE governments to borrow heavily (Gadanecz 2004).

**LAC.** The debt buildup was greatest in LAC, which accounted for over half of all debt flows to EMDEs in 1973-81 (Bertola and Ocampo 2012; Devlin 1990). As part of a strategy of import substitution industrialization, countries relied on external debt to finance infrastructure and investment in heavy industries (Baer 1972; Bruton 1998; Diaz-Alejandro, Krugman, and Sachs 1984). Many LAC economies borrowed from international banks via new syndicated loan markets, which provided a way to recycle dollar-denominated oil revenues from oil-exporters to importers (Altunbaş, Gadanecz, and Kara 2006).

Vulnerabilities mounted, as widening current account and fiscal deficits were financed by

[4] 1970 is also used as the starting year by Laeven and Valencia (2018) in their database of financial crises.

external debt, and inflation rose, while pegged exchange rate regimes were backed by low levels of reserves. The late 1970s and early 1980s saw a series of global shocks, including an oil price spike and U.S. monetary policy tightening that accompanied a global recession. The crisis began in 1982 with Mexico announcing that it would not be able to service its debt, and spread rapidly to other LAC and SSA countries. The U.S. administration's Brady plan eventually provided comprehensive debt relief in 1989 (Cline 1995; Unal, Demirgüç-Kunt, and Leung 1993). The debt crisis resulted in a "lost decade" in LAC, with GDP per capita not recovering its pre-crisis level until 1993, after having grown by 50 percent during 1970-1980 (Loayza, Fajnzylber, and Calderón 2005).

**SSA.** Many low-income countries (LICs), especially in SSA, borrowed heavily in the 1970s and 1980s from official creditors (Daseking and Powell 1999). Debt was typically used to finance domestic-focused industry (Greene 1989). Amid rising global interest rates and deteriorating terms of trade, several countries suffered debt crises in the 1980s (Dornbusch, Branson, and Cline 1985). In response, the World Bank and IMF provided financial support for adjustment programs, while the Paris Club creditors agreed to "flow rescheduling," under which debt principal and interest payments were delayed. While these policies helped with liquidity issues, they led to a steady increase in debt (Dicks 1991).

While growth in LICs was robust in the 1970s, it was persistently weak in the subsequent two decades with income per capita falling during 1980-99 amid rapid population growth. Eventually, the World Bank and IMF, along with other multilaterals and bilateral creditors, announced the "Heavily Indebted Poor Countries" (HIPC) initiative in 1996, which was followed by the Multilateral Debt Relief Initiative (MDRI) in 2005 (IMF 2006; World Bank and IMF 2017a).

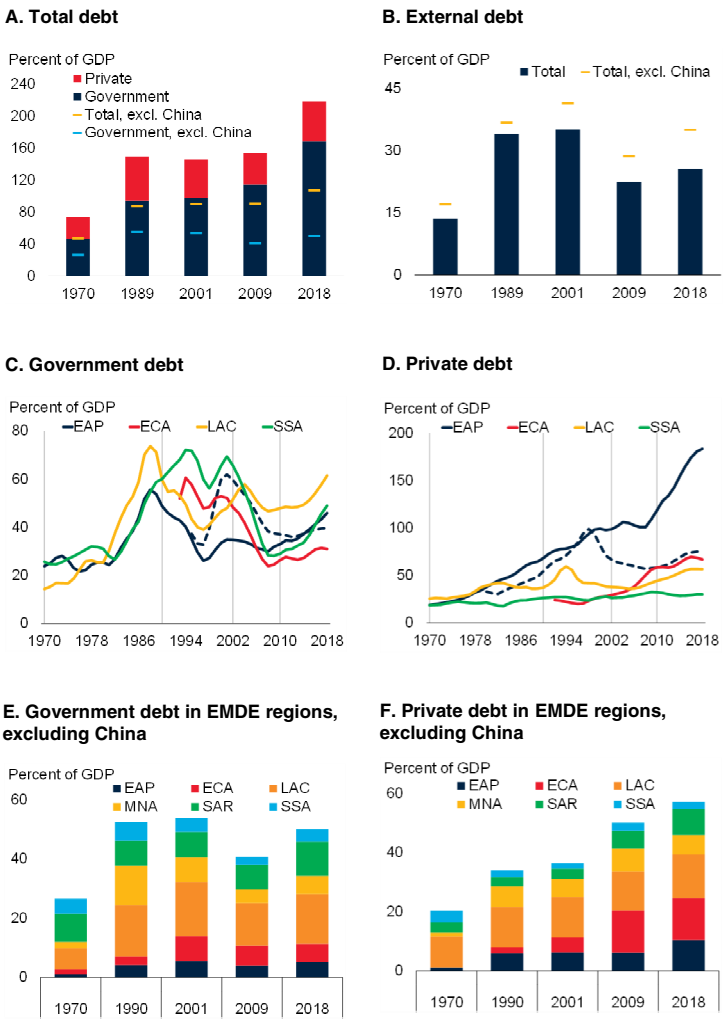
### *Second wave*

The ***second wave*** ran from 1990 until the early 2000s as financial and capital market liberalization enabled banks and corporates in EAP and governments in ECA to borrow heavily; it ended with crises in these regions in 1997-2001.

**EAP.** The EAP region registered one of the fastest increases in private debt in the 1990s. Poor bank regulation and supervision, together with implicit government guarantees for banks and corporates, encouraged risk taking by the domestic financial sector and allowed already highly leveraged

## FIGURE 4.2 Debt in EMDEs

*The region and sector of debt accumulation has varied substantially over the four EMDE waves (1970-1989, 1990-2001, 2002-09, and since 2010).*




Source: International Monetary Fund; World Bank.
A. B. Light blue and yellow lines exclude China.
C.D. Averages computed with current U.S. dollar GDP as weight and shown as a 3-year moving average. Dashed lines for EAP refer to EAP excluding China. Lines for ECA start in 1995 due to smaller sample size prior to that year. Vertical lines in gray are for years 1970, 1990, 2002, and 2010.
E.F. GDP-weighted averages. EAP = East Asia and Pacific, ECA = Europe and Central Asia; LAC = Latin America and Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.
Click here to download data and charts.

corporates to borrow heavily (Kose et al. 2019). Countries also suffered from poor corporate governance, a prominent presence of state-owned enterprises (e.g., Thailand), weak business climates (e.g., Indonesia), and heavy investment in non-tradeable sectors such as commercial real estate (e.g., Thailand; Krugman 2000). Rising private debt, particularly short-term debt, left several EAP countries (Indonesia, Malaysia, Philippines, and Thailand) vulnerable to a reversal in capital flows.

In early 1997, capital inflows to Thailand began to taper off amid investor concerns about external debt sustainability. Despite government intervention in early 1997, Thailand was forced to abandon its currency peg in July 1997. Financial markets quickly turned on countries with similar vulnerabilities, and Indonesia, Korea, Malaysia, and the Philippines experienced large capital outflows which resulted in substantial pressure on their currencies (Corsetti, Pesenti, and Roubini 1998; Kawai, Newfarmer, and Schmukler 2005).

Corporates were unable to service their debt, resulting in large loan losses for banks and triggering banking crises. Governments created "bad banks" to absorb non-performing loans of commercial lenders, recapitalized banks, and improved corporate debt restructuring regimes (Mishkin 1999). Prior to the crisis, the sharp rise in borrowing among EAP countries was accompanied by rapid GDP growth but, during the crisis, GDP and investment growth plummeted.

**LAC and ECA.** The late 1990s saw crises occur in some other major EMDEs, notably Russia, Argentina, and Turkey. These countries experienced sovereign debt crises when a broad-based loss of investor confidence triggered capital outflows and forced governments to abandon currency pegs. A notable exception was Brazil, which suffered a currency crisis in 1999, but avoided a banking and sovereign debt crisis. The authorities dampened exchange rate depreciation, but at considerable fiscal cost. The earlier "Tequila crisis" in 1995 also falls into the second wave, when Mexico accepted assistance from the IMF and others to stem a currency crisis but avoided a full sovereign debt crisis (Laeven and Valencia 2018; Kose et al. 2019).

### *Third wave*

The ***third wave*** was a runup in private sector borrowing in ECA from U.S. and EU-headquartered "mega-banks" after regulatory easing and amid initially accommodative monetary policy in advanced economies (Cetorelli and Goldberg 2011). While the buildup of debt in the third wave primarily occurred in advanced economies, the emerging mega-banks fueled a steep increase in direct cross-border lending on the interbank market, lending through subsidiaries, and investment in EMDE debt markets (Balakrishnan et al. 2011).

This wave ended when the global financial crisis disrupted bank financing in 2008-09 and tipped several ECA economies into deep recessions (Aslund 2010). The crisis in ECA was short-lived, in part due to IMF and EU support (Berglof et al. 2009). In contrast to the ECA region (and advanced economies), most EMDEs proved resilient to the global financial crisis, in part because they had limited exposures to the actual global shocks at the time (Kose and Prasad 2010). Many EMDEs also improved debt management, supporting a reduction in currency, interest and maturity risks (Anderson, Silva, and Velandia-Rubiano 2010).

## Similarities and differences between waves

The first three waves of broad-based debt accumulation featured several similarities (Box 4.1). At the beginning of each wave, the initial debt buildup was associated with low or falling global interest rates and major changes in financial markets, often in response to deregulation. The first three waves eventually witnessed severe and widespread financial crises in EMDEs with severe macroeconomic consequences, usually triggered by external shocks and amplified by domestic vulnerabilities. Financial crises were typically followed by reforms in affected countries to lower external vulnerabilities and strengthen policy frameworks.

There were also noticeable differences between the three waves. The sectors and regions that were the most active borrowers, and the financial instruments involved changed over the course of

the three waves: borrowing shifted from the government sector to the private sector, while the type of debt moved from syndicated loan markets in the first wave, to government bond markets and international private sector borrowing in the second wave, to cross-border and foreign-owned bank lending in the third wave. In all three waves, financial crises resulted in substantial economic damage, but their severity varied between waves and across regions. The waves also varied in terms of the speed of resolution, with sovereign debt crises typically taking longer to resolve, and having much larger negative macroeconomic impacts than private debt crises.

## The current wave of debt in historical context

Since 2010, another wave of debt accumulation has been building. The buildup has been global, but especially fast in EMDEs (Box 4.2, Figure 4.3). As a result, total debt in EMDEs has risen to almost 170 percent of GDP, on average, in 2018—a record high—from 114 percent of GDP in 2010 (Kose et al. 2019). China, where corporate debt has soared post-crisis, accounted for the bulk of this buildup—partly due to its sheer size—but the buildup was broad-based. Excluding China, total EMDE debt has risen to a near-record 107 percent of GDP in 2018. The debt-to-GDP ratio has risen in all EMDE regions with the exception of SAR, where it has been broadly flat, and in almost 80 percent of EMDEs, with more than one-third seeing increases of at least 20 percentage points of GDP.

The current, fourth, wave of debt accumulation bears many similarities to the previous waves. But there are also important differences. Among these is its sheer magnitude: it is the largest, fastest and most broad-based wave of debt accumulation yet.

### Similarities with the previous three waves

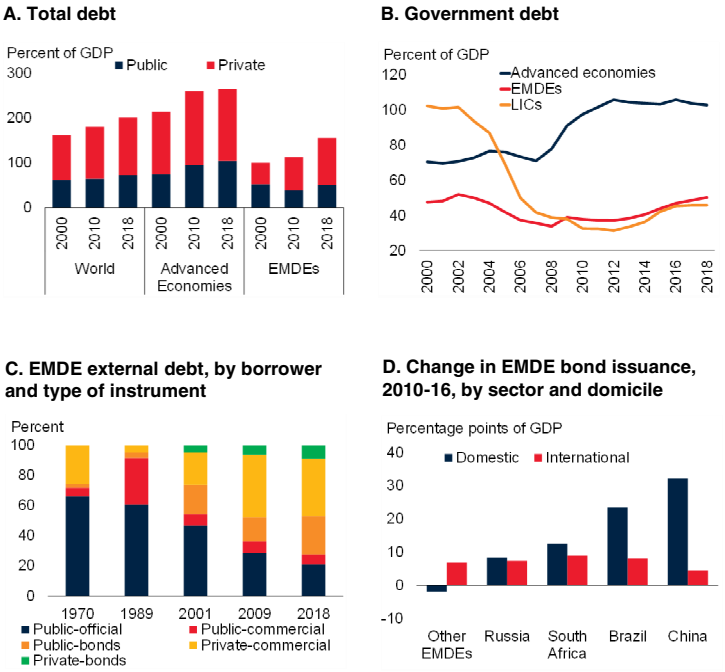
The fourth wave shares a number of features with earlier waves: a changing global financial landscape, mounting vulnerabilities, and concerns about inefficient use of borrowed funds.

**Financial landscape.** As in the previous three waves, the current wave has seen changes in financial markets, and very low interest rates (as a result of accommodative monetary policy following the global financial crisis). Financial systems in EMDEs have deepened and become more complex (Didier and Schmukler 2014). Both corporate and sovereign borrowers have increasingly accessed capital markets, in some regions following the retrenchment of large international banks. Over the past decade, more than 20 EMDEs have accessed international capital markets for the first time. In SSA, Eurobond issuance has grown, with several countries tapping the Eurobond market for the first time.

Domestic debt has also become increasingly important, with a rising share of local currency-denominated bonds (Essl et al. 2019; Kose and

**FIGURE 4.3 The fourth wave: Debt accumulation**

*Since the global financial crisis, another wave of debt accumulation has been underway. The fourth wave has been especially rapid in EMDEs, and has seen government debt increasing in tandem with mounting private sector debt. The share of debt accounted for by bonds has continued to rise, and large EMDEs have seen a sharp increase in domestically issued bonds.*




Source: International Monetary Fund; World Bank.
C. "Public-official" includes "private other" which is chiefly accounted for by export guarantee agencies.
D. Chart shows the change in debt securities (in percentage points of GDP) between 2010 and 2016 (last observation). Other EMDEs includes 8 countries. Data for India are unavailable.
Click here to download data and charts.

## BOX 4.1 Similarities and differences between the previous three waves

*In each of the first three waves of broad-based debt accumulation, the initial runup in debt was facilitated by changes in financial markets, and low real interest rates in major advanced economies. These waves witnessed severe financial crises in EMDEs, usually triggered by external shocks and amplified by domestic vulnerabilities. They typically led to policy reforms in affected countries to lower external vulnerabilities and strengthen monetary and fiscal policy frameworks. The three waves differed in the composition of borrowers; the financial instruments involved; the speed of crisis resolution; and their macroeconomic impact.*

### Introduction

Since 1970, there have been four waves of EMDE debt accumulation, of which the fourth one is still underway (see Kose et al. 2019 for a detailed discussion of each of these waves). The first wave spanned the 1970-80s, with a rapid accumulation of debt by governments in LAC and SSA which led to a series of defaults in the early 1980s, and ended with debt relief and restructuring occurring in the late 1980s-90s (LAC), and 1990s-2000s (SSA). The second wave ran from 1990 until the early 2000s as financial and capital market liberalization enabled banks and corporates in East Asia and the Pacific (EAP) and governments in Europe and Central Asia (ECA) to borrow heavily; it ended with a series of crises in these regions in 1997-2001. The third wave was a runup in private sector borrowing in ECA from U.S. and EU-headquartered "mega-banks" after regulatory easing; this wave ended when the global financial crisis disrupted bank financing in 2008-09 and tipped especially ECA countries into deep (albeit short-lived) recessions.

This box synthesizes the main features of the three waves that have by now concluded. In particular, it addresses the following questions in detail.

- What were their similarities?
- What were their differences?

### Similarities

The first three waves of broad-based debt accumulation featured several similarities. All of the waves had common drivers, including changes in financial markets and low interest rates. The waves also typically ended in crises with substantial macroeconomic impacts, which led to policy changes. In part as a result of these policy changes, countries weathered subsequent crises better.

#### *Beginning of the waves: Low global interest rates, changes in financial landscape*

The initial debt buildup in each wave was associated with low or falling global interest rates, and major changes in financial markets, often in response to deregulation. These enabled previously credit constrained borrowers to access international financial markets and accumulate debt. Shortcomings in domestic policy frameworks often contributed to rapid debt buildups, and exacerbated the severity of crises.

**Low or falling global interest rates**. The beginning of each of the three waves was associated with low, or falling, global real interest rates, which encouraged borrowing (Figure 4.1.1). In the first wave, the U.S. real policy rate averaged around 0.6 percent over 1970-79, with several years of negative real interest rates. During the second wave, the U.S. real policy rate declined from a high of 5 percent in 1989 to a low of 0.5 percent in 1993, as the Federal Reserve cut policy rates in response to the global recession in 1991. Similarly, the U.S. real policy rate fell into negative territory at the beginning of the third wave following the 2001 recession in the United States.

**New financial instruments**. The emergence of the syndicated loan market in the 1970s set the stage for the first wave. The introduction of Brady bonds in the 1990s spurred the development of sovereign bond markets that underpinned sovereign borrowing in the second wave, while capital account liberalization in many EMDEs in the 1990s, especially in EAP, facilitated private sector borrowing. The third wave in the 2000s largely consisted of cross-border flows via international banks in advanced economies after deregulation in the United States and the EU.

**Economic upturns**. The beginnings of the first and second waves coincided with recoveries from global recessions (1975, 1991, 2009) and the beginning of the third wave with the recovery from the global slowdown of 2001 (Kose and Terrones 2015).

#### *During the waves: Borrower country policies*

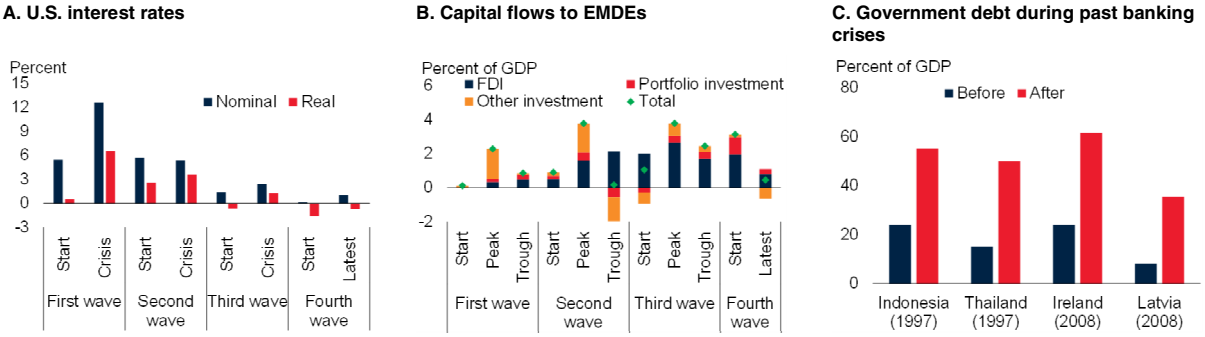
Borrower country policies often encouraged rapid debt accumulation, or exacerbated the risks associated with it. Fixed exchange rate regimes and weak prudential frameworks encouraged risk taking; weak fiscal frameworks encouraged unfunded government spending; and

Note: This box was prepared by Peter Nagle.

## BOX 4.1 Similarities and differences between the previous three waves *(continued)*

### FIGURE 4.1.1 Comparison of previous waves

*The start of each wave generally coincided with a period of low, or falling, interest rates. The end of waves was also associated with a sharp slowdown in capital inflows, which restarted as new waves got underway. Debt episodes that ended in banking crises typically resulted in large increases in government debt.*




Source: Bloomberg; International Monetary Fund; World Bank.

A. Start of a wave defined as the first three years of the wave. Crisis defined as the year before, and year of, widespread crises. For the first wave, these are 1970-72, and 1981-82. For the second wave, these are 1990-92, and 1996-97. For the third wave, these are 2002-04, and 2008-09. For the final wave, the start is 2010-12, and the "latest" is the final two years of the sample, 2017-18. Real interest rates are calculated as the difference of nominal interest rates and the GDP deflator.

B. Net capital inflows to EMDEs, in percent of GDP. The start of each wave is the first year, the peak is the peak capital inflow before the start of crises in the wave, and the trough is the lowest point after the crisis year. For the first wave, these dates are 1970, 1978, and 1988 respectively. For the second wave, they are 1990, 1995, and 2000. For the third wave, they are 2002, 2007, and 2009. The fourth wave begins in 2010 and the latest data are for 2018.

C. "Before" and "after" denote, respectively, one year before and after the onset of banking crisis, as shown by numbers below the corresponding country names, taken from Laeven and Valencia (2018). Indonesia refers to central government debt only.

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government spending priorities or weak prudential supervision directed funding to inefficient uses.

**Fixed exchange rate regimes**. During the first and second waves, especially, fixed or managed exchange rates in LAC, EAP and ECA encouraged capital inflows by leading lenders and borrowers to underestimate exchange rate risks. With interest rates on foreign currency loans below those for domestic currency loans and the fixed exchange rate interpreted as an implicit guarantee of foreign exchange claims, borrowers readily took on foreign currency-debt and domestic banks offered dollarized or euro-ized accounts on a large scale to local clients (Impavido, Rudolph, and Ruggerone 2013; Magud, Reinhart, and Rogoff 2011).

**Weak prudential frameworks**. Structural changes in financial markets were typically not accompanied by appropriate reforms to prudential or supervisory frameworks, allowing excessive risk-taking. In the second wave, for example, rapid liberalization of capital markets encouraged EAP banks to borrow heavily from international markets (Furman et al. 1998). In the third wave, the risks posed by growing cross-border lending and macro-financial linkages were underappreciated by financial supervisors (Briault et al. 2018; Claessens and Kose 2018).

**Weak fiscal frameworks**. In episodes of rapid government debt accumulation, in LAC and SSA in the first wave and in ECA in the second wave, many countries ran persistent fiscal deficits financed with external debt.

**Inefficient use of debt**. While debt flows were often used to finance productive investment, in some cases debt was used for domestic-facing investments, such as import substitution industrialization that eroded competitiveness in LAC in the first wave or construction and property booms that did not raise export revenues in EAP and ECA in the second and third waves. Weak corporate governance, including inadequate oversight of projects and investment decisions as well as declining profitability, also led to inefficient investment in several EAP countries (Capulong et al. 2000).

#### *End of waves: Financial crises*

Rapid debt accumulation initially supported growth but was often associated with financial crises.

**Triggers.** Financial crises have often been triggered by shocks that raised investor risk aversion, risk premiums and borrowing costs, followed by a sudden stop of capital flows, or by growth slowdowns that eroded debt sustainability (Frankel and Rose 1996; Easterly 2002; Kaminsky and Reinhart 2000; Summers 2001). In the first

## BOX 4.1 Similarities and differences between the previous three waves *(continued)*

wave, around the global recession of 1982, deteriorating risk sentiment restricted access to new borrowing in LAC and SSA. In the second wave, capital flows to EMDEs stalled or reversed in the global slowdown of 1998, amid a loss of investor confidence following the East Asian and Russian crises (Kaminsky 2008; Kaminsky and Reinhart 2001). In the third wave, banking system liquidity dried up in the 2008 global financial crisis, interrupting cross-border lending in ECA. Domestic political events also contributed to some crises, for example in Turkey and Argentina in the third wave (Ozatay and Sak 2002).

**Types of financial crises.** Many crises began with sharp depreciations and capital outflows, which were occasionally the precursor to sovereign debt crises. Large depreciations increased debt service on dollar-denominated debt and led to surges in inflation. Sudden stops or reversals in capital flows complicated debt rollover. In all three waves, countries that slid into crises had sizable vulnerabilities, such as large external, short-term foreign currency-denominated or variable-rate debt; low reserves; pegged exchange rates; and weak monetary, fiscal, and prudential frameworks.

**Macroeconomic impact.** Debt buildup in the first three waves was often followed by crises or stagnation, especially when the debt buildup was predominantly driven by sovereign debt. Currency depreciations were often large, especially during the first and second wave, and triggered sharp spikes in inflation and deteriorating debt-to-GDP ratios when debt was denominated in dollars. That said, there were considerable differences in the severity of macroeconomic outcomes between the waves, as discussed below.

**Fiscal impact.** Financial crises were often fiscally costly. In the first wave, defaulting governments in LAC lost capital market access for many years. In the second and third waves, governments had to support ailing banks in recognition of implicit guarantees for financial systems.[1] 90 percent of banking crises have required bank restructuring, and roughly 60 percent have led to the nationalization of one or more banks.

**Policy responses.** In all waves, the countries suffering crises implemented policies that helped build resilience to future financial stress. In the first and second waves, LAC and EAP governments took measures to increase reserves and limit future buildups of external debt. Many moved towards inflation targeting and flexible exchange rates. In the second and third waves, EAP and ECA governments eventually strengthened bank supervision, corporate bankruptcy laws and fiscal frameworks. However, progress has varied across countries, with some remaining more vulnerable to shocks than others.

### Differences across the waves

The three waves differed in the most active borrowing sector and their regional focus; the financial instruments involved; the speed of resolution of crises; and their macroeconomic impact.

#### *Borrowing sector and region*

In the first wave, borrowing was primarily accounted for by the public sector in LAC and SSA (Figure 4.1.2).[2] In these two regions, governments ran persistent fiscal deficits which were used to fund current expenditure in some countries, as well as investment. In the second wave, both the private sector (EAP) and the public sector (ECA, LAC) played a role. In the third wave—with fewer countries with large debt runups than in the previous two waves—the private sector in ECA was the primary source of borrowing. Sovereign debt levels in most EMDEs were either muted or falling in the third wave. Governments in EAP (second wave) and ECA (third wave) typically had sound fiscal positions in the run-up to crises. As a result of these shifts, the share of the public sector in external borrowing fell from a high of 95 percent in 1989 to 53 percent in 2018.

#### *Financial instruments and debt resolution*

**Financial instruments.** The source of credit in each wave also evolved. In the first wave, sovereigns borrowed from the official sector through bilateral lending and multilateral loans, as well as from commercial banks via the syndicated loan market (lending from commercial banks accounted for around one-third of total external

[1] For a global sample, the average cost of government intervention in the financial sector during crises in 1990-2014 amounted to 9.7 percent of GDP, with a maximum of 55 percent of GDP (IMF 2016a). The average cost of government intervention in public sector enterprises during 1990–2014 amounted to about 3 percent of GDP and the average cost of the realization of contingent liabilities from public-private partnerships was 1.2 percent of GDP (Bova et al. 2016).

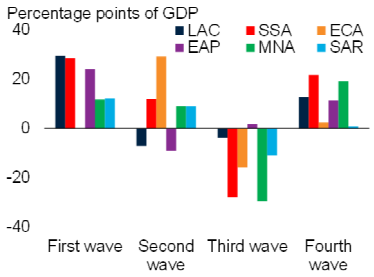
[2] The first and third waves were global in the sense of total EMDE debt rising whereas the second wave had a narrower regional focus. During the first wave, EMDE government debt rose sharply; similarly, during the third wave, EMDE private debt rose sharply, driving up EMDE total debt (Figure 4.1). In contrast, during the second wave, EMDE government debt declined while EMDE private debt, resulting in a limited overall increase in total EMDE debt over the course of the second wave.

## BOX 4.1 Similarities and differences between the previous three waves *(continued)*

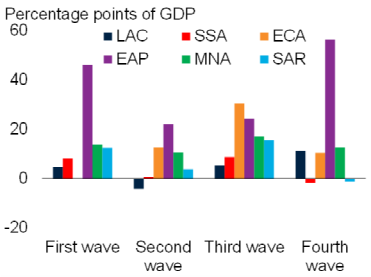
### FIGURE 4.1.2 Changes in debt by sector and region

*Whereas earlier waves were concentrated in a few regions, the debt buildup in the fourth wave has been broad-based. Like the third wave, private and government sectors accounted almost equally for external borrowing.*

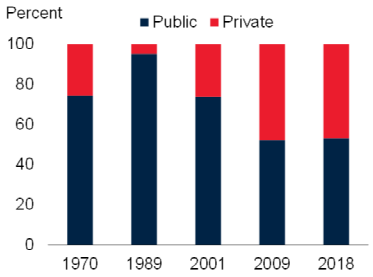
**A. Change in government EMDE debt, by region**




**B. Change in private EMDE debt, by region**




**C. Composition of external debt in EMDEs**




Source: World Bank.
A.B. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.
C. Long-term external debt only.
Click here to download data and charts.

public debt in EMDEs by 1980-81). The introduction of Brady bonds in the 1990s spurred the development of sovereign bond markets, and in the 2000s, local bond markets deepened, allowing governments to obtain long-term finance, including from foreign investors. In the ECA region, the private sector accessed cross-border lending by European banks, whose subsidiaries and branches were based in ECA countries but headquartered in advanced economies. As a result, there has been a shift from international debt to domestic debt, and a move toward debt securities, including local currency bonds.

**Debt resolution: speed, scope, and mechanisms.** The speed of resolution largely depended on whether the debtors were in the public or private sector. The difficulty of debt restructuring led to gradual progress in debt resolution and restructuring mechanisms.

- *Slow government debt restructuring.* In the first wave, the resolution of widespread sovereign debt defaults in LAC and SSA was slow, given Paris Club countries' concerns about advanced economy bank solvency and the lack of a well-defined restructuring mechanism (Callaghy 2002).[3] In the second wave, debt resolution was again prolonged for sovereign debt crises in Turkey and Argentina, which required IMF assistance. Restructuring after Argentina's 2001 debt default was not completed until many years later.[4]
- *Faster private debt resolution.* In the second wave, private sector debt in EAP was resolved quite quickly, with speedy support from the public sector through bank recapitalization and other support schemes, often with IMF assistance. Non-financial corporate debt resolution, particularly among larger conglomerates, was much slower than for the financial sector, and non-performing loans remained elevated for several years after the crisis (Kawai 2002). In the third wave, globally accommodative policies; IMF assistance; the European Bank Coordination ("Vienna") Initiative in 2009; and other banking system support together helped stem currency and banking crises.
- *New resolution mechanisms.* At the start of the first wave, there was little consideration for borrowers' ability to service their debt. Over time, creditors moved toward acceptance of some debt reduction. This paved the way for the conversion of syndicated

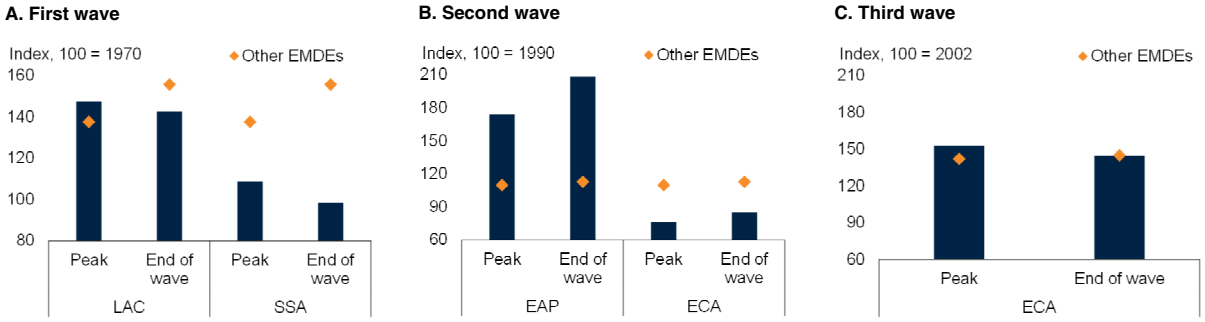
[3] Borensztein and Panizza (2009) find that the reputational and economic cost of sovereign debt defaults is significant although short-lived, in part because crises precede defaults and defaults tend to happen at the trough of the recession.

[4] Argentina arranged a first restructuring of its debt in 2005, which was accepted by about three-quarters of bond holders (Hornbeck 2013). A second restructuring was agreed in 2010, which two-thirds of the remaining bondholders accepted. 7 percent of bondholders were "holdout" creditors, who eventually reached a settlement in 2016.

## BOX 4.1 Similarities and differences between the previous three waves *(continued)*

### FIGURE 4.1.3 GDP per capita in EMDEs during the four waves

*In the first wave of debt, countries in LAC and SSA saw prolonged stagnation in per capita growth after debt crises erupted. In the second wave, rapid growth in EAP was interrupted by the Asian financial crisis in 1998 but growth soon recovered. In the third wave, growth in ECA was robust throughout the period but fell in the final year when the crisis hit.*




Source: World Bank.

Note: Data are per capita GDP level (at 2010 prices and exchange rates) in each region at the pre-crisis peak and the end of the wave in each region, indexed to the start of the wave. For LAC and SSA in the first wave, the peak was in 1980; in EAP and ECA in the second wave it was in 1997; and in ECA in the third wave it was in 2008. The orange diamonds in Figures A-C show the average for all EMDEs excluding the highlighted regions in each chart, for the corresponding years. EAP = East Asia and Pacific, ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; SSA = Sub-Saharan Africa.

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loans to Brady bonds, and later the HIPC and MDRI debt relief initiatives for official debt in low-income countries. Collective action clauses (CACs) were later introduced to facilitate sovereign debt restructuring with multiple bondholders (Eichengreen, Kletzer, and Mody 2003). For private debt, the Insolvency and Creditor Rights Standard developed best practices for national insolvency systems (Leroy and Grandolini 2016). There has been a substantial improvement in insolvency protections over the course of the three waves (World Bank 2019a).

### *Macroeconomic impact*

During the first three waves, financial crises did substantial economic damage, but the severity varied between the waves, and across regions.

**Output cost.** In the first wave, LAC suffered a lost decade of stagnant per-capita incomes following the 1982 crisis (Figure 4.1.3). Per capita incomes in SSA fared even worse, with GDP per capita declining for many years. Sovereign debt crises in Turkey and Russia during the second wave also generated severe output losses. In contrast, in the second wave, EAP countries with predominantly private debt buildups experienced only a temporary slowdown from the East Asia crisis. In the third wave, ECA countries with predominantly private debt buildups saw large but short-lived declines in output.

**Currency depreciations.** Depreciations were substantially larger and more common in the first and second waves, when exchange rates were mostly fixed or crawling pegs, and often had to be abandoned in the face of speculative attacks. By the third wave, more countries had flexible exchange rates, reducing the likelihood of substantial overvaluations to begin with.

**Inflation.** Inflation following crises rose more in the first wave, and to a lesser extent, in the second. In part, this was due to larger depreciations in these waves. It also reflected subsequent improvements in monetary frameworks—a move toward inflation-targeting and independent central banks that helped anchor inflation expectations (Ha, Kose, and Ohnsorge 2019).

Ohnsorge 2019; Turner 2002).[5] Especially in the largest EMDEs, domestic bond issuance has risen rapidly. Foreign portfolio investors are also becoming more active in local bond markets, accounting for a growing share of local currency-denominated sovereign bonds.

The current wave has also seen a significant increase in nonbank financial intermediation in EMDEs. These nonbank financial institutions have expanded rapidly in a number of EMDEs, particularly large economies.

**Vulnerabilities.** Over the course of the fourth wave, vulnerabilities have once again grown (Ruch 2019). Since 2010, EMDE total external debt has risen to 26 percent of GDP on average in 2018, reflecting sizable and persistent current account deficits. In 2018, 55 percent of EMDEs had weaker current account balances than in 2010; 76 percent ran current account deficits (compared with 69 percent in 2010); and 44 percent had current account deficits in excess of 5 percent of GDP (Figure 4.4). The number of countries with fiscal deficits has also risen.

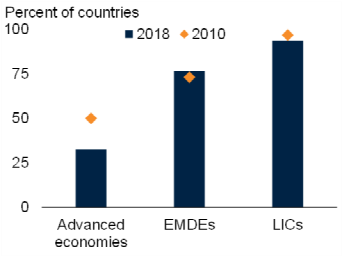
In addition, both government and private debt have shifted toward riskier forms in many EMDEs, with a rise in the share of debt that is held by non-residents (for governments), is denominated in foreign currency (for corporates) and is on non-concessional terms. A greater share of corporate debt than before the global financial crisis is held by firms with riskier financial profiles, as supportive financing conditions have allowed firms to issue more debt with weaker credit quality (Beltran and Collins 2018; Feyen et al. 2017; IMF 2015a). EMDE financial markets are now more tightly integrated into the global financial system, which could in some circumstances facilitate the contagion of global financial shocks both to foreign currency and, to a lesser extent, local currency debt markets.

[5] However, such a switch may bring other risks, as countries switching from external to domestic debt could be trading a currency mismatch for a maturity mismatch (Panizza 2008; Broner, Lorenzoni and Schmukler 2013). Nominal interest rates on domestic debt tend to be higher than on external debt (IMF 2015a).

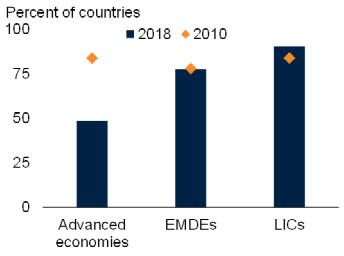
## FIGURE 4.4 The fourth wave: Vulnerabilities and use of borrowed funds

*The fourth wave has seen growing vulnerabilities in EMDEs, with a rise in both domestic and external debt as countries have run persistent current account and fiscal deficits. The composition of debt has shifted, with a greater share held by non-residents and a rise in non-concessional debt. Public investment has fallen sharply in EMDEs, suggesting that rising debt is being used for current spending, rather than growth-enhancing investment, despite a fall in interest payments.*

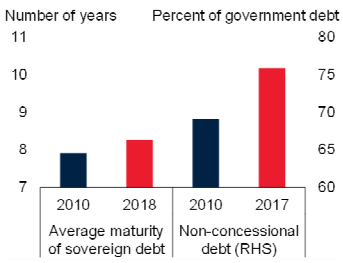
**A. EMDEs with current account deficits**



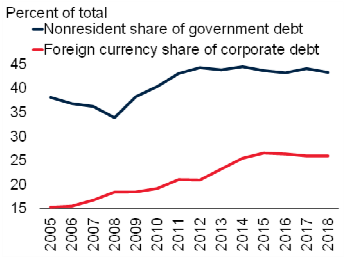

**B. EMDEs with fiscal deficits**



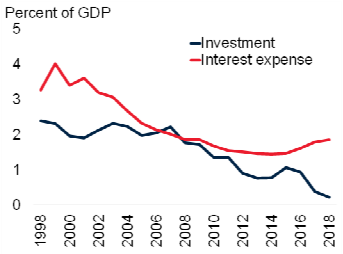

**C. Average maturity and non-concessional debt in EMDEs**



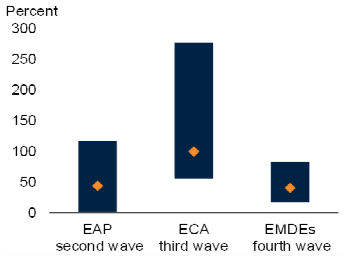

**D. Non-resident share of government debt, foreign currency share of corporate debt**




**E. Public expenditures in EMDEs**




**F. Cumulative change in house prices, selected country groups**




Source: Bank for International Settlements; International Monetary Fund; OECD; World Bank.
C. Median of 65 EMDEs for maturity and 122 EMDEs for non-concessional debt
D. Non-resident share of government debt is average for 45 EMDEs, with a smaller sample size for earlier years. Foreign currency share of corporate debt of average for 21 EMDEs.
F. Chart shows the cumulative percentage increase in house prices over the course of a wave, prior to the crisis. The range covers 1990-97 for EAP, 2001-2008 for ECA, and 2010-18 for EMDEs. EAP contains three countries, ECA contains 5, and EMDEs contains 31 countries. Orange diamonds denoted the median, and blue bars the interquartile range of country groups.
Click here to download data and charts.

## BOX 4.2 The fourth wave

*Since 2010, another wave of debt accumulation has been building and total debt in EMDEs has reached almost 170 percent of GDP, on average, in 2018—a record high—from 114 percent of GDP in 2010. This increase was accompanied by shifts toward borrowing from non-traditional creditors and financial institutions, as well as capital markets. As with previous waves, the fourth wave has seen mounting vulnerabilities for EMDEs.*

The fourth wave of debt buildup among EMDEs began in 2010. It was broad-based across EMDE regions and borrowing sectors. The debt buildup has been accompanied by a decade of anemic growth in EMDEs (Kose and Ohnsorge 2019). Changes in advanced-economy financial sectors also propelled shifts in creditors to EMDE governments and corporates. This box examines the fourth wave by addressing the following questions.

- How did debt evolve in the fourth wave?
- Which factors have contributed to debt accumulation during the fourth wave?

### Evolution of debt

**Broad-based public and private debt buildup**. Since 2010, another wave of debt accumulation has been underway. The buildup has been especially fast in EMDEs, with government debt increasing in tandem with mounting private sector debt. As a result, total debt in EMDEs has risen to almost 170 percent of GDP, on average, in 2018—a record high—from 114 percent of GDP in 2010 (Kose et al. 2019). The debt-to-GDP ratio has risen in all EMDE regions with the exception of SAR, where it has been broadly flat, and in 80 percent of EMDEs, with more than one-third seeing an increase of at least 20 percentage points of GDP.[1] Excluding China, where corporate debt has soared post-crisis, total EMDE debt has risen to a near-record 107 percent of GDP in 2018. The pace of increase in EMDE debt excluding China has slowed since 2016, with a modest decrease in private sector debt offsetting a small increase in government debt. However, this masks substantial variation between regions, with large increases in debt-to-GDP ratios in SSA and LAC and declines in MNA and ECA.

- *Government debt.* Since 2010, EMDE government debt has risen, on average, by 12 percentage points of GDP to 50 percent of GDP at end-2018. Over this period government debt-to-GDP has risen in three-quarters of EMDEs and by at least 10 percentage points in almost 60 percent of them. Government debt saw a marked increase among commodity-exporting countries in the aftermath of the commodity price plunge in 2014 (particularly oil prices), as fiscal deficits surged amid declining revenue and large fiscal stimulus (World Bank 2018c).
- *Private debt.* The private sector has also rapidly accumulated debt since the global financial crisis, particularly in China. About two-fifths of EMDEs witnessed private sector credit booms in at least one year during 2011-18 (Ohnsorge and Yu 2016; World Bank 2016a).[2] The rise in debt in China has been focused in a few sectors, notably the real estate, mining, and construction sectors, and among state-owned enterprises.

**Shifts to riskier debt.** Both government and private debt have shifted toward riskier funding sources in many EMDEs, making these countries more vulnerable to a deterioration in global investor sentiment (Figure 4.2.1).

- *Government debt.* The increase in government debt has been accompanied by a growing share of non-resident investors (to 43 percent in 2018) and an increasing reliance on non-concessional terms. Sovereign ratings have also been downgraded for many EMDEs since 2010. This also increases the fragility of EMDE banks where there is some evidence that exposures to sovereigns have increased (Feyen and Zuccardi 2019).
- *Private debt.* On average, across EMDEs with available data, foreign currency-denominated corporate debt has risen from 19 percent of GDP in 2010 to 26 percent of GDP in 2018, although its share of total corporate debt remained around 40 percent over this period (IIF 2019b). By end-2018, one third of these EMDEs had foreign currency denominated corporate debt above 20 percent of GDP. In addition, a greater share of corporate debt

Note: This box was prepared by Peter Nagle.

[1] Total debt has risen particularly rapidly in Argentina, Cambodia, Chile, and China. Turkey stands out as having the third fastest increase in private sector debt after Cambodia and China. Among low-income countries, Mozambique, The Gambia, and Togo and have seen the largest increases in debt.

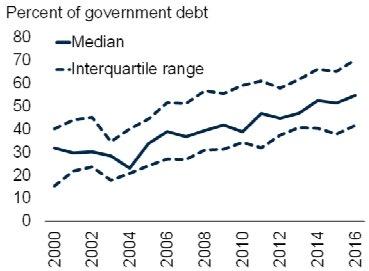
[2] About half of all credit booms are followed by at least a mild deleveraging within three years (Ohnsorge and Shu 2016).

## BOX 4.2 The fourth wave (*continued*)

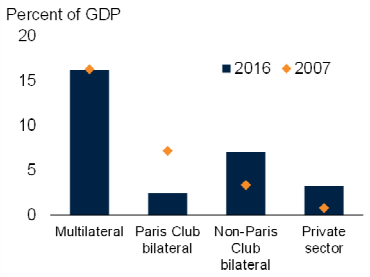
### FIGURE 4.2.1 The fourth wave: Debt developments

*Low-income countries have seen a sharp increase in borrowing from non-Paris club bilateral sovereign lending and non-concessional lending. As EU- and U.S.-headquartered banks have downsized their EMDE operations, cross-border bank lending to EMDEs shifted to EMDE-headquartered banks. EMDE corporate and sovereign borrowers have increasingly turned to capital markets to raise new debt.*

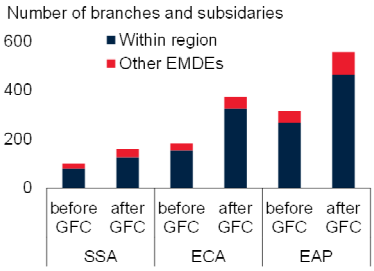
**A. Share of non-concessional debt in LICS**



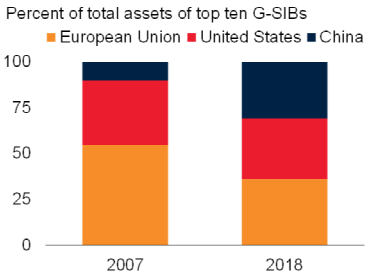

**B. Creditor composition of LIC external public debt**



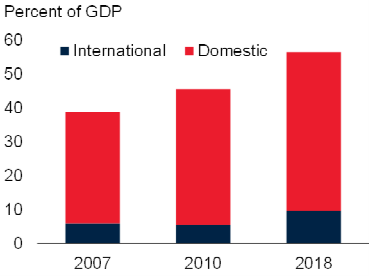

**C. Pan-regional banks**



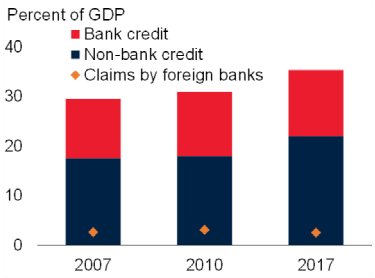

**D. Global assets of 10 largest G-SIBs by bank domicile**




**E. Debt securities outstanding**




**F. Claims on the official sector**




Source: Bank for International Settlements; Claessens and van Horen 2014; International Monetary Fund; World Bank.
A. Dashed blue lines denote the interquartile range, while solid blue line is the median. Includes 30 low-income countries and excludes Somalia, South Sudan, and Syria due to data restrictions.
B. GDP-weighted average across 32 low-income countries. Bilateral includes public and publicly guaranteed (PPG) loans from governments and their agencies (including central banks), loans from autonomous bodies, and direct loans from official export credit agencies. Multilateral includes PPG loans and credits from the World Bank, regional development banks, and other multilateral and intergovernmental agencies. It excludes loans from funds administered by an international organization on behalf of a single donor government. Private include PPG bonds that are either publicly issued or privately placed; PPG debt from commercial bank loans from private banks and other private financial institutions; as well as export and supplier credits.
C. GFC = global financial crisis. Based on annual bank statements; before the GFC = 2008 or 2009 depending on data availability; after GFC = 2018 or latest data available.
D. Based on the Financial Stability Board 2018 list of global systemically important banks (G-SIBs).
E. Sample includes Argentina, Brazil, Colombia, India, Indonesia, Malaysia, Mexico, Philippines, Russia, South Africa, Thailand and Turkey.
F. BIS estimates of the claims by foreign banks on official sector: sample includes Argentina, Brazil, Chile, Colombia, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Poland, Russia, Thailand, Turkey, Republic of Korea, and South Africa
Click here to download data and charts.

than before the global financial crisis has been owed by firms with riskier financial profiles, as supportive financing conditions have allowed firms to issue more debt with weaker credit quality (Beltran and Collins 2018; Feyen et al. 2017).

**LIC government debt.** In LICs, debt has also shifted toward non-concessional, non-Paris Club bilateral creditors, notably China, as well as commercial creditors over the past decade (World Bank 2018b; World Bank and IMF 2018a). In 2016, non-Paris Club debt accounted for more than a fifth of the median LIC's external debt, and about 13 percent of their public debt, raising concerns about debt transparency as well as debt collateralization (Essl et al. 2019).

## BOX 4.2 The fourth wave (*continued*)

Estimates of current public debt levels in LICs also suffer from limited debt transparency, including issues related to contingent liabilities, state-owned enterprise debt and PPP transactions, and the assets held by LIC governments. These data limitations are especially acute for debt owed to commercial and non-Paris Club creditors. Poor data coverage can give rise to unexpected sudden increases in debt, for example when the debt of loss-making SOEs migrates onto the books of the central government. For example, in Mozambique and the Republic of Congo, the revelation of unreported debt led to large upward revisions to official debt figures, which resulted in debt distress (IMF 2018a). Only a third of the 59 countries eligible for International Development Association borrowing report private sector external debt statistics (World Bank and IMF 2018b).

**Changes in the composition of creditors.** Since the global financial crisis, borrowing by EMDEs has shifted toward capital markets and regional banks, and away from global banks. Bond issuance has allowed firms to access finance when bank credit supply tightened or at different terms from bank loans (Cortina, Didier, and Schmukler 2016). The role of regional EMDE banks has also grown as large international banks have retrenched from EMDEs in the aftermath of the global financial crisis (BIS 2018; Feyen and Gonzalez de Mazo 2013). As large international banks retrenched, cross-border bank lending to EMDEs shifted to EMDE-headquartered banks, which greatly expanded their regional presence, most notably in SSA (Cerutti and Zhou 2017, 2018; IMF 2015b; World Bank 2018c).

Chinese banks accounted for two-thirds of EMDE-to-EMDE lending between 2013 and 2017 and for most of the doubling in cross-border claims on SSA economies in the same period, to over 10 percent of GDP on average (Cerutti, Koch, and Pradham 2018; Dollar 2016). Other EMDE banks have also increased their presence in EMDEs within their respective regions. A notable exception has been the Middle East and North Africa region, where declining current account surpluses resulting from weaker oil revenues have reduced the region's ability to recirculate savings from high-income oil exporters to lower-income EMDEs with persistent current account deficits (World Bank 2019b).

In SSA, banks headquartered in Togo, Nigeria and South Africa have expanded rapidly to other EMDEs in the region (Arizala et al. 2018). In ECA, Russian banks initially expanded post-crisis within the region, as Western European banks withdrew.[3] LAC was an exception, with a growing role of domestic banks, rather than of banks based in other countries in the region, as domestic banks acquired assets from exiting foreign lenders. The regional expansion of EMDE banks has yet to reach the scale of pre-crisis cross-border activity of lenders from the advanced economies.

Finally, the domestic institutional investor base has continued to grow in EMDEs, offering the prospect of a potentially stabilizing pool of domestic savings. Assets of pension funds and insurance companies had risen to 46 percent of GDP by end-2016, on average, in EMDEs. Such assets remain equivalent to only about half of the assets of the bank and non-bank financial system (World Bank 2019c).[4]

### Contributing factors to debt accumulation

**Evolving financial instruments.** The latest wave has been associated with a growing importance of domestic debt, while external debt grew more slowly than in the most affected regions during previous waves. The fourth wave has seen rising demand for EMDE bonds from international investors such as asset managers (Shin 2014). Domestic bond issuance has risen sharply, particularly in large EMDEs, while exceptionally long-term (50- and 100-year) international bonds have been issued by some EMDEs, including Mexico in 2010, and Argentina in 2017. Over the past decade, more than 20 EMDEs accessed international capital markets for the first time. New frontier market bond indices, such as J.P. Morgan's NEXGEM launched in 2011 or MSCI's Frontier Market Index launched in 2007, have facilitated international capital market access and broadened the investor base for countries which thus far only had intermittent capital market access.

[3] For example, example, Russia's largest lender, Sberbank, acquired Volksbanken's VBI Eastern European operations in 2012.

[4] Data on assets of pension funds and insurance companies are only available for 22 EMDEs. Foreign institutional investors' role in EMDE financial markets has also grown but in some sectors remains small. For example, in just under 1000 infrastructure projects since 2011, the share of institutional investors has more than tripled but still accounts for only 0.7 percent of the average project value (World Bank 2018a). Some institutional investors in EMDEs have been shown to behave procyclically, leaving EMDE financial markets during times of stress rather than acting as stabilizing investors with deep pockets (Raddatz and Schmukler 2012).

## BOX 4.2 The fourth wave (*continued*)

The share of corporate debt financed by debt securities on average rose from 16 percent to 25 percent of total lending between end-2007 and end-2018. This included issuance on both international and domestic debt markets. The volume of international debt securities issued by EMDEs increased more than three times between 2007 and 2018. Domestic debt issuance excluding China increased from 33 percent of GDP in 2007 to 47 percent of GDP in 2018.

EMDE sovereign borrowers are also relying more heavily on capital markets. From 2007 to 2017, debt securities issued by EMDE governments increased by 4.4 percentage points of GDP on average, to 22 percent of GDP. In SSA Eurobond issuance has grown, with several countries tapping this market for the first time. Sovereign debt issuance has grown particularly rapidly in domestic bond markets, especially in EAP (G20 IFAWG 2018). In some EMDEs, the share of nonresident investors in local currency sovereign bond holdings exceeds 30 percent, which makes these economies more vulnerable to sudden shifts in investor confidence (G20 IFAWG 2018).

New financing vehicles such as infrastructure bonds and green finance bonds have stimulated lending to specific EMDE sectors where banks used to be the primary source of funding (FSB 2018a; McKinsey Global Institute 2018).[5] However, infrastructure financing, in general, has declined in EMDEs following the sharp reduction in cross-border lending and stricter post-crisis regulations in the financial sector (G20 2013; Kose and Ohnsorge 2019).[6]

**Very low interest rates, weak growth.** Interest rates have been at very low levels throughout the fourth wave as a result of unconventional monetary policy among central banks, including negative policy rates and quantitative easing. This has encouraged an aggressive search for yield, large capital flows to EMDEs, and a sharp fall in bond spreads. Around one quarter of sovereign and corporate bonds in advanced economies—and some foreign-currency bonds issued by Poland, and Hungary—currently trade at negative yields.[7] Spreads on emerging market debt both for corporate and sovereign bonds reached all-time lows in 2017, boosting borrowing. Average spreads on corporate bond issuance have fallen for all EMDEs, including LICs. Spreads have also fallen for lower rated corporate bonds.

An additional reason for rapid debt accumulation has been a sharp slowdown in growth over the course of the fourth wave that eroded EMDE fiscal positions and resulted in additional borrowing to maintain current spending levels. Government debt levels in commodity exporters surged following the collapse in commodity prices, particularly after the oil price plunge in 2014, driving much of the increase in EMDE debt (excluding China) in the second half of the current wave (World Bank 2018a).

**Growing non-bank financial intermediation.** The current wave has also seen a significant increase in shadow banking activities in EMDEs. Shadow banking refers to non-bank financial intermediation that takes place outside of the regulated financial system and may provide credit to riskier borrowers who often lack access to bank credit. Shadow banking systems, which were small before the global recession, have expanded rapidly in a number of EMDEs, particularly in large economies such as China and India (IMF 2014). In these two countries, assets of non-bank financial institutions now represent over a third of total financial system assets. In China alone, this share has more than doubled over the last decade, and the size and complexity of its non-bank financial sector is becoming comparable to those of advanced economies (Ehlers et al. 2018).

A decade of lighter regulation of non-banks than banks, combined with rapid growth, has increased maturity mismatches and credit risks in non-banks (IMF 2018c). Financial stress in non-banks may quickly propagate to the rest of the financial system, owing to its interconnectedness with banks (FSB 2017, 2018b, 2019; Pozsar et al. 2013). This has been illustrated by a recent shift toward stricter regulations and supervision of non-banks in China and a default of one of the largest non-bank lenders in India, which have already created tighter financial conditions for the private sector in those economies (IMF 2019b).

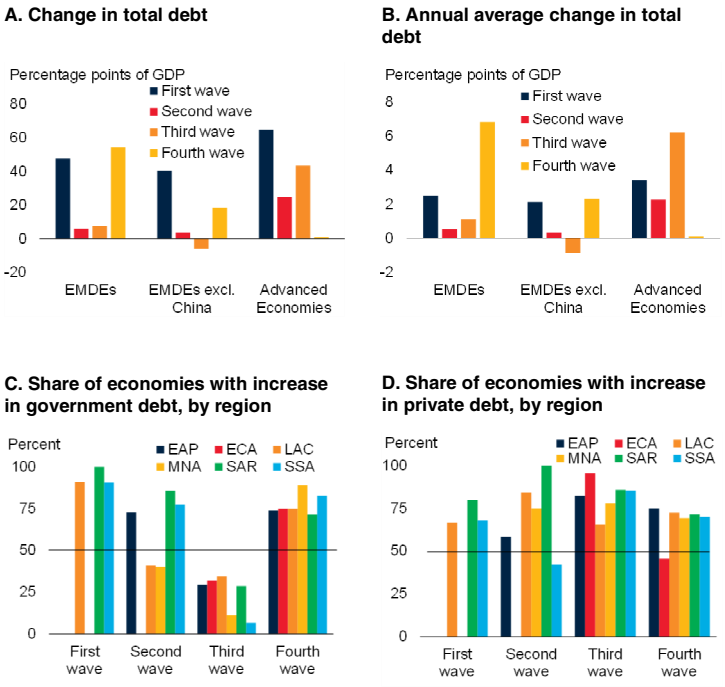
[5] In advanced economies, financial instruments that were widely used before the crisis have regained popularity. Especially in the United States, leveraged loan issuances—the majority of which are now covenant-lite with lesser protections for creditors, and which are predominantly held in Collateralized Loan Obligations (CLOs) and loan funds—have risen again above elevated pre-crisis levels. Concerns have been raised whether CLO prices are fully aligned with risks (Domanski 2018; FSB 2019).

[6] Grants and concessional loans are the primary source of infrastructure finance in LICs, with bank lending providing a complementary source of funding only in a small number of countries (Gurara et al. 2017).

[7] In the two EMDEs with negative yielding sovereign bond issuances, government, household and corporate debt have risen only marginally (at most 7 percentage points of GDP) over the past decade.

**FIGURE 4.5 Comparison of features of fourth wave and earlier waves: Debt**

*The fourth wave has seen the largest and fastest increase in debt-to-GDP ratios among EMDEs. It has also been the most broad-based increase in debt across regions and borrowing sectors.*




Source: . International Monetary Fund; World Bank.
Note: First wave: 1970-89; second wave: 1990-2001; third wave: 2002-09; fourth wave: 2010 onwards.
A. Change in total debt-to-GDP ratio over the source of each wave.
B. Average annual change calculated as total increase in debt-to-GDP ratio over the duration of the wave, divided by the number of years in a wave.
C.D. Sample includes 142 EMDEs. Data show the share of economies where the debt-to-GDP ratio increased over the duration of the wave. Regions are excluded if country-level data are available for less than one-third of the full region.
Click here to download data and charts.

**Use of debt.** In the current wave of debt, there have been signs that government debt is being used for "less efficient" spending rather than on productive investment in physical or human capital that could boost potential growth in EMDEs. Public investment in EMDEs fell from an average of 2.1 percent of GDP in 2002-09, to 0.9 percent in 2010-18 (IMF 2019c). Among commodity exporters, declining tax revenues following the commodity price plunge in 2014-16 widened fiscal deficits and raised debt despite lower investment (World Bank 2018a). Meanwhile, house prices have risen sharply in some EMDEs, suggesting that some of the rise in private debt has financed residential construction, which does not yield export earnings.

## Differences from the previous three waves

The fourth wave has featured the largest, fastest and most broad-based debt accumulation in EMDEs yet. In contrast to earlier waves, government debt has risen in tandem with mounting private sector debt. Compared to the first and third waves—when advanced-economy debt accumulation outpaced EMDE debt accumulation—the fourth wave has been accompanied by near-stable advanced-economy debt-to-GDP ratios. However, some other developments have been more reassuring. During the latest wave, there have been reforms that have made the international financial system more resilient and enlarged the global financial safety net. Many EMDEs have improved their macroeconomic and prudential policy frameworks over the past two decades.

**Largest, fastest, and most broad-based wave yet.** Including or excluding China, the annual increase in EMDE debt since 2010 (almost 7 percentage points of GDP, on average) has been larger, by some margin, than during the first three waves (Figure 4.5). In contrast to previous waves, which were largely regional in nature, the fourth wave was global. Total debt has risen in more than 70 percent of EMDEs in all regions—previous waves saw higher rates of increase within specific regions, but not across all regions simultaneously. More than one-third of EMDEs have seen an increase in debt of at least 20 percentage points of GDP. Finally, the majority of debt accumulation episodes have featured combined government and private debt buildups—in contrast to the previous three waves when the majority of debt accumulation episodes were either predominantly government or predominantly private episodes.

**Stronger policy frameworks.** Many EMDEs learnt the lessons from crises in the previous waves and adopted reforms designed to improve resilience. These include greater exchange rate flexibility, and more robust monetary policy frameworks and central bank transparency—since 1999, the number of EMDEs who have adopted inflation

targeting has increased from 3 to 24 (Figure 4.6). EMDEs have also made reforms to fiscal frameworks, with the number of countries with fiscal rules rising from 12 in 1999 to 62 in 2018, and substantial improvements in debt management policies and tools (World Bank 2013). Foreign exchange reserves to debt have risen markedly across EMDE regions, although they have fallen from the highs of 2009-10. More EMDEs are using macroprudential tools, particularly placing stricter limits on foreign exchange positions. Bankruptcy rights have also been strengthened, but there is still considerable room for improvement (Kose and Ohnsorge 2019).

**Financial regulatory reforms.** Financial sector reforms implemented since the global financial crisis are also increasing resilience (BIS 2018). The G20 global financial regulatory reform agenda has implemented major financial reforms since the global financial crisis, including the international adoption of the Basel III capital and liquidity standards (FSB 2018c).

Global financial safety nets have been significantly expanded, with resources available in country-specific, regional and multilateral financial safety nets tripling between 2007 and 2016, including through the creation of regional financing arrangements (RFAs), expanded IMF resources, and increased international reserve holdings (IMF 2018c).[6]

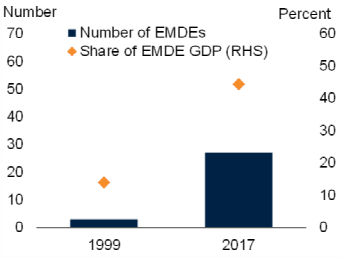
**Stable debt in advanced economies.** In contrast to the first and third waves—when advanced-economy debt accumulation outpaced EMDE debt accumulation—the fourth wave of EMDE debt accumulation was accompanied by near-stable advanced-economy debt-to-GDP ratios. Advanced economies have also seen pronounced private-sector deleveraging which reduced the share of private debt in total debt during the fourth wave.

[6] The global financial safety net consists of 1) self-insurance against external shocks using foreign reserves or fiscal space at national level, 2) bilateral are swap lines among countries, 3) regional financing arrangements, and 4) the global financial backstop provided by the IMF (Brueggemann et al. 2018).

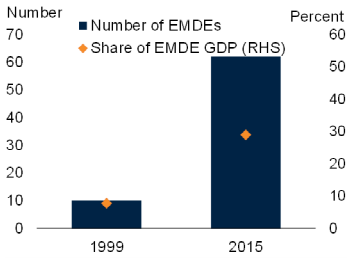
## FIGURE 4.6 Comparison of fourth wave and earlier waves: Policies and institutions

*Many EMDEs learned lessons from crises in the previous waves and adopted policies to improve resilience. These include more robust monetary and exchange rate policy frameworks, fiscal rules, macroprudential tools, higher foreign exchange reserves relative to external debt, and improved bankruptcy processes.*

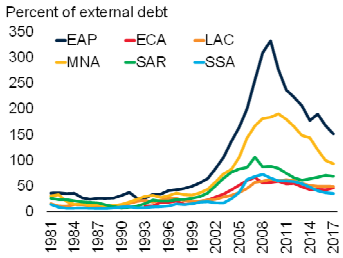
**A. EMDEs with inflation targeting central banks**



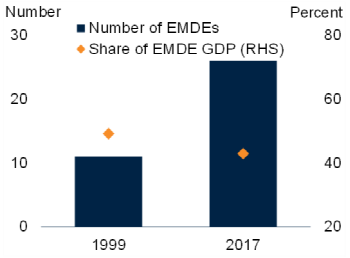

**B. EMDEs with fiscal rules**



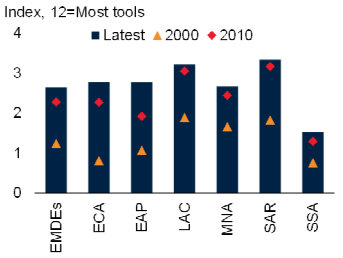

**C. Foreign reserves in EMDE regions**



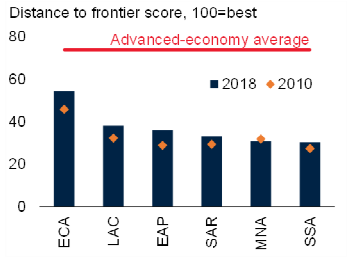

**D. EMDEs with flexible exchange rates**




**E. Macroprudential policy in EMDEs**




**F. Bankruptcy rights protection in EMDEs**




Source: Cerutti, Claessens, and Laeven (2017); Dincer and Eichengreen (2014); Ha, Kose, and Ohnsorge (2019); Huidrom et al. (2019); International Monetary Fund; Kose et al. (2017); World Bank.

A. Inflation targeting as classified in the International Monetary Fund's Annual Report of Exchange Arrangements and Exchange Restrictions.

B. An economy is considered to be implementing a fiscal rule if it has one or more fiscal rules on expenditure, revenue, budget balance, or debt.

D. An economy is considered to have a flexible exchange rate if it is classified as "Floating" or "Free Floating" in the International Monetary Fund's Annual Report of Exchange Arrangements and Exchange Restrictions.

E. Sample includes 123 EMDEs. Unweighted average of the Macroprudential Policy Index of Cerutti, Claessens, and Laeven (2017). The Macroprudential Policy Index measures the number of tools used by authorities and is based on a simple sum of up to 12 including, but not limited to, countercyclical capital buffers and loan-to-value ratios.

F. Distance to frontier score for strength of insolvency resolution. A higher index indicates reforms that improve the business climate. EAP, ECA, LAC, MNA, SAR, and SSA include 22, 22, 32, 19, 8, and 46 economies, respectively. Advanced economies include 36 economies. Based on World Bank Doing Business reports for 2010, and 2019.

Click here to download data and charts.

## BOX 4.3 Debt and crises

*This box conducts an econometric exercise to illustrate the extent to which debt accumulation can increase the likelihood of a crisis. A substantial rise in either government or private debt is associated with a significantly higher probability of a crisis occurring in the following year. A combined increase in government and private debt had a particularly strong association with the probability of a currency crisis in the next year. A high share of short-term debt, or large debt servicing costs, similarly raised the likelihood of a crisis. Countries that experienced crises typically had major institutional shortcomings, including debt and fiscal mismanagement, inadequate banking regulation, poor corporate governance, and political uncertainty.*

The event study suggests that episodes of debt accumulation that were accompanied by crises often featured larger debt buildups than episodes without crises. This box quantifies the effect of debt accumulation on the likelihood of financial crises using an econometric analysis. Specifically, it answers the following questions.

- What factors have been found to correlate with financial crises?
- What factors are associated with an increased likelihood of crises?
- What were the common features of crisis episodes?

### Empirical literature

The econometric exercise here builds on an extensive literature on early warning models.[1] The first generation of early warning models, in the 1980s and 1990s, aimed at predicting currency crises and largely focused on macroeconomic and financial imbalances. Measures of balance sheet health became more prominent in such models after the Asian financial crisis, especially in predicting banking crises. A combination of government solvency and liquidity indicators have also been used in studies of sovereign debt crises.

### Debt accumulation and financial crises: An econometric analysis

**Econometric specification**. In the baseline regression specification, the probability of a financial crisis is estimated as a function of the pace of debt accumulation and several control variables in a panel logit model with random effects for a sample of 139 EMDEs over 1970-2018 (Annex 4.2). All explanatory variables are lagged because the focus is on pre-conditions that make crises more likely. In addition, the use of lagged variables attenuates potential endogeneity bias caused by contemporaneous interactions between economic fundamentals and crises. Regressions are estimated separately for sovereign debt crises, currency crises and banking crises since these are likely to be associated with different sectoral vulnerabilities.

The correlates of crises are drawn from a rich empirical literature on the determinants of financial crises, or of the vulnerabilities that worsen the impact of crises. This literature has identified the following correlates of higher crisis probabilities:

- *Factors that increase rollover risk.* These are particularly relevant during periods of financial stress; the include high short-term external debt and high or rapidly growing total, government, or private debt; current account deficits;
- *Factors that restrict policy room to respond.* These include low international reserves; large fiscal and current account deficits; and weak institutions.
- *Factors that suggest overvaluation of assets.* These indicate potential for large asset price corrections; the include exchange rate misalignment and credit or asset price booms.

Of these potential correlates, the regression model identifies several that are statistically significant and robust correlates of the probability of financial crises.[2] These include external vulnerabilities (higher short-term debt,

Note: This box was prepared by Wee Chian Koh and Peter Nagle, with contributions from Jongrim Ha, Alain Kabundi, Sergiy Kasyanenko, Wee Chian Koh, Franz Ulrich Ruch, Lei (Sandy) Ye, and Shu Yu.

[1] See Berg, Borensztein, and Patillo (2005); Chamon and Crowe (2012); Frankel and Saravelos (2012); Kaminsky, Lizondo, and Reinhart (1998) for extensive reviews of the literature on early warning models. For models involving currency crises, see Eichengreen, Rose, and Wyplosz (1995); Frankel and Rose (1996); and Kaminsky and Reinhart (2000). For models involving banking crises, see Borio and Lowe (2002); Demirgüç-Kunt and Detragiache (1998); and Rose and Spiegel (2012). For models involving debt crises, see Dawood, Horsewood, and Strobel (2017) and Manasse, Roubini, and Schimmelpfenning (2003).

[2] Annex 4.1 lists the variables used in the baseline model and presents a number of robustness tests; for example, for alternative model specifications (random effects probit model) and twin crises. Twin crises are defined as the simultaneous occurrence of any two types of financial crises (sovereign debt, banking, or currency). Such episodes are usually associated with much larger changes in typical leading indicators. The correlates in the baseline model indeed have higher statistical significance in predicting twin crises than individual crises.

## BOX 4.3 Debt and crises (*continued*)

higher debt service, lower international reserves), adverse shocks (higher U.S. interest rates, lower domestic output growth), and faster debt accumulation—especially if true of both government and private debt.[3] These findings are broadly consistent with the existing literature on leading indicators of financial crises, particularly with regard to the important role of the composition of debt and pace of debt accumulation.[4] In addition, the regressions here suggest that combined private and government debt buildups significantly increase the probability of a currency crisis.

**Debt accumulation.** An increase in debt, either government or private, was associated with significantly higher probabilities of crises in the following year. For example, an increase of 30 percentage points of GDP in *government* debt over the previous year (equivalent to the median buildup during a government debt accumulation episode) increased the probability of entering a debt crisis to 2.0 percent (from 1.4 percent) and that of entering a currency crisis to 6.6 percent (from 4.1 percent). For *private* debt, a 15 percentage points of GDP increase in debt (equivalent to the median increase during a private debt accumulation episode) doubled the probability of entering a banking crisis, to 4.8 percent, or a currency crisis, to 7.5 percent, in the following year—probabilities that are considerably larger than those for a similarly-sized buildup in government debt.

**Combined government and private debt increase.** Simultaneous increases in both government and private debt amplified the probability of a currency crisis. Thus, a 15 percentage points of GDP increase together with a 30 percentage point of GDP increase in government debt resulted in a 24 percent probability of entering a currency crisis the next year—more than six times the probability had debt remained stable (3.9 percent) and about one-third more than similarly-sized government or private debt buildup separately.

**Adverse shocks.** Compared to average growth outside crises (4 percent), growth in EMDE crisis episodes averaged -1 percent. Contractions of this magnitude increased the probability of entering a sovereign debt crisis in the subsequent year to 1.9 percent from 1.2 percent outside crisis episodes. A 2-percentage point increase in U.S. real interest rates—half the cumulative increase during a typical tightening phase of U.S. monetary policy—increased the probability of entering a currency crisis by one-half to 6.0 percent from 4.1 percent.

**External vulnerabilities.** A larger share of short-term debt in external debt, greater debt service cost and lower reserve cover were associated with significantly higher probabilities of financial crises.

- *Short-term debt.* Compared to the probability of a sovereign debt crisis of 1.2 percent associated with a share of short-term debt of 10 percent of external debt (the average during non-crisis episodes), a 30 percent share of short-term debt in external debt (Mexico's share before it plunged into a twin currency and debt crisis in 1982) raised the probability of entering a sovereign debt crisis in the following year to 2.0 percent.

- *Debt service.* A 50 percent ratio of debt service to exports—Mexico's average debt service burden in the early 1980s—was associated with probabilities of entering a sovereign debt crisis of 2.8 percent and a banking crisis of5.5 percent. This was more than double the probabilities associated with a 15 percent debt service-to-export ratio in the average non-crisis episode.

- *Reserve coverage.* The probability of a debt or banking crisis exceeded 3 percent, and that of a currency crisis 5 percent, for a reserve coverage of 1 month of imports (which was the case in Mexico in the early 1980s) compared to probabilities of 0.6-2.0 percent for banking and debt crises, and 3.8 percent for currency crises, when the reserve coverage amounted to 4 months of imports (the average for non-crisis episodes).

**Other vulnerabilities.** Other vulnerabilities identified tended to be more specific to certain types of crises or borrowing sectors.

- *Wholesale funding.* Higher wholesale funding, proxied by the ratio of credit to deposits, was associated with a greater probability of a banking crisis but appears to have been largely unrelated to the probabilities of sovereign debt and currency crises.

[3] The same variables remain statistically significant in a regression that combines sovereign debt and banking crises, but the change in government debt becomes insignificant. This may reflect the fact that banking crises have been more than twice as common as sovereign debt crises since 1970. Since almost all crises in the sample are associated with debt accumulation episodes, dummy variables indicating the presence of a private or government or combined (private and government) debt accumulation episode are not statistically significant.

[4] Relevant empirical regularities are discussed in, for example, Manasse, Roubini, and Schimmelpfenning (2003) on sovereign debt crises; Kauko (2014) on banking crises; and Kaminsky, Lizondo, and Reinhart (1998) on currency crises.

## BOX 4.3 Debt and crises (*continued*)

- *Real exchange rate overvaluation.* Real exchange rate overvaluation was associated with a higher probability of a currency crisis but tended to be largely unrelated to banking and sovereign debt crises (Dornbusch et al. 1995).
- *Concessional debt and FDI flows.* A higher share of concessional debt, which consists of loans extended on more generous terms than commercial ones, was associated with a lower probability of a sovereign debt crisis but tended to be largely unrelated to banking and currency crises. Larger FDI inflows, a more stable form of finance than portfolio inflows, were associated with a lower probability of a currency crisis.

**Crisis probabilities: Small or large?** In isolation, some of these probabilities may appear small. This is expected since they are associated with individual indicators. However, the probabilities could cumulate rapidly when multiple indicators deteriorate at the same time as has frequently happened prior to financial crises. Indeed, as documented in the previous chapters, in a typical financial crisis, an adverse shock is often compounded by elevated debt and multiple other vulnerabilities.

### Lessons from financial crisis episodes

The preceding section quantified how shocks and vulnerabilities have affected the likelihood of crises. In addition, beyond measures that can be easily quantified, countries with financial crises during or after a debt accumulation episode shared some structural and institutional weaknesses that made their economies more prone to crises once an adverse shock hit. These structural and institutional weaknesses are explored in this section in a set of selected country case studies of financial crises.

These case studies look into 43 crisis episodes in 34 EMDEs that have witnessed rapid government or private debt accumulation episodes since 1970 (Annex 4.3). Most of these cases (65 percent) involved overlapping private and government debt accumulation episodes. Almost all cases (90 percent) involved twin crises, and 40 percent involved triplet crises.[5]

[5] The main references for these country case studies are provided in Kose et al.(2019). For a discussion of some of these macroeconomic, structural and institutional shortcomings see Balassa (1982); Kaufmann (1989); and Sachs (1985, 1989) on growth strategies and uses of debt; Roubini and Wachtel (1999) on current account sustainability; Daumont, Le Gall, and Leroux (2004) and Kawai, Newfarmer, and Schmukler (2005) on inadequate banking regulation; Brownbridge and Kirkpatrick (2000) on balance sheet mismatch; and Capulong et. al. (2000) for poor corporate governance.

#### *Macroeconomic policies*

**Inefficient use of debt.** In addition to financing import substitution policies, public debt was used in some countries in the first wave to finance current government spending and policies that led to overly expansionary macroeconomic policies (Argentina, Brazil, Chile, Peru). In other countries, rapid private-sector borrowing resulted in debt-fueled domestic demand booms, including property booms (Thailand, Ukraine) or inefficient manufacturing investment (Korea).

**Inadequate fiscal management.** Many countries had severe fiscal weaknesses. This included weak revenue collection (Argentina, Brazil, Indonesia, Russia), widespread tax evasion (Argentina, Russia), public wage and pension indexing (Argentina, Brazil, Mexico, Uruguay), monetary financing of fiscal deficits (Argentina, Brazil), and substantial use of energy and food subsidies (Egypt, Venezuela).

**Risky composition of debt.** Many of the crisis countries borrowed in foreign currency. They struggled to meet debt service obligations and faced steep jumps in debt ratios following currency depreciations (Indonesia, Mexico, Thailand). In Uruguay, for example, almost all public debt was denominated in U.S. dollars in the mid-1990s. Several countries relied on short-term borrowing and faced rollover difficulties when investor sentiment deteriorated (Indonesia, Korea, Philippines, Russia in the late 1990s). In Europe and Central Asia (ECA) in the 2000s, countries borrowed cross-border from nonresident lenders and faced a credit crunch once liquidity conditions tightened for global banks that were the source of this lending (Hungary, Kazakhstan in the late 2000s).

**Balance sheet mismatches.** A substantial number of currency and banking crises, and the majority of concurrent currency and banking crises, were associated with balance sheet mismatches (Indonesia, Malaysia, Mexico, and Russia in the late 1990s). Sovereign debt crises less frequently involved balance sheet mismatches, except when banking supervision was weak (Indonesia, Turkey in the 1990s).

#### *Structural and institutional features*

**Poorly designed growth strategies.** Many of the case studies of crises in the 1970s and early 1980s showed heavy state intervention through state-led industrialization, state-owned companies, and state-owned banks (Balassa 1982). Industrial policy in countries such as Argentina,

## BOX 4.3 Debt and crises (*continued*)

Brazil, and Venezuela focused on import substitution industrialization, typically financed by external borrowing.

**Lack of economic diversification.** A number of the crisis countries had undiversified economies, which increased their vulnerability to terms of trade shocks. Several countries in Latin America and the Caribbean (LAC) and Sub-Saharan Africa (SSA), in particular, were heavily dependent on both oil and non-oil commodity exports (Bolivia, Niger, Nigeria, Paraguay, Uruguay in the 1970s and 1980s). When commodity prices fell in the 1980s, the profitability of (often state-owned) corporates in the resource sector, fiscal revenues, and export proceeds collapsed, which triggered financial crises.

**Inadequate banking regulation.** Poor banking regulation was a common feature in many case studies. Several SSA countries experienced banking crises in the 1980s primarily because of the failure of banks that were typically state-owned and subject to little oversight (Cameroon, Kenya, Niger, and Tanzania). In EAP, financial deregulation contributed to insufficient regulation and oversight of the financial sector in the second wave (Indonesia, Korea, Malaysia, Philippines, and Thailand). This resulted in growing weaknesses, including balance sheet mismatches, and excessive risk taking by corporates (see below). In several countries in ECA during the 2000s, cross-border lending was inadequately regulated by domestic regulators (Hungary and Kazakhstan).

**Poor corporate governance.** Among case studies of the 1980s and 1990s, poor corporate governance was a common shortcoming, notably in some East Asian countries (Indonesia, Korea, and Thailand). Along with poor bank regulation, this led to inefficient corporate investment, as banks lent to firms without rigorously evaluating their creditworthiness.

**Political uncertainty.** Many sovereign debt crises were associated with severe political uncertainty (Indonesia, Philippines, Turkey, Venezuela).

### *Triggers and resolution of crises*

**Triggers**. The case studies suggest that crises were usually triggered by external shocks, although in a small number of countries domestic factors also played a role.

- *External macroeconomic shocks.* The most common trigger of crises was an external shock to the real economy. These included a sudden rise in global interest rates (LAC in the 1980s), a slowdown in global growth (ECA in the 2000s), a fall in commodity prices for commodity exporting economies (LAC and SSA in the 1980s, Russia in the 1990s), and contagion from both global crises (2007-09 global financial crisis) and regional crises (East Asian financial and Russian crises in the 1990s), which generated sudden withdrawals of capital inflows.
- *Natural disasters and domestic shocks.* Natural disasters such as droughts were a major contributing factor to crises in some countries, typically smaller, less diversified economies (e.g. Bangladesh in the 1970s, Nepal in the 1980s, Zimbabwe in the 2000s).
- *Other domestic shocks.* In a small number of countries, crises were triggered, or exacerbated, by other domestic shocks. Typically, these were episodes of political turmoil (Turkey, Zimbabwe).

**Crisis resolution.** Many, though not all, crises were resolved by policy programs of adjustment and structural reform supported by financing from the IMF, World Bank, and other multilateral bodies and partner countries.

- *IMF support.* The vast majority of countries in these case studies adopted IMF-supported policy programs to overcome their crises. The countries that did not use IMF support typically had stronger fundamentals, including lower public debt and larger international reserves (e.g. Colombia, Kazakhstan, Malaysia).
- *Debt restructuring.* Among the case studies of sovereign debt crises, many ended with default and restructuring of debt (e.g. Argentina, Mexico, Nigeria). These cases were more common in the 1980s, 1990s, and early 2000s. Debt restructuring was often prolonged and occurred well after the initial sovereign debt crisis.
- *Reforms.* IMF support was conditional on the implementation of macroeconomic and structural reforms. For many EMDEs in LAC in the 1980s and in EAP in the late 1990s, crises were the trigger for policy changes to allow greater exchange rate flexibility and strengthen monetary policy regimes.

### Conclusion

Crises are typically sparked by an adverse shock, such as an increase in global interest rates or a growth slowdown, whose impact is amplified and propagated via country vulnerabilities such as high levels of debt, especially short-term debt, and low international reserves. In line with the literature, the econometric exercise conducted here

**BOX 4.3 Debt and crises (*continued*)**

documents that a rapid rise in government or private debt increases the probability of crises. A combined runup in government and private debt—as has been the case during the fourth global wave—increases the probability of a currency crisis.

In several cases, crises revealed shortcomings that were mainly recognized *ex post* but had rarely been flagged before these crises. Following these crises, research (described in academic studies and policy reports) shifted its focus to these issues. For example, the Asian financial crisis propelled the challenges of balance sheet mismatches and weak corporate governance as well as the need for robust bank supervision to the forefront of policy discussions (Brownbridge and Kirkpatrick 2000; IMF 1999). The launch of the Financial System Assessment Program in 1999 started systematic assessments of financial sectors (IMF 2000). The 2007-09 global financial crisis shifted an earlier consensus on the use of capital controls. Before 2008, capital controls were largely considered ineffective and detrimental (Forbes 2004, 2007). After the global financial crisis, the literature shifted to a guarded endorsement of capital controls is appropriately designed and implemented in the "right" circumstances (Forbes, Fratzscher, and Straub 2015; IMF 2012, 2015b).

## Rapid debt accumulation episodes

Spurts in debt buildups are common in EMDEs. When they coincide in many EMDEs, they form the global waves of debt discussed above. This section examines the implications of national rapid debt accumulation episodes at the country level. It uses an event study approach that compares rapid debt accumulation episodes that coincided with a financial crisis (which might be a currency, banking, or sovereign debt crisis) with those that escaped a crisis. Box 4.3 analyses the factors which increase the likelihood of a financial crisis occurring, including quantifying the impact of a rise in debt.

### Features of national rapid debt accumulation episodes

**Definition of episodes.** An episode of rapid debt accumulation is defined as a period during which the government debt-to-GDP ratio or the private sector debt-to-GDP ratio rises by more than one standard deviation from a trough to its next peak. This approach closely follows the dating of turning points of business cycles but the key results are robust to using a definition more closely aligned with the literature on credit booms (Claessens, Kose, and Terrones 2012; Mendoza and Terrones 2012; Annex 4.1). This approach results in 256 episodes of rapid *government* debt accumulation in 99 EMDEs since 1970, among a sample of 100 EMDEs with available data for 1970-2018. It also yields 263 episodes of rapid *private* debt accumulation in 100 EMDEs, out of a sample of 100 EMDEs with available data for 1970-2018.

**Frequency of episodes.** Debt accumulation episodes have been common (Figure 4.7). EMDEs in SAR, SSA, and LAC—the regions with the largest number of episodes per country—had, on average, about 3 government and 3 private debt accumulation episodes since 1970. Most episodes occurred in SSA (34 percent of all government and 33 percent of all private debt accumulation episodes), in part reflecting the large number of countries in the region.

**Duration.** The average duration—the time between trough and peak debt-to-GDP ratios—for both private and public episodes varied widely but amounted to 7 years for the median government episodes and 8 years for the median private episode. Most episodes had run their course in less than a decade. However, 21 percent of government episodes and 29 percent of private debt episodes lasted for more than a decade. The long duration of some of these episodes suggests that the debt buildup in part reflected financial development.

**Amplitude.** Although again with wide

heterogeneity among the episodes, the government debt buildup in the median government debt accumulation episode (30 percentage points of GDP from trough to peak) was double the private debt buildup in the median private debt accumulation episode (15 percentage points of GDP). Variation in the amplitude of debt accumulation episodes across countries was particularly wide for government debt accumulation episodes. In one-quarter of such episodes, the government debt buildup amounted to more than 50 percentage points of GDP. Debt accumulation on such a scale was rare for the private sector: in three-quarters of private debt accumulation episodes, private debt rose by less than 30 percentage points of GDP.

**Combined government and private debt accumulation episodes.** About 70 percent of government and private debt accumulation episodes overlap. These overlapping, combined government and private episodes, are statistically significantly shorter and more pronounced than solely-private or solely-government debt accumulation episodes (Annex Table 4.1.1).

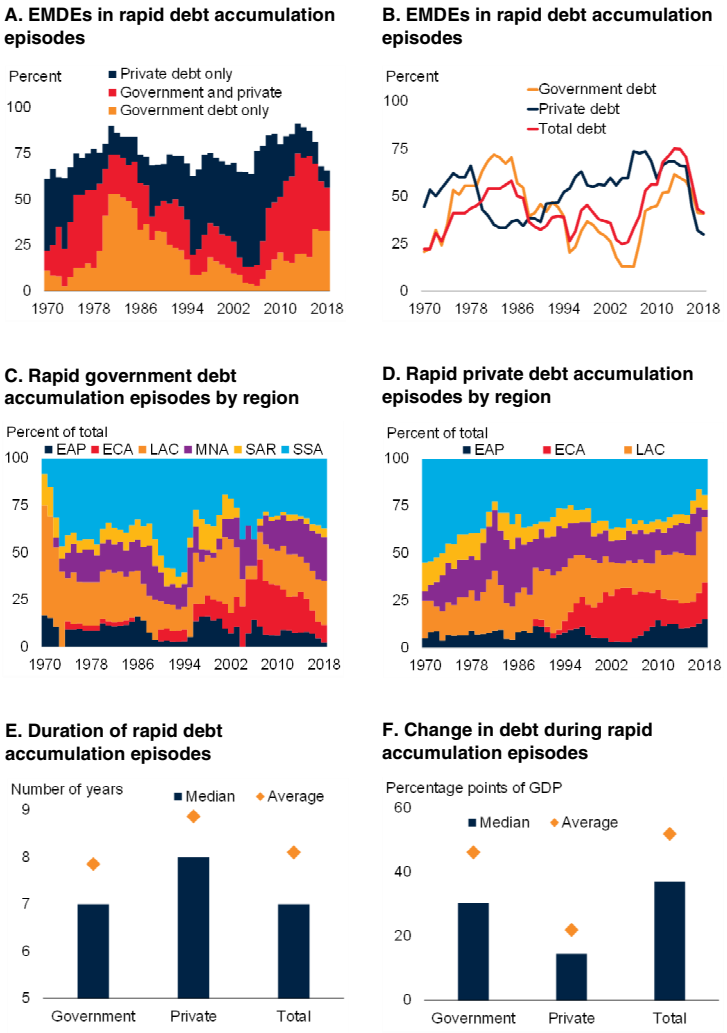
**Episodes coinciding with crises.** Financial crises—defined as in Laeven and Valencia (2018)—can occur at any point during a debt accumulation episode, and more than one type of crisis can occur during an episode. Since 1970, based on all episodes that have concluded, more than half of government debt accumulation episodes and 40 percent of private debt accumulation episodes have been associated with crises (Figure 4.8). Crises were particularly common during the first and second waves. Most crises occurred well before the end of the debt accumulation episode (Annex 4.1). Crises were equally common in longer-lasting (such as those lasting a decade or more) and shorter episodes (lasting less than a decade).

## Macroeconomic outcomes during national rapid debt accumulation episodes

The one-half of debt accumulation episodes that were associated with financial crises had considerably weaker macroeconomic outcomes than those that subsided without crises. The

### FIGURE 4.7 Episodes of rapid debt accumulation in EMDEs

*Episodes of rapid debt accumulation have been common among EMDEs, in both the government and private sectors. In the average year between 1970 and 2018, three-quarters of EMDEs were in either a government or a private debt accumulation episode or both. Since the early 2000s, the number of combined government and private debt accumulation episodes has increased. During 1970-2018, the median debt accumulation episode lasted 7-8 years. During rapid debt accumulation episodes, government debt typically rose (trough to peak) by 30 percentage points of GDP, and private debt by 15 percentage points of GDP.*




Source: International Monetary Fund; World Bank.
A.-D. Share of EMDEs in the sample that are in rapid debt accumulation episodes.
Click here to download data and charts.

**FIGURE 4.8 Crises during rapid debt accumulation episodes in EMDEs**

*About half of all episodes of government and private debt accumulation during 1970-2018 were associated with financial crises. Different types of crises often occurred at the same time. The number of crises has fallen since the first two waves of debt.*


Source: International Monetary Fund; World Bank.
Note: Episodes associated with crises are those which experienced financial crises (banking, currency, and debt crises, as in Laeven and Valencia 2018) during or within two years after the end of episodes. For definition of episodes and sample, see Annex 4.1.
Click here to download data and charts.

macroeconomic implications have tended to be worse when rapid debt growth stemmed from both the government and the private sector.[7]

**Government debt accumulation episodes.** Government debt accumulation episodes that involved crises were typically associated with greater debt buildups, weaker economic outcomes, and higher vulnerabilities than non-crisis episodes (Figure 4.9). In the episodes associated with financial crises, the government debt buildup was about 14 percentage points of GDP larger after eight years than in non-crisis episodes. After eight years, output and output per capita in episodes with crises were around 10 percent lower than in episodes without a crisis; investment was 22 percent lower; and consumption was 6 percent lower. Several external indicators—international reserves, external debt—deteriorated significantly more in episodes associated with crisis than in non-crisis episodes as governments drew down reserves in an effort to stem depreciation.

**Private debt accumulation episodes.** After eight years, private debt accumulation episodes associated with crises featured weaker output and per capita income (by about 6 percent); consumption (by 8 percent); and investment (by 15 percent). Private debt accumulation episodes with crises also saw significantly more pronounced deteriorations in external positions—international reserves, external debt—than non-crisis episodes.

**Similarities.** Regardless of the borrowing sector, rapid debt accumulation episodes with crises featured considerably worse macroeconomic outcomes and vulnerabilities than those not associated with crises. Both types of debt accumulation episodes associated with crises saw larger falls in reserves and greater increases in external debt than non-crisis episodes. Fiscal and current account deficits widened in both types of episodes but more in government debt accumulation episodes than in private debt accumulation episodes.

**Differences.** *Government* debt accumulation episodes associated with crises tended to be more costly than *private* debt accumulation episodes associated with crises, with much larger shortfalls in output growth, especially in the early years after a crisis. Conversely, government debt accumulation episodes associated with crises featured much larger drops in investment than similar private debt accumulation episodes, possibly reflecting greater disruptions to financing conditions in crises during government debt accumulation episodes.

## What comes next?

The current wave, not yet a decade old, has already included the euro area debt crisis and several EMDE currency crises. Although EMDEs have

[7] Combined government and private debt accumulation episodes were accompanied by significantly weaker investment and consumption growth than solely-private episodes. Excluding episodes associated with crises, combined episodes also featured slower overall growth than solely private debt accumulation episodes.

gone through periods of volatility during the current wave of debt, they have not yet experienced widespread financial crises. The key question is whether the current wave of debt accumulation will at some point end in financial crises in many EMDEs, as all its predecessors eventually did, or whether such crises will be avoided perhaps because EMDEs have learned and applied their lessons from the past.

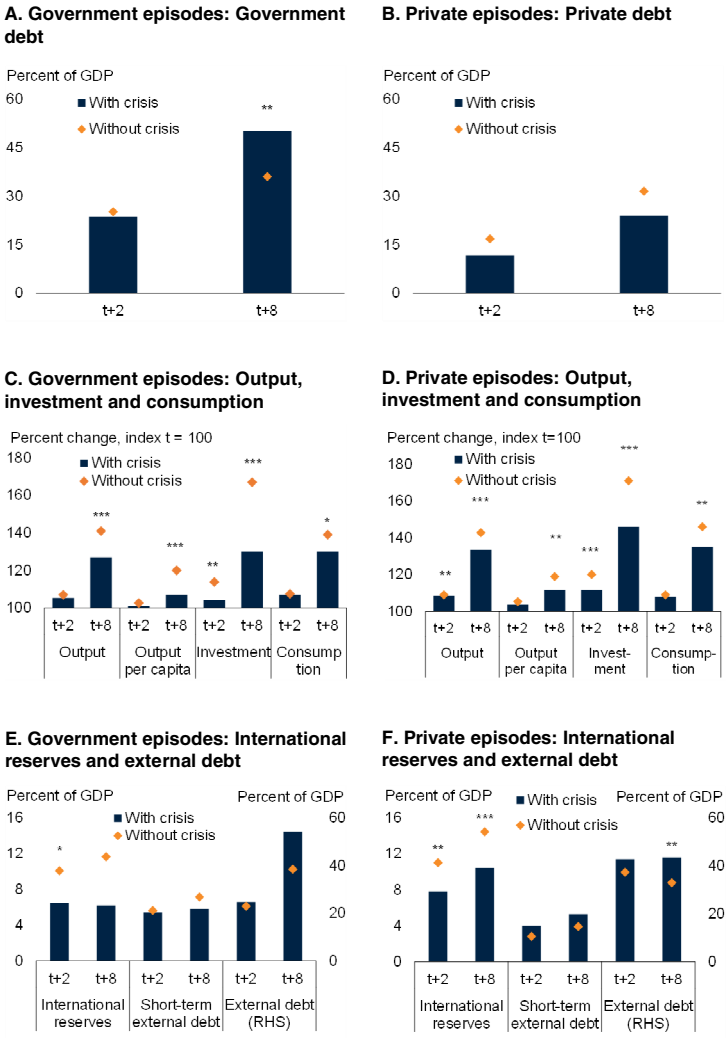
**Prolonged period of low interest rates.** The current environment of low interest rates and persistently low inflation in advanced economies alleviates some risks associated with the latest wave of debt. Policy interest rates in many advanced economies are near historical lows after major central banks recently reverted to an easing stance after winding down tightening cycles in 2018 (Figure 4.10). Monetary policy in advanced economies is likely to be accommodative for the foreseeable future as growth prospects and inflation expectations remain subdued. Interest payments on government debt in EMDEs have fallen from an average of 2.6 percent of GDP in 2000-07, to 1.6 percent of GDP in 2010-18, despite the increase in debt over that period. At current nominal GDP growth and long-term interest rates, debt appears to be on stable or falling trajectories in almost half of EMDEs.

An easing of U.S. financial conditions, a bellwether for global financial conditions, has typically accompanied an increase in capital flows to EMDEs (Feyen et al. 2015). But increased borrowing can also raise vulnerability to a future rebound in interest rates. Historically, rising global interest rates have been a key trigger for financial crises (Bulow et al. 1992; Bulow and Rogoff 1989; Reinhart and Rogoff 2010, 2011). Hence, low or falling global interest rates provide no sure protection against financial crises for EMDEs. Half of all crises during episodes of rapid debt accumulation occurred in years when U.S. long-term (10-year) interest rates were falling and one-eighth of episodes occurred in years when U.S. long-term real interest rates were below 1 percent (as they have been since 2016).

**Weak growth prospects.** In addition to interest rates and fiscal positions, growth is another major determinant of debt sustainability. An important

## FIGURE 4.9 Macroeconomic developments during debt accumulation episodes

*Rapid debt accumulation episodes associated with financial crises show slower output, investment and consumption growth. Private debt accumulation episodes associated with crises also had lower international reserves and higher external debt than episodes without any crisis events.*

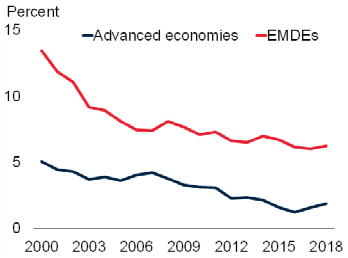



Source: Bruegel; International Monetary Fund; Laeven and Valencia (2018); World Bank.
Note: Median for episodes with data available for at least 8 years from the beginning of the episode. Year "t" refers to the beginning of rapid government debt accumulation episodes. Episodes associated with crises are those that experienced financial crises (banking, currency, and debt crises, as in Laeven and Valencia (2018)) during or within two years after the end of episodes. "*", "**", and "***" denote that medians between episodes associated with crises and those with no crises are statistically different at 10 percent, 5 percent, and 1 percent levels, respectively, based on Wilcoxon rank-sum tests.
A.B. Government (A) or private (B) debt in percent of GDP two and eight years after the beginning of the government debt accumulation episode (t).
C.D. Cumulative percent increase from t, based on real growth rates for output (GDP), output (GDP) per capita, investment, and consumption.
E.F. Series shown as percent of GDP.
Click here to download data and charts.

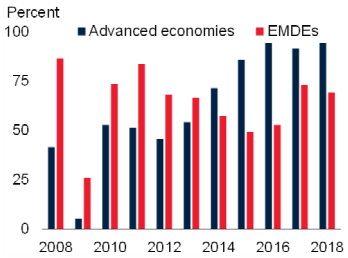
## FIGURE 4.10 Fourth wave: Opportunities and risks

*The current environment of very low interest rates has alleviated immediate risks associated with the latest accumulation of debt since long-term interest rates are below growth in about half of EMDEs. However, while debt levels in advanced economies are on a sustainable path, debt levels in almost half of EMDEs are on a rising path. Although current levels of EMDE government or private debt are, on average, still below or near those in the median rapid debt accumulation episode, increases in government or private debt since 2010 have already exceeded those of the typical historical episode in about one-quarter of EMDEs.*

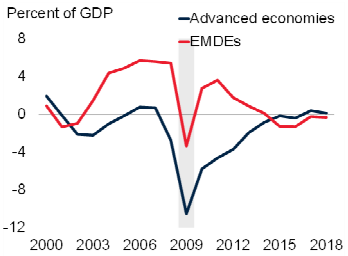
**A. Long-term interest rates**



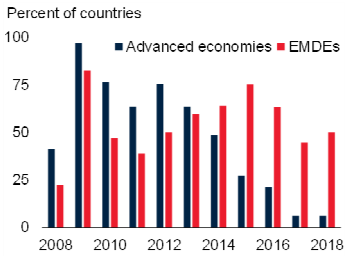

**B. Share of economies with interest rates below growth**



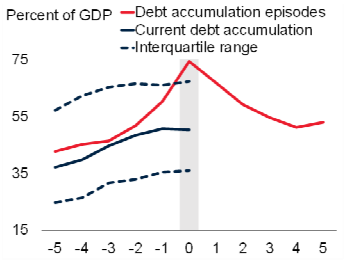

**C. Sustainability gaps**



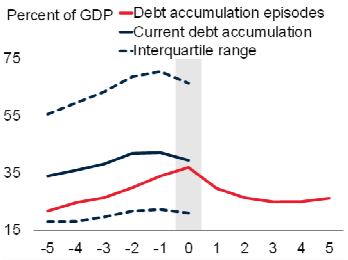

**D. Countries with negative sustainability gaps**




**E. Current levels of government debt vs. previous rapid debt accumulation episodes**




**F. Current levels of private debt vs. previous rapid debt accumulation episodes**




Source: Bloomberg; Kose et al. (2017); World Bank.

A. Average long-term nominal government bond yields (with maturity of 10 years) computed with current U.S. dollar GDP as a weight, based on up to 36 advanced economies and 84 EMDEs.

B. Share of countries where long-term nominal interest rates (represented by 10-year local currency government bond yields) are below nominal GDP growth for 1990-2018 in up to 34 advanced economies and 83 EMDEs.

C.D. A sustainability gap is defined as the difference between the actual primary balance and the debt-stabilizing balance. Averages computed with current U.S. dollar GDP as weights, based on at most 34 advanced economies and 83 EMDEs.

D. Share of economies in which sustainability gaps are negative (for example, debt is on a rising trajectory, or fiscal positions are debt-increasing). Sample includes 34 advanced economies and 83 EMDEs.

E.F. Median levels of debt during debt accumulation episodes, as defined in Annex 4.1. t=0 indicates the peak of debt accumulation episodes that were completed before 2018. For current debt accumulation, t=0 indicates 2018.

Click here to download data and charts.

reason for rapid debt accumulation has been the sharp growth slowdown over the course of the fourth wave. EMDE growth slowed after 2020 to a trough of 4.1 percent in 2016 before a modest recovery took hold (Kose and Ohnsorge 2019). Current trends in fundamental drivers of growth suggest that it is likely to slow further over the next decade, to a pace about 0.5 percentage point lower than in 2013-17 (Ruch 2019; World Bank 2018a). For commodity-exporting EMDEs—almost two-thirds of EMDEs—prospects will be further dimmed by the expected slowdown in commodity demand growth as major commodity-consuming EMDEs slow and mature (World Bank 2018b). The past decade has been marked by repeated growth disappointments. If these persist into the next decade, they could lead to growing concerns about debt sustainability, even in a world of low interest rates.

**Vulnerability to external shocks.** The previous three waves highlight the risks associated with a sharp buildup of debt. Financial crises typically occurred when external shocks hit EMDEs with domestic vulnerabilities. Many EMDEs have improved their monetary and fiscal policy frameworks over the past two decades. However, elevated debt levels in the current wave of debt accumulation have been accompanied by rising fiscal, corporate and external vulnerabilities. These include lower international reserves and larger shares of EMDEs with current account and fiscal deficits.

There has been a significant change in the composition of debt in EMDEs. This shift could generate new vulnerabilities. Increasing issuance of foreign-currency-denominated corporate debt in EMDEs has contributed to rising currency exposures and heightened the risks of financial distress in the corporate sector and the banking system in the event of U.S. dollar appreciation.[8] In some EMDEs, the share of nonresident-held bonds in local currency bond markets has grown to more than 30 percent. In LICs, debt has been increasingly financed by non-concessional sources.

[8] This appreciation could be triggered, for example, by reversals of capital flows to EMDEs on heightened global risk aversion.

Shocks could have several sources:

- Although it seems unlikely in the foreseeable future, a return to monetary policy normalization in advanced economies could raise borrowing cost. It would be likely to trigger U.S. dollar appreciation and a turn in investor sentiment that would, especially, affected those EMDEs with large foreign participation in local bond markets (Cerutti, Claessens, and Ratnovski 2017; Ruch 2019).

- A decade of tightening banking regulation has been accompanied by the emergence of credit risk and maturity mismatches in the non-bank financial system in advanced economies (Kose and Ohnsorge 2019). Financial stress in non-bank financial institutions could quickly propagate to the rest of the financial system, owing to the interconnectedness between nonbanks and banks. Growing linkages between non-bank financial systems in advanced economies and EMDEs have increased both the likelihood and the potential magnitude of spillovers from distress in advanced-economy nonbanks to EMDE bond markets and broader financial systems.

- Many commodity-exporting EMDEs rely heavily on revenues from the resource sector to find government expenditures and service sovereign debt (Correa and Sapriza 2014). As a result, commodity price shocks have periodically disrupted government finances and been a source of financial instability in EMDEs, culminating in some cases in sovereign debt default or other financial crises.

- The large corporate debt buildup in China has been primarily to domestic creditors. Its counterpart in the financial system could eventually reveal non-performing loans and result in a growth slowdown in China. Concerns remain that the rapid pace of investment growth may have contributed to overcapacity in some industries (Yu and Shen 2019; Wang, Wan and Song 2018; Maliszewski et al. 2016). Although it has recently declined, high corporate leverage in China, particularly that of state-owned enterprises, has been associated with a deterioration of corporate financial performance, and many corporates are facing deteriorating profitability (Molnar and Lu 2019; World Bank 2018b, 2019a). In view of the size of China's economy, adverse spillovers to other EMDEs would be likely (Ahmed et al. 2019; World Bank 2016b).

- LICs have accumulated debt rapidly and increasingly from non-concessional and less transparent sources (Essl et al. 2019). This increases their vulnerability to financing shocks and to the revelation of previously undisclosed debt obligations (Bova et al. 2016; Horn, Reinhart, and Trebesch 2019; Lee and Bachmair 2019).

- For some EMDEs, risks related to climate change are substantial. The experience of several economies in LAC shows that debt crises can be triggered by natural disasters (Rasmussen 2004). To the extent that natural disasters are becoming more frequent and persistent as a result of climate change, they pose a growing risk to debt sustainability in vulnerable EMDEs. Furthermore, the move to a low-carbon economy could have a material effect for energy-exporting EMDEs. A shift away from the use of carbon-intensive fuels could leave the assets of fossil fuel companies, including state-owned companies, stranded by rules to curb climate change (Carney 2015). This could have critical implications for debt sustainability both at the firm and the country level.

**Vulnerability to domestic shocks.** Elevated debt increases an economy's vulnerability to domestic financing and political shocks even in an environment of benign global financing conditions. Domestic financing shocks can trigger sharp increases in borrowing cost. These may include the sudden emergence of contingent government liabilities, including in state-owned enterprises or public-private partnerships. Policy surprises or sudden bouts of policy uncertainty can also fuel investor concerns about debt repayment, causing a jump in borrowing cost.

**Broader costs of debt accumulation.** In addition to restricting economies' ability to weather shocks,

high debt may also act as a constraint on growth of its own accord through three effects (Kose et al. 2019). First, high debt constrains governments' ability to respond to downturns. For example, fiscal stimulus during the 2008-09 global financial crisis was considerably smaller in countries with high government debt than in those with low government debt (World Bank 2015).

As well as limiting the use of fiscal policy, high government debt tends to render fiscal policy less effective (Huidrom et al. 2019). Second, high debt service costs may crowd out growth-enhancing public investment or social safety nets (Obstfeld 2013; Reinhart and Rogoff 2010; Romer and Romer 2018). Third, high debt could also create uncertainty about macroeconomic and policy prospects (IMF 2018a; Kumar and Woo 2010). This can crowd out productivity-enhancing private investment and weigh on output growth.

## Seven lessons

The analysis of waves of global and national debt accumulation episodes yields several important lessons for EMDEs. Box 4.3 complements the lessons learned by considering 43 episodes of debt accumulation followed by financial crises in 34 EMDEs, and examining the similarities and differences between these case studies.

**Accumulate debt with care.** Borrowing, when well spent and sustainable, could support growth. Waves of broad-based debt accumulation have typically coincided with global upturns amid accommodative monetary policy and financial market development. However, about half of rapid debt accumulation episodes at the country level were associated with financial crises. Episodes of rapid government debt accumulation were more likely than episodes of rapid private debt accumulation to be associated with crisis, and were costlier than rapid buildups of private debt.

**Use debt efficiently.** The present combination of weak global growth and low interest rates makes government debt accumulation an appealing option for EMDEs to boost growth-friendly spending (World Bank 2019d). However, it is critical that the debt be used for productive purposes to boost potential growth and exports, as painfully learned from the experience of the first wave. Crises were common in countries that borrowed heavily to finance state-led industrialization or real estate markets (e.g. Argentina and Brazil in the first wave, Thailand in the second wave).

**Maintain a resilient debt composition.** A debt composition tilted toward foreign currency-denominated, short-term, or nonresident-held debt makes countries more vulnerable to shifts in market sentiment, currency depreciation, or spikes in global interest rates and risk premia. Crises have been more likely when the share of short-term debt was higher. The first and second waves showed how a high share of foreign currency-denominated debt meant that currency depreciations led to an increase in both debt servicing costs and debt ratios.

**Regulation and supervision matter.** Inadequate regulatory and supervisory regimes, including gaps in coordination between home and host supervisors, can encourage excessively risky lending and debt buildup. This was the case in the Asian financial crisis during the second wave and in ECA countries during the third wave. Conversely, a robust regulatory system, that is also well coordinated between home and host supervisors of foreign banks, can temper the incentive to take excessive risks resulting from the public safety net for the financial system (moral hazard; Briault et al. 2018).

**Beware of external shocks (especially when there are domestic vulnerabilities).** Crises typically occurred when external shocks hit countries that had substantial domestic vulnerabilities, including a reliance on external and short-term debt in conjunction with a fixed exchange rate and low levels of international reserves (Bordo, Meissner, and Stuckler 2010; Mishkin 1999). In contrast, countries with higher international reserves were significantly more resilient to these types of shocks (Gourinchas and Obstfeld 2012). In addition to external shocks, domestic political shocks contributed to crises by increasing policy uncertainty and weakening investor sentiment.

**Private debt can rapidly turn into government debt.** Large private sector losses, including losses threatening bank solvency, and the materialization of contingent liabilities, including those of state-owned enterprises, can lead governments to provide substantial financial support (Mbaye, Moreno-Badia, and Chae 2018b). This occurred in the EAP region in the second wave, and in ECA in the third wave, with governments providing substantial support to banks. While the provision of government support can save the banking system from collapse, it can also lead to a steep jump in public debt which, in turn, can heighten the fragility of banks with large sovereign exposures (Bova et al. 2016; Claessens et al. 2014; Feyen and Zuccardi 2019; World Bank 2015). Fiscal space can shrink rapidly as a result even though fiscal deficits may have been moderate.

**Develop effective mechanisms to recognize losses and restructure debt.** Having mechanisms in place to promptly recognize and restructure debt can improve the prospects for recovery from crisis, particularly public debt crises (Kroszner 2003) or banking crises (Rutledge et al. 2012). The protracted resolution after the Latin American crises of the 1970s and the SSA debt distress in the 1980s and 1990s were associated with a period of very low, or even negative, per capita income growth. Growth only rebounded after the Brady plan and the HIPC and MDRI debt initiatives resolved debt distress and reduced debt overhangs.

## Policy implications

Policy frameworks have improved in many EMDEs since the first two waves of debt. These improvements played a critical role in mitigating the adverse impact of the global financial crisis on these economies at the end of the third wave of debt accumulation. However, there is still considerable scope for further improvement. Specific policy priorities ultimately depend on country circumstances but there are four broad strands of policies that can help contain the risks associated with the recent debt accumulation.

### *Policies for managing debt*

Governments need to put in place mechanisms and institutions that help them strike the proper balance between the benefits and costs of additional debt. These include sound debt management, high debt transparency, and thorough monitoring of contingent liabilities. While these policies mostly apply to borrowers, creditors also need to implement measures to mitigate risks associated with excessive debt accumulation.

**Sound debt management** can help reduce borrowing costs, enhance debt sustainability, and dampen fiscal risks.[9] Debt managers are increasingly adopting pro-active policies to build buffers and make the composition of debt more resilient, but further progress is needed (World Bank 2013). Prudent debt management favors debt contracted on terms that preserve macroeconomic and financial resilience—preferably at longer maturities, at fixed (and favorable) interest rates, and in local currency. A debt composition that is less vulnerable to market disruptions reduces the likelihood that a decline in market sentiment, sharp depreciations, or interest rate spikes erode debt sustainability. A well-developed and liquid domestic bond market can reduce the need for foreign currency-denominated lending and help ensure stability in government financing (Arvai and Heenan 2008; World Bank and IMF 2001).

**Transparency about balance sheets** is a pre-requisite for sound debt management. History shows that public debt spikes can reflect the revelation of previously undisclosed liabilities such as those revealed in Mozambique during the fourth wave (Jaramillo, Mulas-Granados, and Jalles 2017; Weber 2012). Greater fiscal transparency is associated with lower borrowing costs, improvements in government effectiveness and lower government debt (Kemoe and Zhan 2018; Montes, Bastos, and de Oliveira 2019). Improvements in data collection practices for LIC debt would help policymakers undertake better-informed borrowing decisions, and have been associated with lower borrowing costs (Cady and Pellechio 2006; World Bank and IMF 2018c).

[9] Recognizing the need for better debt management, the World Bank and IMF have developed guidelines, best practices, and frameworks to assist countries in implementing debt management strategies (World Bank and IMF 2014).

Principles and guidelines for debt transparency have been created, both by international financial institutions, including the IMF's fiscal transparency code, and by the private sector (IIF 2019a; IMF 2019d).

**Monitoring and mitigation of contingent liabilities** are integral for sound public debt management. Recent survey evidence suggests that a majority of public debt managers are *monitoring* risks of contingent liabilities; only a minority, however, use risk *mitigation* tools, such as reserve accounts (40 percent of respondents) or risk exposure limits on contingent liabilities (30 percent of respondents; Lee and Bachmair 2019).

**Creditors, including international financial institutions,** play an important role in mitigating the risks associated with debt accumulation. For example, while country authorities have the primary responsibility to transparently report their debt data, international financial institutions support transparency and sustainable lending practices through several measures. The IMF and the World Bank collect and disseminate debt statistics that are used by a wide range of stakeholders; produce published analyses of public debt data via debt sustainability analyses (DSAs); support countries' efforts to produce medium-term debt management strategies (MTDSs); publish information on countries' borrowing capacity; and directly liaise with multilateral, bilateral, and private creditors. All of these efforts provide important support to borrowers and lenders in their decision making.

### *Macroeconomic policies*

Notwithstanding substantial improvements since the 1990s, macroeconomic policy frameworks can be strengthened further in many EMDEs (Kose and Ohnsorge 2019). Monetary policy frameworks and exchange rate regimes can be strengthened to increase central bank credibility. Fiscal frameworks can ensure that borrowing remains within sustainable limits and borrowed funds are used well.

**Macroeconomic and exchange rate policy frameworks**. The benefits of stability-oriented and resilient monetary policy frameworks cannot be overstated. During episodes of financial stress, when EMDE currencies tend to depreciate sharply, strong monetary policy frameworks will be helpful not least because the exchange rate pass-through to inflation tends to be smaller in countries with more credible, transparent and independent central banks; inflation-targeting monetary policy regimes; and better-anchored inflation expectations (Kose et al. 2019). With less pass-through from depreciation to inflation, central banks in EMDEs will have more scope to support activity. Flexible exchange rates can provide an effective mechanism for macroeconomic adjustment and can help avoid currency overvaluations and the buildup of large currency mismatches on balance sheets—a common precursor of crises. A flexible exchange rate regime requires, however, that monetary policy pursue a credible policy of inflation control to provide an effective nominal anchor to the economy. Such a policy framework needs to be complemented by strong macroeconomic and institutional arrangements.

**Fiscal rules** can help avoid fiscal slippages, ensure that revenue windfalls during times of strong growth are prudently managed, and manage and contain risks from contingent liabilities (Cebotari 2008; Currie and Velandia 2002; Romer and Romer 2019; Ulgenturk 2017). Strong fiscal frameworks have also been associated with lower inflation and inflation volatility, supporting the central bank in delivering its mandate (Ha, Kose, and Ohnsorge 2019). EMDEs have made important strides in the adoption and design of fiscal rules (Schaechter et al. 2012).[10] However, fiscal rules may only be effective once a certain degree of broader government effectiveness is achieved and sound budgetary institutions are in place.[11]

[10] Schaechter et al. (2012) create an overall fiscal rule index that captures both the number and characteristics of fiscal rules in operation in advanced economies and EMDEs and show how EMDEs have played catch-up to advanced economies since 2000. Ardanaz et al. (2019) find that well-designed fiscal rules can help safeguard public investment during downturns.

[11] Calderón and Nguyen (2016) estimate that fiscal and monetary policy procyclicality is greater in countries with weak institutions. Bergman and Hutchison (2015, 2018) show that fiscal rules are effective only when government effectiveness exceeds a minimum threshold. World Bank (2015) discusses the circumstances and features that can make fiscal rules more effective.

**Alternatives to debt accumulation** are available to expand fiscal resources for priority spending. Public spending can be reallocated to uses that are more likely to boost future growth, including education and health spending as well as climate-smart infrastructure investment to strengthen economic resilience. Government revenue bases can be broadened by removing special exemptions and strengthening tax administration (Gaspar, Ralyea, and Ture 2019; IMF 2019c; World Bank 2017b). Government can also take action to foster private sector-led growth. Reform agendas to improve business climates and institutions have resulted in significant gains in investment and productivity EMDEs (World Bank 2018a). In turn, increased private sector growth expands the revenue base and, ultimately, strengthens government revenues.

### *Financial sector policies*

Robust financial sector regulation and supervision can help prevent risks from building up. Financial market deepening can help mobilize domestic savings that may provide more stable sources of financing than capital inflows.

**Improved financial system regulation and supervision, b**y acting on systemic exposures and ensuring adequate capital buffers, can help prevent risks from building up. Robust prudential regulation and supervision can help pre-empt the buildup of systemic financial weaknesses. Macroprudential policies can help moderate lending to households and corporates. The use of living wills for banks and robust bank bankruptcy regimes can also help with the orderly winding down of insolvent institutions, including through the bail-in of creditors. Credibility and predictability of bank resolution can help prevent spillovers from the failure of one financial institution to others by reassuring creditors about the continued functioning of the financial system as a whole (Hoshi 2011).

**Financial market deepening** can help expand the pool of stable long-term domestic savings available for domestic investment. This requires an enabling environment of robust institutions, protection of creditor rights, sound regulatory quality and macroeconomic stability (Laeven 2014; Sahay et al. 2008). At the same time, however, excessively rapid growth in financial markets can generate financial stability risks. A careful balance between measures to promote financial market deepening and supervision and regulation is critical.

### *Strengthening institutions*

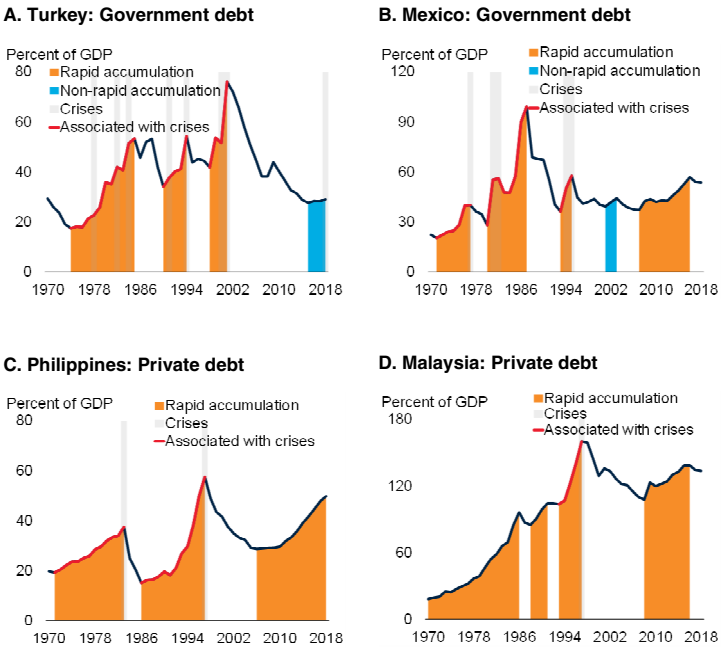
Well-enforced frameworks for sound corporate governance can help ensure that funds borrowed by private corporates are well used. Sound bankruptcy frameworks can help prevent debt overhangs from weighing on investment for prolonged periods.

**The promotion of good corporate governance** can mitigate risks arising from the corporate sector. Stronger corporate governance can tilt firms' financing towards equity rather than debt (Mande, Park, and Son 2011); increase hedging of foreign currency positions to protect against external shocks (Lel 2012); and encourage more efficient firm operation (Henry 2010). Other measures can also help contain risks from corporate credit growth, such as increased stress testing of listed corporates' balance sheets.

**Effective bankruptcy and insolvency regimes** can help in the resolution of private debt crises and have benefits outside of crises (Leroy and Grandolini 2016). Several EMDEs have recently reformed bankruptcy procedures, but in general, EMDE bankruptcy protection laws lag international best practices.[12] Strengthening bankruptcy protection can boost investment and facilitate responsible corporate risk-taking, helping to relieve the costs of debt overhang (World Bank 2014b). Well-functioning legal, regulatory, and institutional frameworks are crucial for commercial banks and companies to resolve non-performing loans and facilitate business exit and reorganization (Menezes 2014). A robust insolvency regime can improve financial inclusion and increase access to credit, by reducing the cost of lending.

[12] These include the introduction of a new bankruptcy law in Egypt and strengthening of secured creditors' rights in India.

**ANNEX FIGURE 4.1.1 Country examples of debt accumulation episodes**




Source: International Monetary Fund; World Bank.
Note: Blue line indicates debt outside debt accumulation episodes. A period of debt accumulation is identified with the algorithm in Harding and Pagan (2002). When a change in debt-to-GDP ratios over an accumulation period is above the maximum of 10-year moving standard deviation of the ratios during the period, it is considered as a rapid debt accumulation (shown as an orange area). When it is below the threshold, it is treated as a non-rapid accumulation (shown as a light blue area). If a crisis (i.e., banking, currency, or debt crisis) occurs during a rapid debt accumulation period or within two years since the end of the period, it is regarded as an episode of rapid debt accumulation associated with a crisis (shown as a red line). An ongoing episode (e.g., the third orange area in Panel C) is also classified as either rapid or non-rapid accumulation, based on the same methodology.
Click here to download data and charts.

# ANNEX 4.1 Event study methodology

**Identifying episodes of rapid debt accumulation.** The identification of episodes of rapid accumulation of government and private debt proceeds in two steps. First, the Harding and Pagan's (2002) algorithm is used to identify the cyclical turning points in the debt-to-GDP ratios. In particular, a debt cycle (from one peak debt-to-GDP ratio to the next peak debt-to-GDP ratio) is assumed to last at least five years with a minimum two-year duration of the contraction phase (from peak to trough) and the expansion (or accumulation) phase (from trough to peak).[1] Second, an expansion phase is labeled as a rapid accumulation episode if an increase in debt-to-GDP ratio (from trough to peak) exceeds the maximum ten-year moving standard deviation (over the period t-9 to t) of the debt-to-GDP ratio during the phase (Figure A4.1.1).

In scaling debt by GDP, this approach implicitly focuses on the concept of debt burden, which captures the ability of borrowers to repay their debt.[2] An increase in the debt burden, as measured by the debt-to-GDP ratio used here, could reflect an output collapse, an exchange rate depreciation, or outright borrowing. Regardless of these underlying reasons, an increase in the debt burden makes it more challenging to service debt and makes the debt burden more likely to become a source of financial or economic stress.

In practice, output contractions are the source of increases in debt-to-GDP ratios only in a minority of episodes identified here (one-third of government debt episodes and two-fifths of private debt episodes). Currency crises are indeed associated with larger debt buildups during the debt accumulation episodes identified here, but these currency crises typically happen well before (two years before) debt peaks and the increase in debt during the year of the currency crisis only accounts for one-tenth (private debt episodes) to one-quarter (government debt episodes) of the total debt buildup during these debt accumulation episodes associated with currency crises.

Phases at the beginning and end of data series are also classified as either rapid or non-rapid accumulation, if they are on the expansion trajectory. While they are identified in the same way as in the other cases, the beginning and end of episodes are set when data availability of government and private debt begins and ends.

An episode of rapid debt accumulation is associated with a financial crisis if a crisis—banking, currency, or debt crisis—occurs during the period of rapid debt accumulation or at least within two years since the end of the episode. The

[1] This dating method is documented in Kose, Nagle, Ohnsorge, and Sugawara (2019).

[2] Debt buildup results from both demand and supply factors. Regardless of which of these predominates, a high debt-to-GDP ratio presents a vulnerability in the event of adverse shocks.

**ANNEX TABLE 4.1.1 Comparison of combined government and private debt accumulation episodes with solely government or private debt accumulation episodes.**

| | Rapid accumulation with crises | | | Rapid accumulation without crises | | |
|---|---|---|---|---|---|---|
| | Government debt | Private debt | Both (combined) | Government debt | Private debt | Both (combined) |
| Duration (years) | **7** | **8** | 3 | **7** | **8** | 4 |
| Amplitude (percentage points) | **42.6** | **13.1** | 35.3 | **21.6** | **14.8** | 26.0 |
| Growth (percent) | 2.2 | 3.7 | 2.7 | 4.1 | **4.6** | 4.2 |
| Per capita growth (percent) | **0.1** | 1.9 | 0.9 | 2.0 | **2.5** | 2.0 |
| Investment growth (percent) | 1.9 | **5.7** | 2.2 | 6.3 | **7.2** | 6.1 |
| Private consumption growth (percent) | 2.5 | **4.0** | 2.9 | 4.1 | **4.8** | 4.2 |
| Reserves (percent of GDP) | 7.2 | 7.2 | 6.6 | 12.9 | 13.2 | 12.9 |
| Short-term external debt (percent of GDP) | 4.4 | 4.8 | 4.3 | 3.9 | 3.7 | 3.8 |

Note: Amplitude for "Both (combined)" is measured as an average of amplitudes of government debt and private debt during a combined part. Bold numbers indicate statistically significant difference from combined episodes.

information on crisis years is obtained from Laeven and Valencia (2018). The year coverage for currency crises is extended to 2018, by following the methodology in Laeven and Valencia (2018) using data on end-of-year exchange rates vis-à-vis U.S. dollars from the IMF. This association only describes the timing or coincidence between rapid accumulation of debt and financial crisis, and therefore does not imply any causal link between the two.

**Sample.** The sample includes data for 100 EMDEs for 1970-2018, while the identification of debt accumulation uses data prior to 1970 (see Kose et al. 2019 for details). Small states, as defined by the World Bank, are excluded. This results in 256 episodes of rapid *government debt* accumulation and 263 episodes of rapid *private debt* accumulation in a sample of 100 EMDEs with available data for 1970-2018.

## ANNEX 4.2 Regression methodology

**Discrete choice modelling.** The most common estimation methods used in the empirical literature on predicting crises are logit and probit models. The baseline specification used in this study is a panel logit model with random effects, but for robustness purposes, a random effects probit model and a fixed effects logit model are also used. The Hausman test suggests that the random effects model is appropriate for debt and banking crises but not for currency crises. However, even for currency crises, the coefficient estimates and their statistical significance remain similar in fixed effects and random effects models. To exploit the time and cross-sectional dimensions, a panel dataset of 139 EMDEs with annual data over the period 1970–2018 is constructed. The details of the methodology are described in Kose et al. (2019).

**Selection of explanatory variables.** The variables are chosen from a close examination of the empirical findings from the early warning crisis literature (see Chamon and Crowe 2012; Frankel and Saravelos 2012; and Kaminsky, Lizondo, and Reinhart 1998 for an extensive review). A large number of variables is included (with various data transformations, such as levels, growth rate, percentage point change, deviation from trend) that can be grouped into several categories:

- Debt profile: public and private debt (percent of GDP); short-term debt and concessional debt (in percent of total debt); debt service on external debt (in percent of exports).
- Capital account: international reserves (in months of imports), currency mismatch (foreign liabilities to foreign assets), net FDI inflows (in percent of GDP).

- Current account: exchange rate overvaluation (percent deviation from Hodrick Prescott-filtered trend).
- Foreign environment: U.S. interest rate (deflated by GDP deflator, in percent).
- Domestic environment: GDP growth (in percent).
- Banking sector: funding ratio (banking system credit to deposits);

To attenuate potential endogeneity bias caused by contemporaneous interaction between economic fundamentals and crises, lagged values of the explanatory variables are used, except for U.S. interest rate. Robustness checks using alternative model specifications as well as results for probabilities of twin and triplet crises are provided in Kose et al. (2019).

**Probability of crises.** The probability of crises occurring are evaluated at specific points of interest for illustration (while keeping all other variables at their average values). For details, see Kose et al. (2019).

## ANNEX 4.3 Case studies

The in-depth literature review of Box 4.3 covered 43 crisis case studies for 30 EMDEs since 1970. While non-exhaustive, the case studies were chosen to: (i) be representative of debt accumulation episodes over the past fifty years; (ii) include the large EMDEs in major regional debt crises episodes; (iii) represent crises in low-income countries; and (iv) a sufficiently comprehensive literature to base an assessment on.

In the case of the in-depth literature review, the search covered all publicly available country reports and flagship publications of international financial institutions (Asian Development Bank, African Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank, International Monetary Fund, World Bank) and academic publications published during 1970-2018. Publications were found on the institutions' websites and, especially before 1997, in the EconLit database. The main sources are detailed in Kose et al. (2019).

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