

LOOSE FINANCIAL CONDITIONS, RISING LEVERAGE, AND RISKS TO MACRO-FINANCIAL STABILITY

Chapter 2 at a Glance

- Leverage in the nonfinancial private sector reached historical highs for many economies in the run-up to the COVID-19 crisis, reflecting easy financial conditions in the aftermath of the global financial crisis.
- Leverage has since increased even further as policymakers have stepped in to prevent disruption to the flow of credit to households and firms.
- While loose financial conditions are still needed to support a nascent recovery, they could exacerbate the buildup of leverage and increase downside risk to future economic activity.
- Policymakers thus face a trade-off between boosting growth in the short term by facilitating an easing of financial conditions and containing downside risk further down the road. This trade-off may be amplified by the existing high and rapidly building leverage, further increasing downside risks to future growth.
- Policymakers need to be mindful of the financial stability risks stemming from high leverage in the post-COVID-19 environment and should stand ready to tighten macroprudential policies as the recovery takes hold.
- Targeted macroprudential policies that “lean against the wind”—that is, mitigate the adverse effects of loose financial conditions—can help contain or even reverse leverage buildups and improve the intertemporal trade-off, thereby reducing risks to future financial stability.
- The appropriate timing for deployment of macroprudential tools should be country-specific, depending critically on the pace of recovery, postcrisis vulnerabilities, and the policy toolkit available to policymakers. However, given the possible lags between activation and full impact, policymakers should take early action to tighten selected macroprudential tools to address rising financial vulnerabilities.

Nonfinancial firms and households (the nonfinancial private sector) across many economies came into the coronavirus disease (COVID-19) crisis with historically high levels of leverage on the back of relatively loose financial conditions.¹ Those conditions were brought on in part by highly accommodative monetary policies that have been pursued by major central banks since the global financial crisis. While the extraordinary monetary and fiscal policy support in response to the COVID-19 shock has certainly helped to cushion its impact, leverage in the nonfinancial sector has increased further in both advanced and emerging market economies. To assess potential threats

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¹The nonfinancial private sector in the chapter comprises two major sectors: nonfinancial firms and households. That is, it excludes both the financial sector and the government sector. Throughout the chapter, the shorthand “nonfinancial sector” is used.

to the post-pandemic economic recovery, this chapter draws on data for major advanced and emerging market economies to examine the risks of high and rapidly rising leverage for macro-financial stability. The chapter’s analysis shows that loosening financial conditions tend to accelerate buildups in leverage. This is relevant because high growth or high levels of leverage further complicate the challenging intertemporal trade-off faced by policymakers. That trade-off arises because loose financial conditions, while providing a short-term boost to growth, also contribute to heightening downside risks to growth in the medium term. By leaning against the wind, macroprudential policy has an important role to play to temper leverage buildups and strengthen resilience, thus mitigating future financial stability risks. In the current context, while policy support remains necessary in the near term to aid economic recovery, policymakers should be mindful of the increasing macro-financial stability risks resulting from high leverage levels. Considering the possible lags between implementation and full impact, policymakers should

take early action to tighten selected macroprudential tools to address rising nonfinancial sector vulnerabilities. As the nonbank financial sector takes on an expanding role in providing financing to the nonfinancial sector, urgent efforts should be made to develop the toolkit for this sector. Finally, given the challenges to designing and operationalizing macroprudential tools within existing frameworks, policymakers should consider whether buffers need to be built elsewhere to protect the financial system.

Introduction

The nonfinancial sector came into the COVID-19 pandemic crisis with historically high levels of leverage, defined as the reliance on debt in relation to income. On the back of highly accommodative monetary policies pursued by major central banks that have eased financial conditions since the global financial crisis, nonfinancial sector debt worldwide increased from 138 percent to 152 percent of GDP over the decade leading up to the end of 2019 (Figure 2.1, panels 1 and 2).² Nonfinancial corporate sector debt increased in both advanced and emerging market economies, reaching a historical high of 91 percent of GDP at the end of 2019 (Figure 2.1, panel 1).^{3,4} Household debt, by contrast, rose sharply

²The global nonfinancial sector debt-to-GDP ratio is computed here as the sum of nonfinancial sector debt for 52 economies reporting to the Institute of International Finance divided by the sum of GDP for those economies, with both the numerator and denominator expressed in US dollars. The corresponding ratios for nonfinancial firms and households, as well as for advanced economies and emerging markets, are calculated in a similar fashion. While country-specific structural factors (such as continued financial liberalization and financial development, as well as demographic shifts) may have contributed to the rise in nonfinancial sector debt in some cases, studies note the predominant role of loose global financial conditions in driving nonfinancial sector leverage since the global financial crisis (for example, see Chapter 3 of the October 2015 GFSR; OECD 2017; Alter and Elekdag 2020).

³Nonfinancial corporate debt includes that of state-owned enterprises, defined as firms in which the state owns positive equity. For some emerging markets in the sample, the share of state-owned enterprises in nonfinancial corporate debt is quite substantial (exceeding 60 percent). The nonfinancial corporate data shown in Figure 2.1 are for nonconsolidated debt, as presented by the Institute of International Finance. Data on consolidated debt are less widely available. In countries for which both consolidated and unconsolidated data are available, the consolidated figures are often noticeably lower, but have followed trends similar to the unconsolidated figures over time.

⁴In many systemically important economies, the rise in nonfinancial corporate debt over the past decade was accompanied by weaker credit quality of borrowers, looser underwriting standards, and increased interconnectedness (April 2020 GFSR, Chapter 2).

among emerging market economies but fell in advanced economies as a group, reaching 60 percent worldwide at the end of 2019 (Figure 2.1, panel 2).

The COVID-19 shock has further increased nonfinancial sector leverage across economies, albeit for different reasons. The crisis has squeezed cash flows for the corporate sector and, through its impact on employment, increased the financing needs of households. The unprecedented and warranted monetary and fiscal policy support launched during the containment phase of the pandemic has eased market dysfunction, loosening financial conditions after a sharp tightening in the first quarter of 2020, and maintained the flow of credit to households and firms (October 2020 *Global Financial Stability Report* [GFSR], Chapter 3; October 2020 *Fiscal Monitor*). Policy support has also enhanced their ability to repay, thus allowing them to avoid having liquidity pressures morph into solvency issues. However, this has come at the expense of increased debt levels for most economies (Figure 2.1, panels 1 and 2). Global nonfinancial corporate and household debt increased by 11½ percentage points and 5 percentage points of GDP, respectively, between the end of 2019 and the third quarter of 2020.⁵ While sharp declines in output, particularly in emerging markets, have undoubtedly contributed to the recent increase in debt-to-GDP ratios, there has also been a visible rise in debt levels during the COVID-19 crisis (Figure 2.1, panels 3 and 4).⁶

Historically, a rapid accumulation or high level of nonfinancial sector leverage has often preceded financial and economic downturns (see the literature review in Online Annex Box 2.1).⁷ To the extent that buildups in leverage are facilitated by easy financial conditions, policymakers grappling with the adverse economic effects of the current crisis may soon face a trade-off associated with their choices. While an accommodative policy stance is appro-

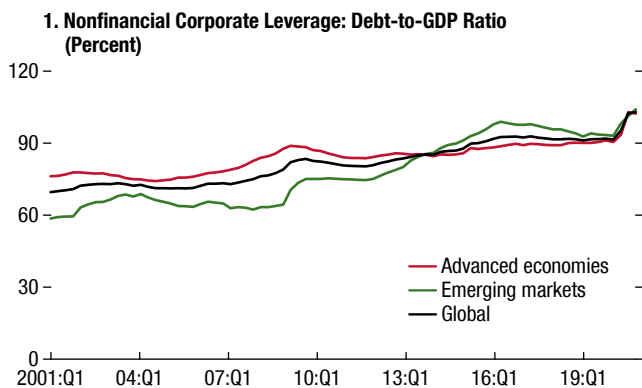
⁵As noted in Chapter 1, the increase in nonfinancial corporate leverage during the pandemic shock has been across the board, though firms in the sectors most affected by the pandemic crisis—such as energy, consumer services, and commercial real estate—have experienced the greatest increase. Across regions, the highest levels of leverage have been registered in the Asia-Pacific and European regions, and the largest increases in leverage during the COVID-19 crisis have been in the Middle East and Central Asia (see Online Annex Figure 2.1.1).

⁶By comparison, during the decade leading up to the COVID-19 pandemic, the contribution of GDP to the debt-to-GDP ratio was negative.

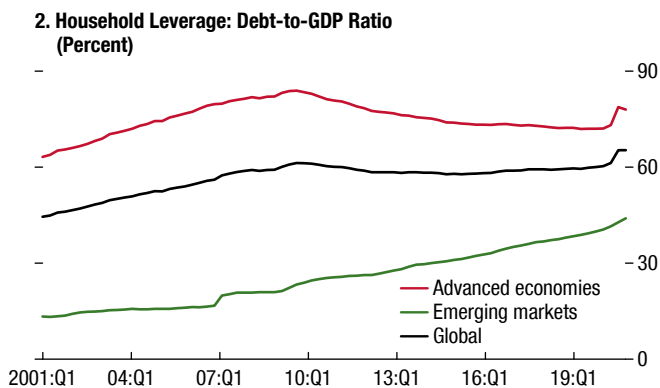
⁷All online annexes are available at www.imf.org/en/Publications/GFSR.

Figure 2.1. Nonfinancial Sector Leverage, by Country Group, 2001:Q1–20:Q3

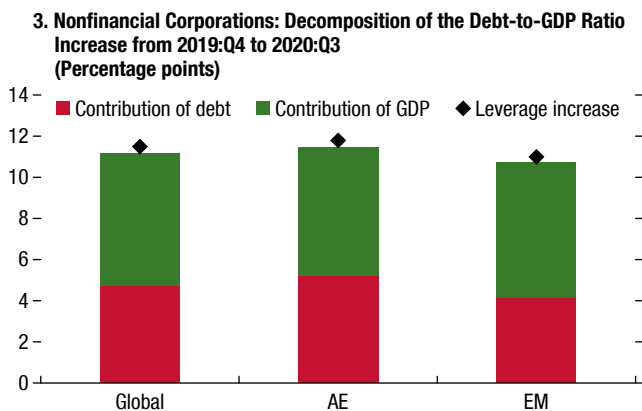
Nonfinancial corporate sector leverage increased in the decade preceding the COVID-19 crisis, and increased further during the crisis ...



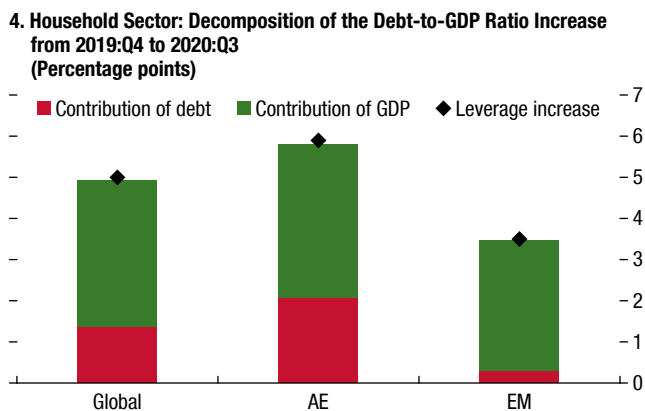
... while household sector leverage also rose strongly in emerging markets.



Output declines explain some, but not all, of the increase in nonfinancial corporate debt-to-GDP ratios during 2020 ...



... while explaining much of the increase in household debt-to-GDP ratios in emerging markets.



Sources: Institute of International Finance; and IMF staff calculations.

Note: The figure includes 27 advanced economies (AE) and 25 emerging markets (EM). Leverage is measured as the ratio of debt to GDP. Global, AE, and EM leverage is measured as the ratio of aggregate debt to aggregate GDP across different country groups. Nonfinancial corporate debt figures are nonconsolidated.

appropriate at this juncture to ease financial conditions and stimulate aggregate demand in economies facing recessions and large negative output gaps, continued extraordinary policy support once the recovery takes hold risks adding to the already elevated leverage vulnerabilities. Furthermore, such extraordinary support could induce excessive risk taking arising from moral hazard under an expectation of continued central bank interventions.⁸

⁸As noted by Borio and Zhu (2012), leverage and risk in the financial sector tend to increase with lower policy rates. Adrian and Liang (2018) discuss in detail how accommodative monetary policy can loosen current financial conditions, but at the cost of increasing future financial vulnerabilities. Hanson and others (2020) point out a potential moral hazard, in that the private sector may misperceive government support actions, believing that they will be repeated in the future under different situations.

Thus, an intertemporal trade-off arises, in the sense that the support to near-term economic activity may lead to increasing downside risks in the medium term. This trade-off may be amplified by high or increasing leverage, for example, if new credit is allocated to riskier borrowers.⁹

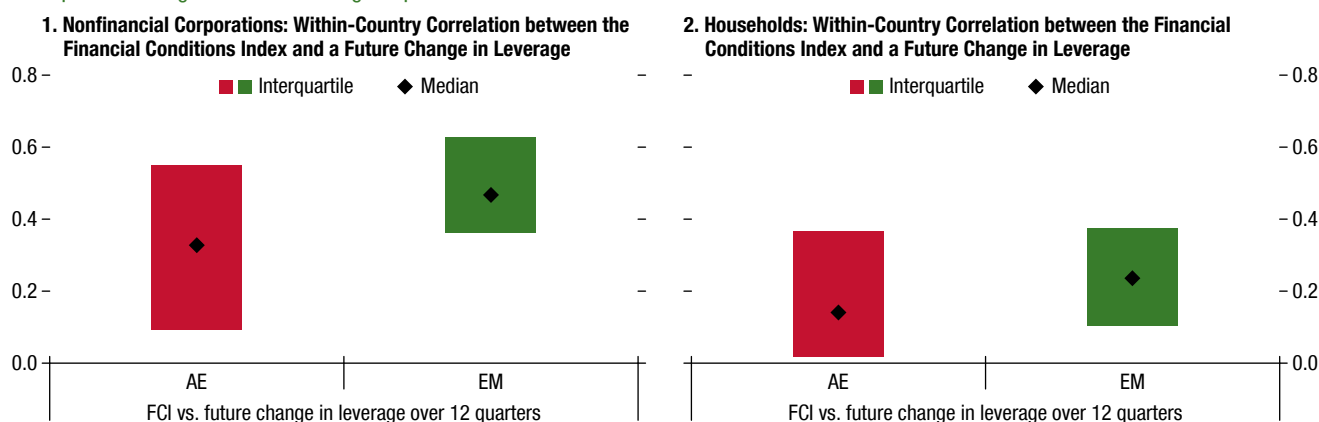
A simple look at the data supports the two relationships that are central to the intertemporal trade-off. First, loose financial conditions are associated with substantial buildups in leverage—for example, over the subsequent

⁹Brandao-Marques and others (2019), for instance, show that the riskiness of credit allocation increases downside risks to GDP growth.

Figure 2.2. Leverage, Financial Conditions, and Output Growth

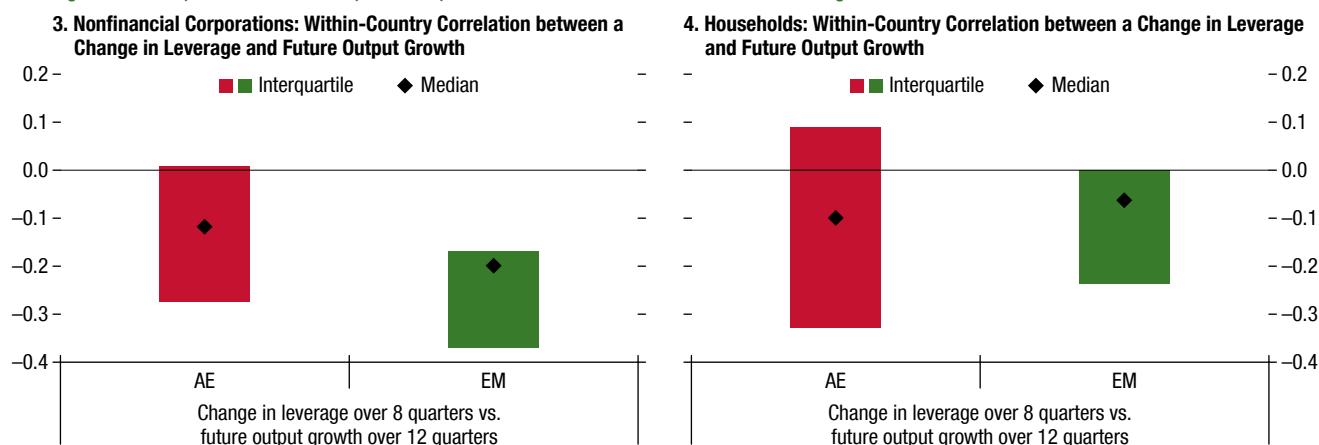
Loose financial conditions tend to be associated with greater increases in corporate leverage over the following 12 quarters ...

... and with increases in household leverage.



Periods of strong growth in corporate leverage are often followed by lower growth in output over the subsequent 12 quarters ...

... and growth in output also slows after periods of strong growth in household leverage.



Sources: Institute of International Finance; and IMF staff calculations.

Note: The sample includes 19 advanced economies (AE) and 10 emerging markets (EM). Panels 1 and 2 show the correlation of the negative of the Financial Conditions Index (FCI) (that is, higher values indicate looser financial conditions) and changes in the debt-to-GDP ratio over the subsequent 12 quarters. Panels 3 and 4 show the correlation of a change in the nonfinancial corporate sector and household debt-to-GDP ratio, respectively, over 8 quarters and a change in output growth over the subsequent 12 quarters. The picture remains similar if correlation is computed over other horizons (such as using a change in debt-to-GDP ratio over 12 quarters).

12 months—in both advanced and emerging market economies (Figure 2.2, panels 1 and 2).¹⁰ Second, there is a visible negative relationship between an increase in leverage and future economic activity. Stronger buildups in leverage tend to be followed by

more subdued economic activity over the subsequent 12 quarters in both advanced and emerging market economies (Figure 2.2, panels 3 and 4). These observations suggest that the intertemporal trade-off posed by easy financial conditions may be highly relevant as the recovery gains momentum, with sharply increasing levels of leverage.

Against this backdrop, this chapter draws on data from the past three decades for a sample of 29 economies (19 advanced economies and 10 emerging markets) to investigate through more formal econometric analysis the implications of the current elevated levels of leverage, as well as the rapid leverage buildup, for

¹⁰Financial conditions are measured by the Financial Conditions Index (FCI) used in Chapter 1 of this issue of the GFSR. The country-specific FCIs are based on a principal component analysis of 11 variables—including real short-term interest rates, equity prices, sovereign and corporate debt spreads, the exchange rate, and real house prices—to capture the price of risk (see Online Annex 1.1 of the October 2018 GFSR). An increase (decline) in the index denotes tighter (looser) financial conditions; that is, an increase (decline) in the price of risk. For Figure 2.2, the negative of the FCI (that is, higher values indicate looser financial conditions) is used.

a post-COVID-19 recovery.¹¹ Fully acknowledging that for most countries continued policy support to the flow of credit and to economic activity will be needed in the foreseeable future, the chapter adopts a forward-looking view to flag the potential risks to macro-financial stability that may arise due to elevated leverage once the recovery is self-sustaining and broad policy support is no longer essential. A timely recognition of such risks may assist policymakers in planning a post-COVID exit from these policies and swiftly deploying tools to counter these risks when economic conditions permit.

The chapter's analysis centers on the interactions among financial conditions, nonfinancial sector leverage, and macro-financial stability. It focuses on the implications of loose financial conditions for leverage buildups and, in turn, on how high or rapidly increasing leverage interacts with relaxed financial conditions to affect financial stability risks. Based on the work of previous GFSRs and of Adrian and others (2019), the chapter adopts a growth-at-risk (GaR) approach, whereby risks to financial stability are reflected in the downside forecast of future economic activity—that is, financial distress is expected to ultimately translate into sharper economic downturns in the future.¹² In addition, it distinguishes between corporate and household leverage to better understand any differences in their dynamics, and also separates

out advanced and emerging market economies to account for specificities in these economies.¹³

Thus, with the post-COVID-19 recovery in mind, the chapter investigates the following key questions:

- **How do financial conditions affect leverage?** What is the role of financial conditions in the buildup of nonfinancial corporate and household leverage? Does the recent growth in leverage matter?
- **What are the implications of leverage for financial stability?** What role, if any, does leverage play in the intertemporal trade-off faced by policymakers between boosting growth in the short term by easing financial conditions and containing downside risk further down the road?
- **Can macroprudential policies help mitigate the trade-off?** Can such policies be used to increase resilience and lean against the wind, limiting buildups in leverage and mitigating the medium-term downside risk to activity given the level of leverage? What are the lessons for policymakers at the current juncture?

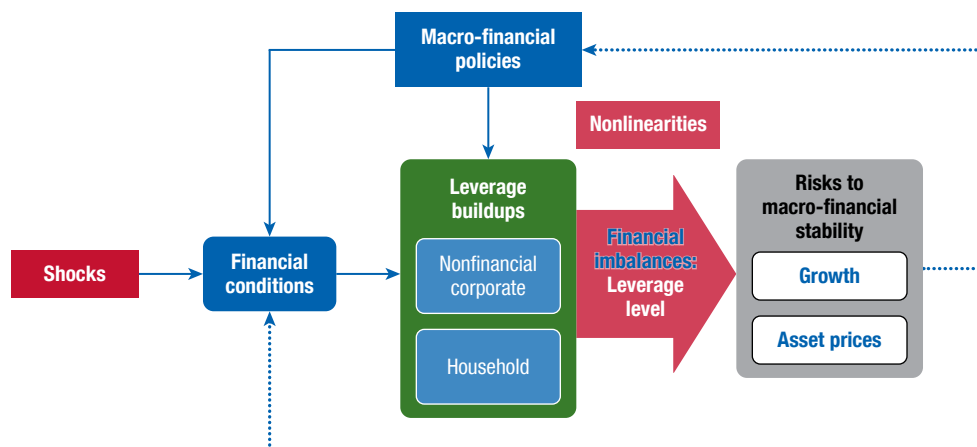
Conceptual Framework

To better understand the challenges that may arise once a sustainable recovery is in place and unprecedented policy support is gradually withdrawn, it may be useful to briefly discuss the conceptual framework behind the analysis. As shown in Adrian and others (2019), leverage, financial conditions, and macro-financial stability are tightly intertwined. Financial conditions, which reflect the price of risk in an economy, constitute a key driver of leverage buildups (Figure 2.3). When financial conditions are loose, intermediaries and markets have a greater incentive to take on more risk and a greater capacity to lend. At the same time, borrowers (firms and households) have a greater incentive to take on debt and, through heightened net worth associated with higher asset values, a greater capacity to borrow. Macro-financial policies (monetary, macroprudential, and fiscal) also have an effect on leverage buildups, either through financial conditions and the availability of credit

¹¹The economies in the sample are selected primarily for their globally systemic importance and availability of data—in particular, of disaggregated nonfinancial sector leverage and financial conditions indices. The 29 economies are Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Denmark, Finland, France, Germany, Hong Kong SAR, India, Italy, Japan, Korea, Malaysia, Mexico, The Netherlands, Norway, Russia, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. The sample period is from 1996:Q1 to 2020:Q3. The analysis does not cover low-income countries, and it is not entirely obvious that its implications would apply to most low-income countries, where financial development is relatively low, and episodes of rapid credit growth may reflect financial deepening rather than disruptive credit expansion. For example, Eberhardt and Presbitero (2018) show that commodity price shocks, rather than surges in credit or capital flows, tend to predict banking crises in low-income countries. However, as financial sectors in these economies continue to develop, the potential for loose financial conditions and nonfinancial sector leverage to have financial stability implications will increase as well.

¹²The GaR approach in this chapter focuses on the lower tail (10th percentile) of the distribution of future economic growth. For a description of the GaR framework, see Adrian and others (forthcoming) and Prasad and others (2019).

¹³Recent relevant studies include Mian, Sufi, and Verner (2017), which show that shocks to household leverage provide a short-term boost to output followed by a longer-term negative effect, but shocks to nonfinancial corporate leverage do not produce a short-term boost because the corporate debt overhang limits firm investment and future growth. In a similar vein, Jordà and others (2020) find a depressive effect of nonfinancial corporate leverage on future growth in economies with inefficient firm resolution processes, which facilitate the survival of “zombie” firms.

Figure 2.3. Leverage as an Amplifier of Shocks

Source: IMF staff, based on Adrian and others 2019.

Note: “Nonlinearities” indicates that the impact of financial conditions on macro-financial stability may be amplified in the presence of elevated financial vulnerabilities, such as a high level of leverage.

or through the effects of policies on factors such as income, unemployment, inflation, and debt service costs.¹⁴ Macroprudential policies in particular can help to lean against the wind—that is, tighten to lessen risks to future financial stability. These policies can accomplish this objective by taming leverage buildups or by strengthening borrower and lender resilience.

Leverage buildups can represent a financial vulnerability, as high levels of indebtedness cause households and firms to become more susceptible to adverse shocks. When these shocks arise and financial conditions tighten, financial stability risks may arise from an abrupt correction of asset prices and rapid deleveraging by firms and households. The combination of a repricing of risk and elevated leverage can generate pernicious nonlinearities, whereby tighter financial conditions interact with deleveraging, which in turn causes additional repricing of risk. The higher the level of indebtedness before the shock, the greater the likelihood of such deleveraging

¹⁴While monetary policy is generally considered to be the main policy-related driver of financial conditions, thereby affecting nonfinancial sector leverage, fiscal policy can also influence leverage through several channels. Fiscal measures such as grants to households or subsidies to nonfinancial firms, by reducing their financing needs, can help dampen leverage buildups. At the same time, measures such as loan guarantee programs for nonfinancial firms, favorable tax treatment of interest expenses, and accelerated depreciation for tax purposes could all incentivize nonfinancial sector borrowing. More broadly, public spending can “crowd out” private borrowing by raising interest rates (see, for example, Furceri and Sousa 2011), though a “crowding-in” effect is also possible if public spending stimulates aggregate demand, particularly during recessions (Auerbach and Gorodnichenko 2012).

becoming highly disruptive. Thus, leverage can act as an amplifier of adverse shocks, as shown by Kiyotaki and Moore (1997); Bernanke, Gertler, and Gilchrist (1999); and Brunnermeier and Sannikov (2014). In addition to the level of leverage, the growth of leverage may matter as well—possibly magnifying the effect of a shock if, for example, new lending is extended to riskier borrowers.¹⁵

Financial Conditions and Nonfinancial Sector Leverage

Empirical analysis shows that, controlling for other drivers, looser financial conditions are indeed associated with an increase in nonfinancial sector leverage in the near and medium term.¹⁶ Across all economies

¹⁵For instance, Brandao-Marques and others (2019) find that credit expansion under loose financial conditions is more likely to involve increased riskiness of credit allocation, which is associated with greater downside risks to future growth. While the debt-to-GDP ratio has limitations, in that it may not fully reflect the stability consequences of debt, it is the preferred measure here due to greater data availability. Other dimensions of debt—such as its currency composition and maturity, as well as the borrowers’ debt servicing capacity—may also be relevant (Drehmann and Juselius 2014; Du and Schreger 2016). Available data suggest that despite loose financial conditions, debt servicing capacity has declined for many countries since the global financial crisis, while the share of foreign currency debt in total nonfinancial corporate debt has increased for many emerging markets. The macro-financial stability implications of these dimensions, as well as that of debt net of cash holdings and other highly liquid assets, are explored in Barajas and others (forthcoming).

¹⁶The results presented in this section are obtained from local projection regressions of changes in leverage (debt-to-GDP ratio) at various horizons on the FCI, control variables, and time fixed effects. See Online Annex 2.2 for further details. These estimates may not

in the sample, an easing in financial conditions by one unit is followed by an increase in nonfinancial corporate debt by 4 percentage points of GDP over three years (Figure 2.4, panel 1).¹⁷ A loosening of financial conditions also boosts household leverage, although the association is smaller than for nonfinancial firms, with a one-unit loosening of financial conditions implying an increase in household leverage by 1½ percentage points of GDP over a three-year horizon (Figure 2.4, panel 2).¹⁸

One important question is whether an easing of financial conditions has different implications for leverage buildup depending on the pace of debt accumulation or the level of leverage. The analysis shows that the increase in leverage in response to financial conditions is indeed nonlinear. That is, an easing of financial conditions during a credit boom—defined as sharp growth in the credit-to-GDP ratio in the context of already easy financial conditions—is followed by a larger increase in leverage than in periods without a boom (Figure 2.4, panels 3 and 4).¹⁹ In addition, there

necessarily imply causation because prospects of future changes in leverage could affect current financial conditions. However, several additional model specifications were estimated to mitigate these endogeneity concerns, with broadly similar results. These specifications included (1) purging macroeconomic factors from the FCI; (2) using a global FCI or the Chicago Board Options Exchange Volatility Index (VIX) (both of which are unlikely to be driven by domestic leverage for most countries in the sample); (3) undertaking a panel vector autoregression (PVAR), which is a system estimation of leverage, financial conditions, and output; and (4) removing cyclical components over the duration of the business cycle (6 to 32 quarters) from real GDP (in log), leverage, and the FCI. See Online Annex 2.2 and Online Annex Box 2.2 for further details.

¹⁷A one-unit decline in the FCI is comparable to the average loosening in financial conditions observed across the economies in the sample between the end of 2020:Q1 and the end of 2020:Q4. The effects reported here are broadly similar across advanced and emerging market economies, though in the latter case, nonfinancial corporate leverage appears to react more strongly to financial conditions. Changes in nonfinancial sector debt-to-GDP ratios may not be driven entirely by changes in debt but could also be affected by fluctuations in GDP. Using growth in inflation-adjusted debt as an alternative variable yields qualitatively similar results.

¹⁸When including measures of global financial conditions—the VIX or a global FCI—along with country-specific financial conditions in the regressions, the coefficients on these measures are not significantly different from zero, thus suggesting the dominant role of domestic financial conditions. This result holds for the full sample, as well as for the samples for both advanced and emerging market economies separately. Furthermore, the main results are robust to controlling for fiscal variables, such as the government-balance-to-GDP ratio, to take account of the possible impact of fiscal measures on nonfinancial sector leverage, as discussed earlier in this chapter. See Online Annex 2.2 for a discussion of this empirical exercise.

¹⁹“Credit boom” is defined as a binary variable that takes a value of one if the country-specific FCI is in the bottom half of

is evidence of a stronger association with easing financial conditions when the initial level of leverage is high (that is, in the top three deciles of the debt-to-GDP distribution), particularly for household leverage.

Overall, these results suggest that the loosening of financial conditions is associated with faster leverage buildup, and that this association becomes stronger in times of high credit growth and already loose financial conditions.²⁰ These findings have important implications in the current environment, when credit growth has been elevated and financial conditions are anticipated to remain loose for some time in several economies (as noted in Chapter 1). These implications are explored next.

Macro-Financial Stability Implications of Leverage

This section assesses implications of the easing financial conditions and associated buildup of leverage for financial stability, and thus future economic activity. The analysis looks at the distribution of future economic growth and pays particular attention to the left tail—the 10th percentile—because it represents the most adverse outcomes (that is, downside risk).²¹ A one-unit loosening of financial

its distribution (a lower FCI represents looser financial conditions) and the eight-quarter change in the nonfinancial private sector credit-to-GDP ratio is in the top three deciles of its distribution. The choice of the specific thresholds draws on the literature (see, for example, Adrian and others, forthcoming) but also reflects data specificities such as including a sufficient number of credit boom cases in the estimations for meaningful analysis. Notably, with this definition, about 25 percent of the economies in the sample are in the credit boom regime in 2020:Q3. These results are robust to alternative definitions of credit booms (such as using the bottom three deciles for the FCI and the upper three deciles for the change in leverage).

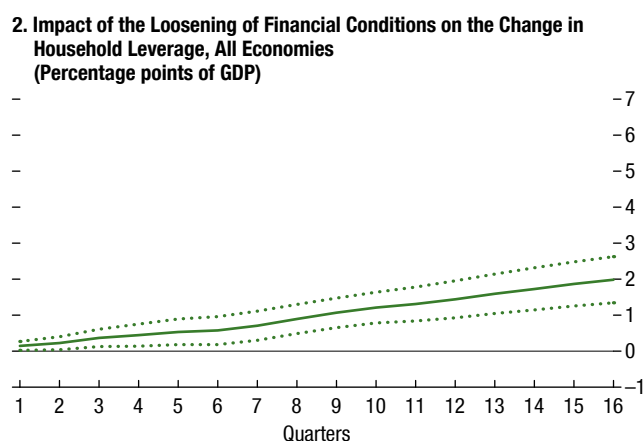
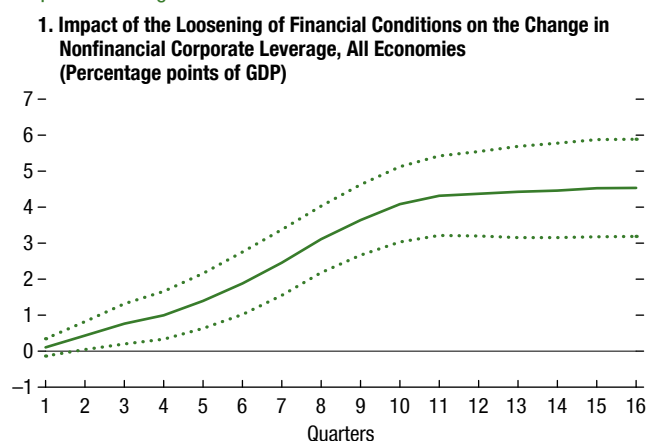
²⁰The greater sensitivity of leverage buildups to financial conditions when debt is already increasing rapidly is in line with the standard financial accelerator mechanism, according to which financial frictions can amplify the effects of shocks through their effect on net worth (Bernanke, Gertler, and Gilchrist 1999). Moreover, this stronger reaction is also suggestive of a risk-taking channel through which the effects of shocks on macro-financial outcomes are amplified in times of high credit growth.

²¹An increase (decrease) in the 10th percentile of future growth of output corresponds to a reduction (increase) in downside risk. The results presented in this section are derived from a quantile local projection model with real GDP growth (year over year) at various future horizons as the dependent variable and with the FCI, changes in household and nonfinancial corporate leverage (over eight quarters), and other controls as explanatory variables. As with the regressions for leverage growth in the previous section, the results are robust to alternative specifications aimed at addressing potential endogeneity concerns and to the inclusion of fiscal variables. See Online Annex 2.3 for further details.

Figure 2.4. Association between Easing Financial Conditions and Nonfinancial Sector Leverage

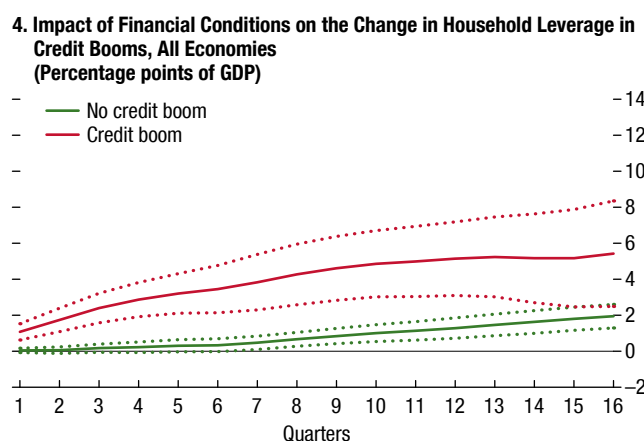
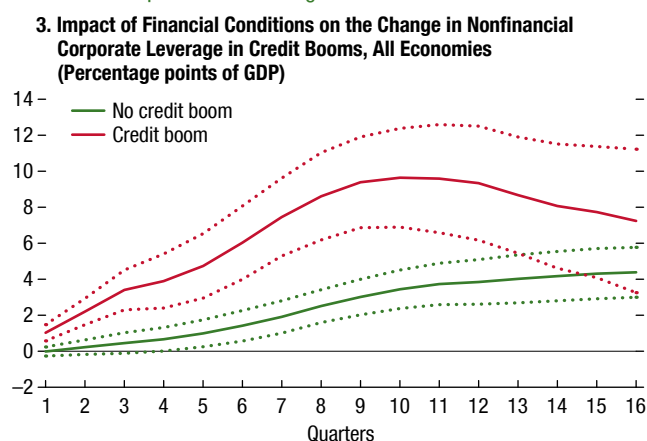
Looser financial conditions are associated with a larger increase in corporate leverage ...

... as well as household leverage.



This relationship intensifies during credit booms both for firms ...

... and households.



Sources: Institute of International Finance; and IMF staff calculations.

Note: The shock is scaled as a one-unit decrease in the Financial Conditions Index (FCI) to reflect the effect of loosening financial conditions. The dependent variable is the change in nonfinancial corporate or household debt-to-GDP ratios over horizons of 1–16 quarters. The control variables in all regressions are lagged one-quarter changes in the sector-specific debt-to-GDP ratios, lagged GDP growth, the lagged short-term interest rate, lagged inflation, and a global financial crisis dummy. Panels 1 and 2 show linear responses. Panels 3 and 4 show regime-dependent responses in which regimes are based on a credit boom dummy, which takes a value of one when the country-specific FCI is in the bottom half of its distribution (a lower FCI represents looser financial conditions) and the eight-quarter change in the nonfinancial private sector credit-to-GDP ratio is in the top three deciles of its distribution. The dashed lines denote 90 percent confidence intervals. See Online Annex 2.2 for additional details.

conditions is associated with an increase in the 10th percentile of real GDP growth in the near term—amounting to a reduction in downside risk—by 1½ percentage points (Figure 2.5, panel 1).²² After the seventh quarter, however, the boost-to-output

effect vanishes and the downside risk increases by about 1 percentage point.²³

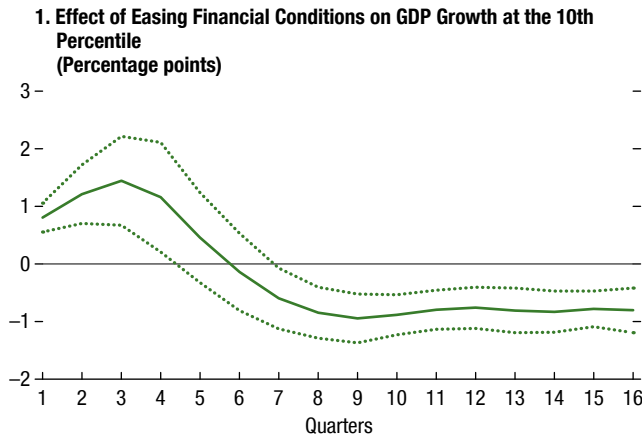
Not only do easy financial conditions imply an intertemporal trade-off in terms of future growth, but the downside risks are also amplified during

²²While the analysis here focuses on the 10th percentile of the distribution of future output growth, the results are similar for median future output growth, suggesting that on average loose financial conditions boost short-term output growth, but the association reverses in the medium term.

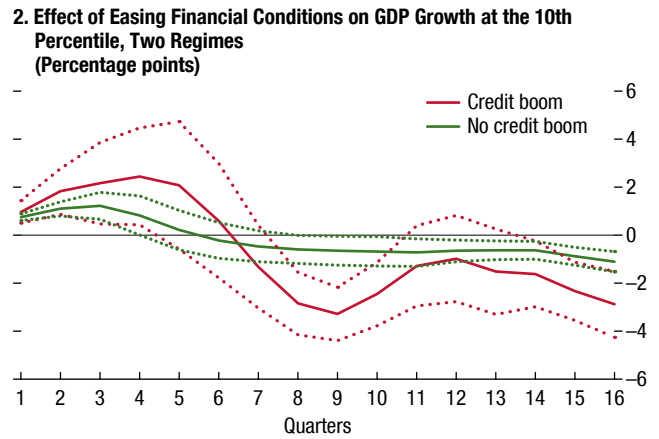
²³Comparing across advanced and emerging market economies, the latter in general appear to experience faster and sharper economic downturns in the medium term. This is consistent with the estimated greater short-term response of nonfinancial sector leverage in emerging markets to loosening financial conditions, thus making these economies more prone to generating financial imbalances that magnify future downside risks.

Figure 2.5. Association between Easing Financial Conditions and Downside Risks to Growth

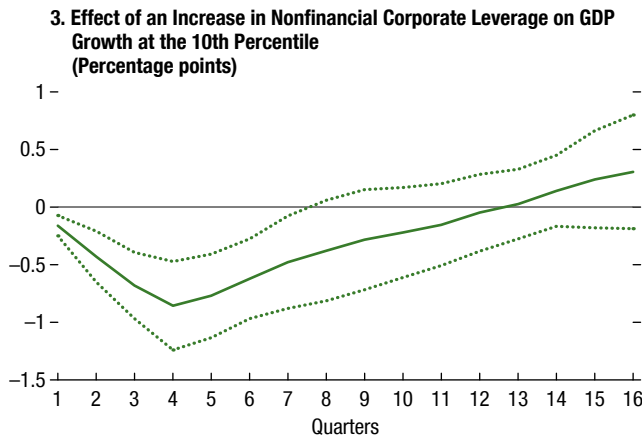
A loosening of financial conditions is followed by a boost to near-term output but an increase in medium-term downside risk.



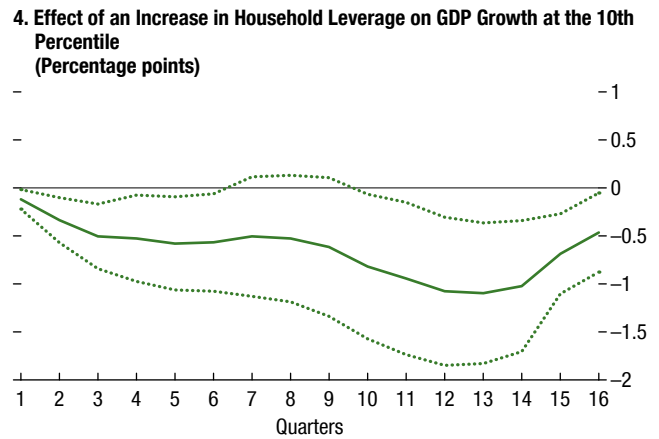
This intertemporal trade-off is amplified during credit booms.



Downside risk increases following a buildup of nonfinancial corporate leverage ...



... and following a buildup in household leverage as well.



Sources: Institute of International Finance; and IMF staff calculations.

Note: The shock is defined as a one-unit loosening in the Financial Conditions Index (FCI). The dependent variable is the year-over-year growth in real GDP over horizons of 1–16 quarters ahead. The control variables in all regressions are the year-over-year GDP growth rate, inflation rate, country-fixed effects, and a time trend. All of the impulse response functions are estimated with a quantile local projections model at the 10th percentile of the growth distributions. In panel 2, the regime variable (credit boom) is defined as episodes when the subsequent eight-quarter change in the nonfinancial sector debt-to-GDP ratio is in the within-country top-three deciles, and financial conditions are below the within-country median. In panels 3 and 4, the shock is defined as a 10 percentage point increase in nonfinancial corporate leverage and household leverage. Dashed lines indicate 90 percent confidence intervals.

credit booms.²⁴ During these episodes, a one-unit loosening in financial conditions is associated with a reduction in near-term downside risk by 2.5 percentage points, but an increase in downside risk by 3.3 percentage points after two years (Figure 2.5, panel 2). As mentioned, this result

may, at least partly, reflect the fact that the riskiness of the borrower pool tends to rise when easy financial conditions are accompanied by rapid credit expansion, which magnifies downside risks to future growth.²⁵

²⁴This finding is consistent with the findings of Adrian and others (forthcoming).

²⁵Barajas and others (forthcoming) further differentiate between credit booms that occur when the economy is booming (proxied by the positive output gap) versus those that occur when the economy is underperforming (proxied by the negative output gap). They find

The analysis also shows that increases in nonfinancial corporate or household leverage are directly associated with downside risks to output, above and beyond the effect of loosening financial conditions (Figure 2.5, panels 3 and 4). A 10 percentage point acceleration in nonfinancial corporate leverage buildup, for example, is associated with an increase in downside risks of about 1 percentage point in the near term. Acceleration in household leverage has a similar association with downside risk, but one that is statistically significant either in the near term or after 10 quarters out.²⁶

Overall, the results show that financial stability risks—reflected in medium-term downside risks to economic activity—tend to be amplified by loose financial conditions and high and rapidly growing leverage of both nonfinancial firms and households—circumstances pertinent at this time for many economies. Policymakers, therefore, need to stay attuned to the emerging financial stability risks as the post-pandemic recovery takes hold.

Macprudential Policy and the Intertemporal Trade-off between a Short-Term Boost and Medium-Term Risks

In the context of the post-COVID-19 recovery, policymakers will soon face two crucial objectives: continuing to limit scarring resulting from the pandemic and guarding against a flare-up in financial stability risks down the road. As discussed in Chapter 1, monetary policy has been and will continue to be essential to providing liquidity and ensuring the continuity of credit availability, thereby working in tandem with fiscal policy to support economic activity.

that the trade-off holds in both cases. In the latter case, however, the boost to output lasts longer, whereas the increased downside risk emerges when the credit boom is accompanied by a positive output gap. Furthermore, recognizing that the ratio of the stock of debt to GDP is not the only relevant dimension of leverage, the analysis finds that episodes with particularly high ratios of debt service to income also exhibit an accentuated downside risk in the medium term.

²⁶Looking across economies, it is apparent that the effect of nonfinancial corporate leverage on downside risks to growth stems mainly from emerging markets, with downside risks increasing significantly by about 2 percentage points in the medium term following a 10 percentage point buildup in leverage. As suggested by Jordà and others (2020), this result may reflect the impact of relatively weaker debt resolution frameworks for firms in emerging markets relative to advanced economies. By contrast, the adverse impact of household leverage on longer-term growth is more robust for advanced economies. These findings support Mian, Sufi, and Verner (2017), who show the negative effect of increasing household and nonfinancial corporate leverage on median future growth. This chapter's results also show that these effects are more pronounced on the left tail of the GDP growth distribution.

Macprudential policy will play the key role in pursuing the second objective: safeguarding financial stability in the future.²⁷

To address the intertemporal trade-off described earlier, macroprudential tools can be used to lean against the wind, as well as to strengthen resilience, by targeting borrowers or lenders.²⁸ For example, Cerutti, Claessens, and Laeven (2017) provide evidence that the tightening of macroprudential policies is associated with lower future growth in domestic credit, particularly household credit. Alam and others (2019) find that two types of measures targeting households—loan-to-value (LTV) and debt-service-to-income (DSTI) ceilings—slow down their debt accumulation. Peydró and others (2020) find that limits on the proportion of high loan-to-income ratios in mortgage lending can lead to less severe house price declines and mortgage defaults during an episode of price correction.

To assess the effectiveness of macroprudential measures in containing the buildup of sector-specific leverage and mitigating downside risks to growth, a range of measures are considered here, including various borrower-based measures as well as measures aimed at bank lenders, such as capital adequacy measures, liquidity measures, and foreign currency exposure.²⁹ Looking across types of financial institutions, it must

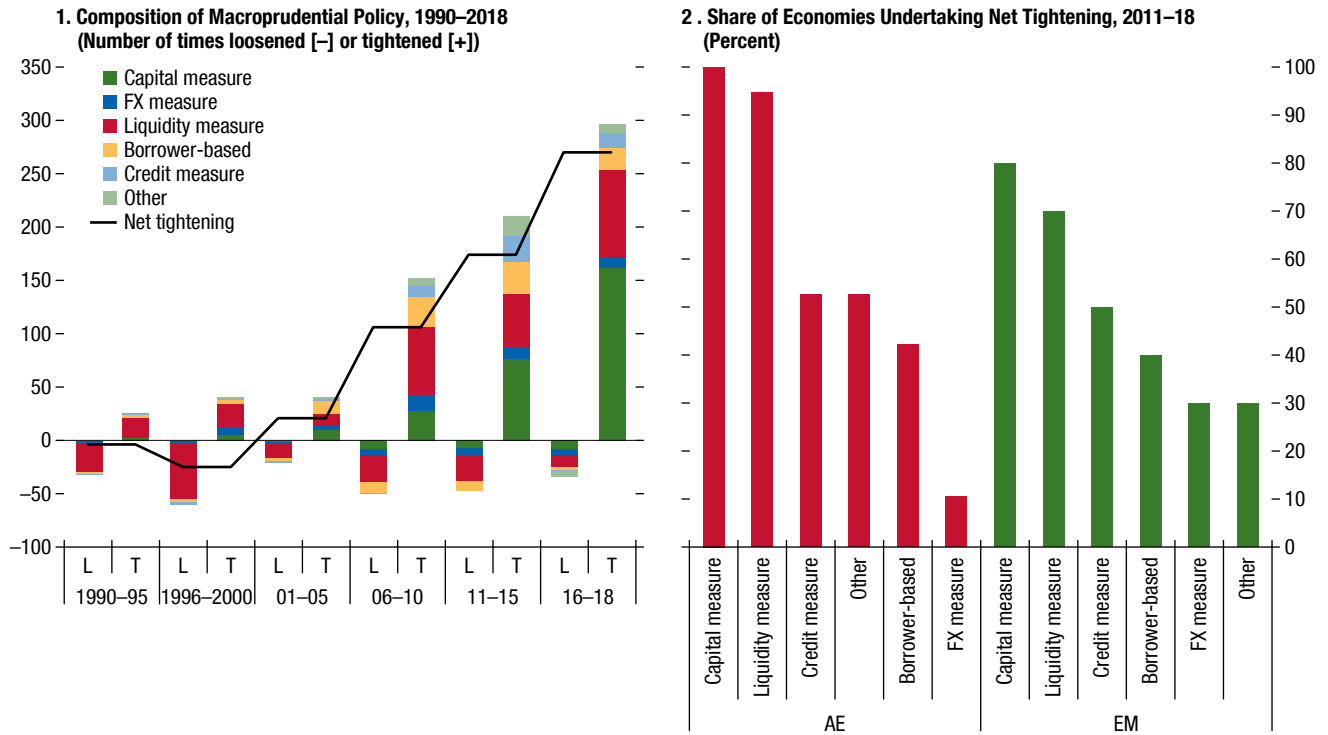
²⁷Recent analysis of the policy mix during the COVID-19 crisis notes that there are important complementarities between monetary and fiscal support and some degree of macroprudential loosening to confront the adverse shock. However, implementation should also bear in mind trade-offs that arise, particularly as the recovery proceeds and it becomes necessary to begin to build sufficient buffers to protect against future shocks (Nier and Olafsson 2020).

²⁸On the borrower side, measures include loan-to-value or debt-service-to-income limits that aim to reduce borrower indebtedness. On the lender side, measures encompass capital or liquidity requirements, limits to credit growth, and foreign currency exposure limits. See Online Annex Box 2.3 for a detailed discussion of the channels through which different macroprudential tools may affect macro-financial stability.

²⁹Information on macroprudential measures is taken from the IMF's Integrated Macroprudential Policy database over the 1990–2018 period (for details, see Alam and others 2019). These measures are grouped into six broad categories: (1) borrower-based measures (LTV and DSTI limits); (2) bank capital measures (capital requirements, leverage limits, loan-loss provision requirements, countercyclical capital buffers, capital conservation buffer requirements, measures targeting systemically important banks); (3) banks' foreign currency exposure measures (limits on foreign currency lending, limits on gross open foreign currency positions, reserve requirements on foreign currency assets); (4) bank liquidity measures (reserve requirements, liquidity requirements, limits to the loan-deposit ratio); (5) credit measures (limits on credit growth, loan restrictions); and (6) other measures (stress testing, restrictions on profit distribution, limits on exposures between financial institutions).

Figure 2.6. Macroprudential Policy Actions, by Category

Macroprudential policy tightening became more frequent following the global financial crisis and has focused primarily on tools related to the capital and liquidity regulations of banks.



Source: IMF, Integrated Macroprudential Policy database.

Note: The sample includes 19 advanced economies (AE) and 10 emerging markets (EM). Panel 1 shows the number of times during which a given category of macroprudential measures was either tightened (positive) or loosened (negative) during each five-year subperiod during 1990–2018. The solid line indicates net tightening; that is, the difference between the number of measures tightened and loosened. Panel 2 shows the share of countries undertaking net tightening over the 2011–18 period for each category and by country group. AE = advanced economy; EM = emerging market economy; FX = foreign exchange; L = loosened; T = tightened.

be noted that the bulk of macroprudential policy tools apply to banks, with almost no tools directed specifically at nonbank financial institutions (NBFIs), which have become increasingly important actors in financial markets and pose additional challenges for financial stability.³⁰

A snapshot of these measures shows that they were tightened more frequently after the global financial crisis and leading up to the COVID-19 crisis (Figure 2.6, panel 1). Measures related to bank capital and liquidity were tightened most often owing to banking sector regulatory reforms across economies in the aftermath

³⁰See FSB (2020) and Chapter 3 of the April 2015 GFSR on the growth of the nonbank financial intermediation and the asset management sector, respectively, since the global financial crisis. One plausible reason for the increase in nonfinancial corporate sector leverage over the past decade despite a tightening of macroprudential measures, as discussed below, could be the shift from bank-based to nonbank finance.

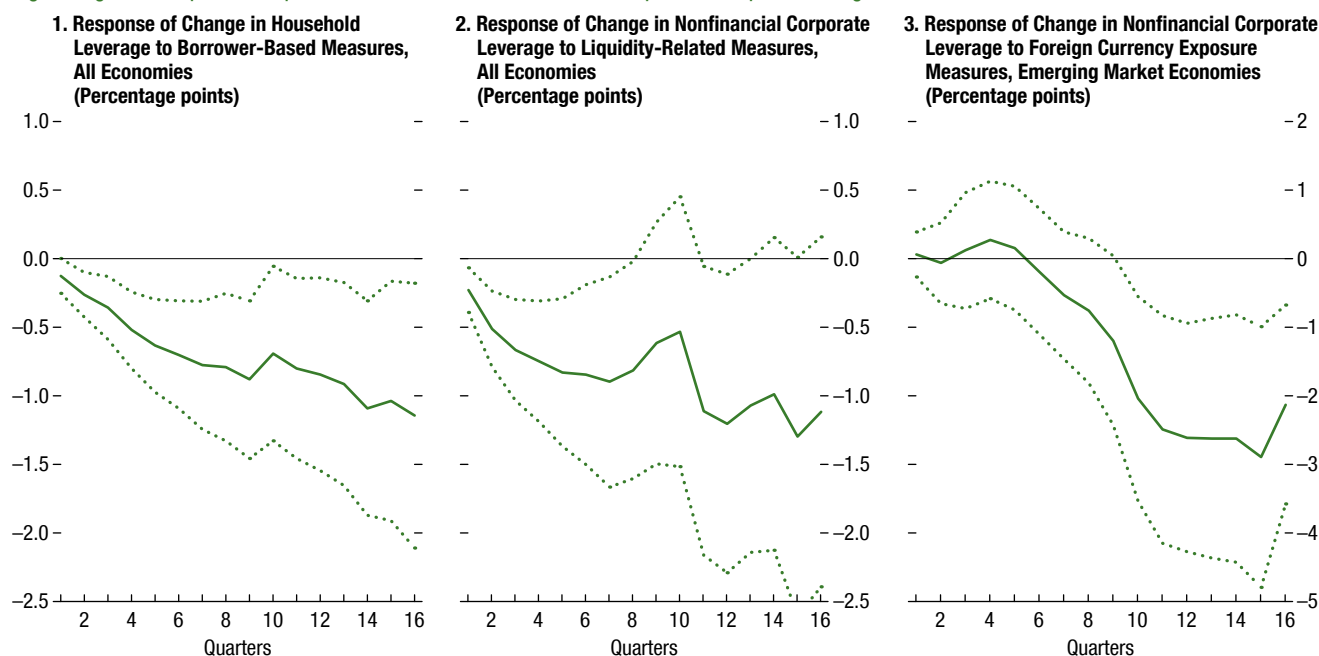
of the global financial crisis. Looking across country groups, it is also apparent that measures related to the foreign currency exposure of banks are more prevalent in emerging markets than in advanced economies (Figure 2.6, panel 2).

Empirical findings confirm that a tightening of macroprudential measures has a measurable impact on leverage buildups. Taking the net number of tightening actions during a quarter and within a category—that is, the difference between the total number of tightening actions and loosening actions, without distinguishing across the specific measures or considering their intensity³¹—the analysis shows that tightening a borrower-based measure (the household LTV or DSTI, for instance) is followed by a

³¹The analysis focuses on the number of tightening episodes, rather than the intensity of applied measures, as the latter is difficult to quantify consistently across different measures and economies.

Figure 2.7. Association between Macroprudential Tightening and Change in Leverage

Tightening of macroprudential policies is associated with slower subsequent buildups of leverage.



Sources: Institute of International Finance; and IMF staff calculations.

Note: The panels show the association between a one-unit net tightening in the respective category of macroprudential measures and the subsequent change in the household or nonfinancial corporate-debt-to-GDP ratios over horizons of 1–16 quarters. The control variables in all regressions include a one-quarter change in the sector-specific debt-to-GDP ratio, GDP growth, Financial Conditions Index, inflation, short-term interest rate (all one-period lagged), and a dummy variable for the global financial crisis. Dashed lines indicate 90 percent confidence intervals. See Online Annex 2.4 for additional details.

reduction in the household debt-to-GDP ratio by up to 1 percentage point over a two-year horizon (Figure 2.7, panel 1).³² Similarly, a net tightening of banks’ liquidity requirements is also associated with a reduction in corporate leverage by up to 1 percentage point of GDP over a two-year horizon (Figure 2.7, panel 2).³³ Notably, for emerging markets, where

both domestic and external borrowing by firms is often denominated in foreign currency, a tightening of foreign-exchange-related measures for banks is significantly associated with lower future nonfinancial corporate leverage. Specifically, a net tightening of such measures is followed by a decline in nonfinancial corporate leverage of about 2½ percentage points over three years (Figure 2.7, panel 3).

Considering all macroprudential measures together to assess their collective impact, a net tightening also appears to be effective in containing downside risks to future growth. That is, a net tightening across all categories of macroprudential policies is associated with a significantly lower downside risk to future growth by about half a percentage point (see Figure 2.8, panel 1, where, again, a higher value is to be interpreted as lower downside risk).³⁴

³²For a given category of measures, net tightening is computed as the difference between the total number of tightening and loosening of measures in a country in a given quarter, and assigned a value of 1 if the difference is positive, 0 if there is no difference, and –1 if the difference is negative.

³³While all six categories of macroprudential policies were tested, Figure 2.7 reports those categories that yielded the most robust estimated responses of leverage growth. In some specifications, capital measures were also associated with slowing leverage buildups for nonfinancial firms, but not for households. Furthermore, conducting these tests using a measure of macroprudential shocks based on estimates from an ordered probit model, as in Brandao-Marques and others (2020), leads to qualitatively similar results. Overall, the findings reported are similar to those reported in earlier literature (Araújo and others 2020). The results regarding measures on foreign currency exposure are in line with Ostry and others (2012) and Cerutti, Claessens, and Laeven (2017), who find that foreign-exchange-related macroprudential regulations (for example,

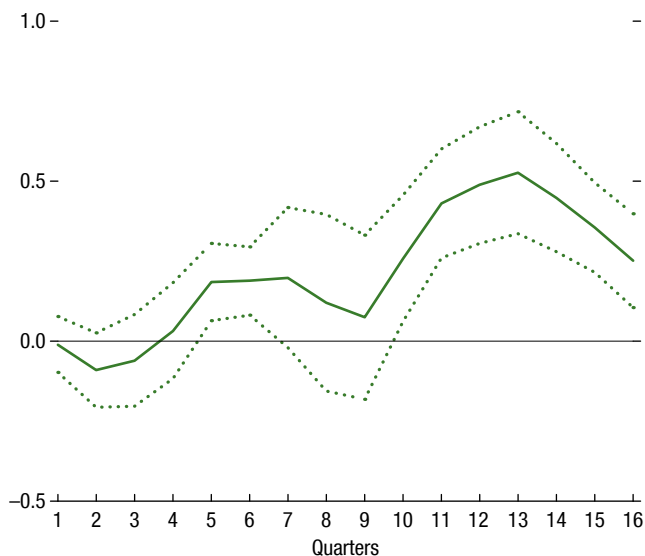
limits on foreign currency lending) reduce nonfinancial sector credit growth in emerging markets.

³⁴Net tightening is defined in a way similar to individual categories, with the difference between the total number of tightening and loosening of measures in a country in a given quarter considered as 1 if the difference is positive, 0 if there is no difference, and –1 if the difference is negative.

Figure 2.8. Macroprudential Measures and Downside Risks to Future Growth

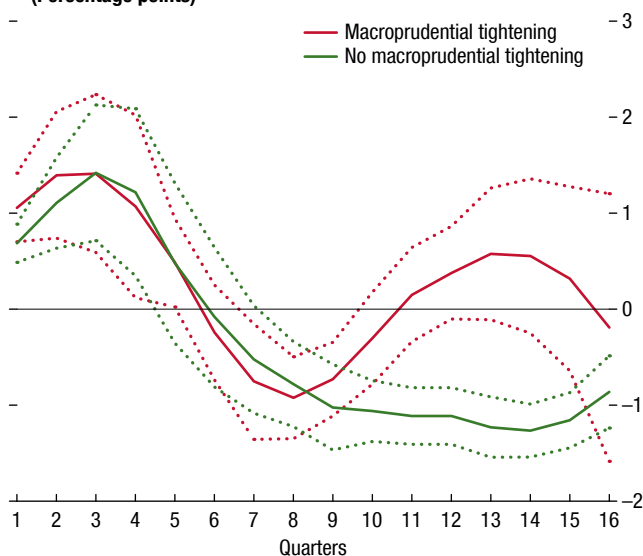
Macroprudential tightening is associated with lower downside risk to future economic activity ...

1. Impact of Macroprudential Tightening on the 10th Percentile of GDP Growth (Percentage points)



... and can mitigate the intertemporal policy trade-off that arises from loose financial conditions.

2. Impact of Loosening Financial Conditions on 10th Percentile of GDP Growth (with Macroprudential Tightening vs. without Macroprudential Tightening) (Percentage points)



Sources: Institute of International Finance; and IMF staff calculations.

Note: Panel 1 shows the effects of a net tightening event across the 17 types of macroprudential measures found in the IMF Integrated Macroprudential Policy database. Panel 2 shows the effect of a one-unit loosening in the Financial Conditions Index. The “macroprudential tightening” regime contains all quarters with net macroprudential tightening in the past year. The dependent variable is the year-over-year growth in real GDP over horizons of 1–16 quarters ahead. The control variables in all regressions are the change in nonfinancial corporate and household leverage over the past eight quarters, year-over-year GDP growth, and the inflation rate. All the responses are estimated with panel fixed-effects quantile local projections at the 10th percentile of the growth distributions. Dashed lines indicate 90 percent confidence intervals.

These findings imply that macroprudential tightening can help offset the increase in medium-term downside risks associated with easing financial conditions. When a loosening of financial conditions coincides with macroprudential tightening, the intertemporal trade-off is almost entirely mitigated (Figure 2.8, panel 2), consistent with the findings of Brandao-Marques and others (2020).

In sum, the analysis shows that macroprudential policies play two important roles regarding financial stability risks. First, the tightening of targeted measures helps to lean against the wind, tempering or even reversing leverage buildups, particularly during credit booms. Second, overall tightening contributes to mitigating the intertemporal trade-off, either reducing downside risk directly or counteracting the risk inherent in loose financial conditions when leverage has been growing rapidly.³⁵

³⁵From a growth-at-risk perspective, the role of macroprudential policy in mitigating downside risks to future growth is consistent with its objective of limiting systemic risk.

Conclusions and Policy Recommendations

In the decade or so following the global financial crisis, leverage increased steadily in the non-financial corporate and household sectors across many economies in the world, largely buoyed by relaxed financial conditions. Global nonfinancial sector leverage reached a historically high level by the end of 2019, just before the onset of the COVID-19 pandemic.

As a result of the pandemic, central banks around the world have pursued highly expansionary monetary policy to ease financial conditions in order to maintain the flow of credit to households and firms and thus support aggregate demand. Liquidity needs by firms and households have been met by additional debt, which has for the time being cushioned the devastating effects of the pandemic crisis.

However, as shown by the analysis in this chapter, rising leverage could increase risks to financial stability

and pose a challenge to policymakers once the post-COVID-19 recovery takes root. Specifically, authorities will likely face a policy trade-off, given that accommodative policy boosts short-term activity but at the cost of a potentially greater downside risk to growth in the medium term as a result of increased nonfinancial sector leverage.

This trade-off can be mitigated by the use of macroprudential tools. Tightening measures targeted at the eligibility of borrowers or at liquidity-related limits on banks are associated with slower buildups in leverage of either households or nonfinancial firms. Measures aimed at curbing foreign currency exposures of banks are effective at reining in buildups of nonfinancial corporate leverage in emerging markets. Tightening macroprudential measures can also improve the intertemporal trade-off, reducing downside risk in the medium term and mitigating the effects of loosening financial conditions.

The analysis in this chapter provides a useful framework for policymakers to assess the policy choices they face in the post-COVID-19 future. As discussed in Chapter 1 and in the April 2021 *Fiscal Monitor*, maintaining adequate policy support to firms and households in the near term is crucial for economies where recovery has not yet taken hold, or remains fragile. Nonetheless, policymakers need to remain vigilant to the risks of high leverage and be well aware of the need to reduce those risks, including through well-designed policies to deal with highly indebted firms, greater supervisory attention to risk taking, and the swift implementation of macroprudential tightening as soon as macroeconomic conditions permit. Furthermore, an increased reliance on macroprudential policy to

mitigate financial stability risks underscores the need to limit potential leakages, which weaken the effectiveness of these tools as finance increasingly migrates away from banks to NBFIs.³⁶ Thus, efforts should be made urgently to further develop the toolkit for non-bank financial intermediaries. Given the challenges to designing and operationalizing macroprudential tools within existing frameworks, policymakers should also consider the need to build buffers elsewhere to protect the financial system.

Adequate timing for deployment of macroprudential tools must be economy-specific, depending critically on the pace of recovery, postcrisis vulnerabilities, and the policy toolkit available to policymakers. Given the expected divergence in the pace of recovery across economies, but also within economies and sectors (see Chapter 1 and the April 2021 *World Economic Outlook*), policy actions will need to be well calibrated and designed according to the specific circumstances facing economies.³⁷ Policymakers should also be mindful of the lags in implementation for the macroprudential measures to take full effect, and thus should take early action to tighten selected tools to address rising vulnerabilities in the nonfinancial sector.³⁸

³⁶Claessens and others (2021) provide cross-country evidence that macroprudential tightening increases NBFIs activities and spills over across borders. A recent example of the application of macroprudential tools to NBFIs is Korea, which extended limits on household lending at high debt service ratios to some NBFIs. In addition, policy measures to contain foreign exchange risks also apply to some NBFIs in Korea (IMF 2020).

³⁷In a few economies where recovery has gained momentum (such as China and New Zealand), macroprudential measures pertaining to the real estate sector have been tightened in recent months.

³⁸Further consideration on how and when to tighten macroprudential tools can draw on principles developed to guide IMF bilateral advice to member countries (IMF 2014).

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