

TRADING PLACES: REAL SPILLOVERS FROM G20 EMERGING MARKETS

After more than two decades of impressive growth—averaging almost 6 percent a year—the emerging markets of the Group of Twenty (G20) now account for about 30 percent of global economic activity and about one quarter of global trade. At the same time, these economies have become increasingly systemic through their integration into global value chains (GVCs), with the potential to move global markets. This implies that spillovers to growth from shocks originating in these economies—as well as from their structural slowdown over the past decade—can have far greater ramifications for global activity. Since 2000, spillovers from domestic shocks in G20 emerging markets—particularly China—have increased and are now comparable in size to those from shocks in advanced economies. Shocks in G20 emerging markets can explain as much as 10 percent of output variation after three years in other emerging markets and 5 percent in advanced economies. Trade, notably through GVCs, is a key propagation channel that has strengthened over time. Firms more dependent on demand from G20 emerging markets experience higher revenue growth after an unexpected increase in G20 emerging market growth, whereas downstream spillovers can reduce firm revenues in countries more exposed to import competition. In response to a negative productivity shock in GVC-intensive sectors in G20 emerging markets, most sectors across emerging market and developing economies tend to contract, especially in Asia, whereas many manufacturing sectors expand, mostly in advanced economies. Looking ahead, simulations suggest that a plausible growth acceleration in G20 emerging markets,

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even excluding China, could support global growth over the medium term and spill over to other countries. The task for policymakers in recipient economies—whether advanced or not—is to maintain sufficient buffers and strengthen policy frameworks to manage the possibility of larger shocks from G20 emerging markets.

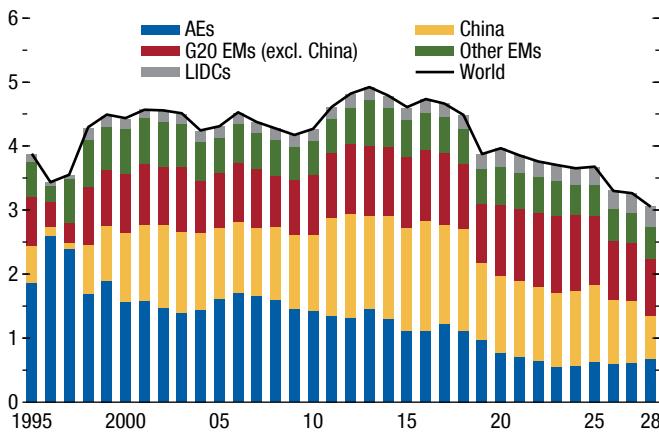
Introduction

Economic growth in the 10 emerging markets of the Group of Twenty (G20) has consistently outperformed that of advanced economies over the past two decades. As their share of world GDP has more than doubled since 2000, Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, and Türkiye (henceforth “G20 EMs”) have continued to integrate into the global economy—notably through trade and global value chains (GVCs). Not only has this helped provide global momentum for growth and trade, it has also been a force for lower output volatility—thanks to cross-country diversification—and convergence in income and living standards (Caselli and others 2020; Patel, Sandefur, and Subramanian 2021).

However, fading growth prospects for G20 EMs have driven more than half of the 1.9 percentage point slowdown in medium-term global growth since the global financial crisis, with China accounting for about 40 percent (see Chapter 1 of the October 2023 *World Economic Outlook* [WEO] and Kose and Ohnsorge 2023). The medium-term growth outlook for G20 EMs has weakened by 0.8 percentage point to 3.7 percent as a result of scars from the pandemic and the price shocks that followed the Russian invasion of Ukraine (Figure 4.1). While Chapter 3 focuses on the drivers of the weak growth outlook, this chapter considers its potential cross-border effects.

With their stronger global presence and greater connectivity, the subdued outlook for G20 EMs risks spilling over and setting back growth and development across other emerging market and

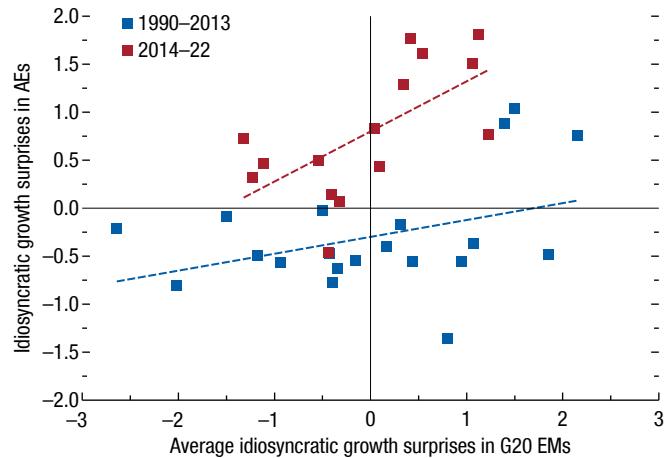
Figure 4.1. Five-Year-Ahead GDP Growth (Percent)



Source: IMF staff calculations.

Note: The predicted variable is real GDP growth. The years on the horizontal axis refer to the year for which a forecast is made, using the April *World Economic Outlook* five years prior, such that, for example, the 2028 forecast is based on the April 2023 *World Economic Outlook*, and so on. AEs = advanced economies; EMs = emerging markets; excl. = excluding; G20 EMs = Argentina, Brazil, China, India, Indonesia, Mexico, Russia, Saudi Arabia, South Africa, and Türkiye; LIDCs = low-income developing countries.

Figure 4.2. Correlation of Idiosyncratic Growth Surprises between Advanced Economies and G20 Emerging Markets (Percent)



Source: IMF staff calculations.

Note: Growth surprises are defined as $GS_{it} = Growth_{it}^{Act} - Growth_{it-1}^{Proj}$ (using the April WEO projections); idiosyncratic growth surprises ($\hat{\gamma}_{it}$) are defined as the residual of this regression: $GS_{it} = \tau_i + \theta_j + \gamma_{it}$, in which τ_i and θ_j are year and country fixed effects, respectively. See Figure 4.1 for a list of G20 EMs. AEs = advanced economies; EMs = emerging markets; WEO = *World Economic Outlook*.

developing economies. Indeed, the likelihood of spillovers has increased as the correlation between domestic (idiosyncratic) growth surprises in advanced economies and those in G20 EMs has strengthened over the past decade (Figure 4.2).¹ Despite important differences across countries, evidence that emerging markets are clear sources of international spillovers is also growing (Cashin, Mohaddes, and Raissi 2017; Arezki and Liu 2020; Huidrom and others 2020).

Therefore, the possibility of large spillovers from G20 EMs to the global economy presents an important set of issues and questions for policymakers over the near and long terms:

- Considering the growing influence of G20 EMs, to what extent can they influence global variables?
- In the short term, how large (and different) are aggregate growth spillovers from G20 EMs and how do they compare with those from advanced economies? Which countries generate the largest spillovers, and are those spillovers global or regional?

- To what extent do domestic shocks originating in G20 EMs propagate through trade and supply chains and reallocate activity across countries, sectors, and firms over the longer term? And has this channel strengthened in recent years?

The chapter proceeds in four parts. It starts with an overview of the growing global footprint of G20 EMs—building on the results of Chapter 3 of the 2014 *Spillover Report*—highlighting G20 EMs’ greater global significance for commodities, investment, financial flows, and trade (IMF 2014). These are also the key channels through which shocks from G20 EMs can propagate to the real economy.² In the second part, the chapter provides an empirical assessment of aggregate growth spillovers from demand and supply shocks in individual G20 EMs in the near term.

Third, based on the finding that financial integration has been relatively slower than that for trade and commodities, the chapter examines spillovers from

¹Domestic (idiosyncratic) growth surprises are defined as the residual from GDP growth outturns after the previous year’s forecasts are subtracted and after global factors are controlled for.

²While shocks from G20 EMs could also drive prices and inflation, the chapter focuses on spillovers to real economic activity.

G20 EMs through the latter channels—taking into account GVCs—over the medium and longer terms:³

- Firm-level data are used to estimate the effect of domestic growth surprises in G20 EMs on firm turnover in trading partners over the near to medium term. The analysis investigates separately the transmission of shocks conditional on the intensity of a firm's dependence on demand from G20 EMs for their products (*output linkages*) and its use of intermediate inputs from G20 EMs (*input linkages*).
- The longer-term pattern and evolution of spillovers from productivity shocks in G20 EMs is then explored using a multicountry, multisector model that allows for tracking of the reallocation of production across sectors and countries in various steady-state scenarios. Each scenario is designed to trace the impact of shocks originating in specific sectors across countries, such as those heavily integrated into GVCs, and within countries, such as construction in China, to help our understanding of longer-term cross-border spillovers.

Fourth, motivated by weak growth prospects in China, a model-based simulation is used to assess whether positive growth surprises in other G20 EMs—and the associated spillovers—can help support global growth.

The main conclusions of the chapter are as follows:

- G20 EMs have indeed become more important for global economic activity. Their global trade and investment footprint has almost doubled since the early 2000s, while global financial integration continues to increase. G20 EM consumers and firms make up a growing share of global demand, and firms in G20 EMs (for example, China, India, and Russia) supply a larger share of total inputs globally.

³The 2014 *Spillover Report* includes a detailed discussion of the trade, commodities, and financial channels in the context of emerging markets and shows that, although spillovers transmit mostly through trade linkages, they can also have sizable effects through financial linkages, including those through banks. Chapter 2 of the April 2016 *Global Financial Stability Report* documents (1) how the rise in financial market integration of emerging markets has strengthened international spillovers and (2) the growing importance of financial factors relative to trade linkages. More recently, Arezki and Liu (2020) confirm the importance of financial linkages for spillovers from emerging markets. Other channels, such as migration, can also make a difference. For example, the emigration of high-skilled labor from G20 EMs can have implications for labor supply, productivity, and innovation in recipient countries (Bosetti, Cattaneo, and Verdolini 2015; World Bank 2018; Bahar, Choudhury, and Rapoport 2020).

In addition, these economies are among the largest producers of key commodities, including those critical for the green transition (for example, Argentina for lithium and Indonesia for nickel). While China continues to drive many of these patterns, other G20 EMs play an important role.

- Deeper integration means that G20 EMs increasingly resemble advanced economies and are no longer simply on the receiving end of global shocks. Their output fluctuations have become less volatile, driven to a greater extent by domestic shocks, and—in the case of some countries—can also influence global prices. Their growth spillovers not only have increased but can also explain almost 5 percent of GDP variation in advanced economies. Furthermore, growth spillovers from some G20 EMs have reached magnitudes similar to those from advanced economies. Spillovers are largest from China, whose domestic shocks can explain about 10 percent of the variation in GDP in other emerging markets. Other G20 EMs have significant regional spillovers. Examples are those from Russia, in both the Middle East and Europe, and from Mexico in Latin America.
- Domestic growth shocks from G20 EMs propagate through GVCs and can generate winners and losers through sectoral reallocation. Following a positive shock, firms with greater dependence on demand from G20 EMs (for example, China and India), especially if located in emerging markets, tend to experience faster revenue growth than other firms. However, spillovers tend to be negative for firms that rely more on inputs supplied by G20 EMs. This suggests that positive growth surprises in G20 EMs such as China and Mexico could be associated with an expansion of competing production, which could displace existing activity in trading partners.
- Over the long term, negative productivity shocks in G20 EMs tend to give rise to negative global spillovers through the trade channel but can also generate some positive spillovers for some sectors and economies. And these spillovers have increased almost threefold since the early 2000s. In a scenario in which all G20 EMs experience a productivity growth slowdown, Asia is the hardest-hit region, with the intensity driven by its strong links to China. A scenario in which productivity shocks are concentrated in GVC-intensive sectors highlights substantial variation in spillovers across sectors: while most shrink—particularly those in Asia—many manufacturing sectors (for example, electronics and textiles)

expand as economies take advantage of the decrease in supply from G20 EMs. In terms of employment, a positive shock from G20 EMs can lead to job losses for some sectors through increased competition, whereas spillovers that propagate through sectors connected through GVCs tend to generate complementarities and more job opportunities. Comparison of shock transmission before and after 2000 shows that spillovers have grown, underlining the increased importance of G20 EMs as a result of GVC integration.

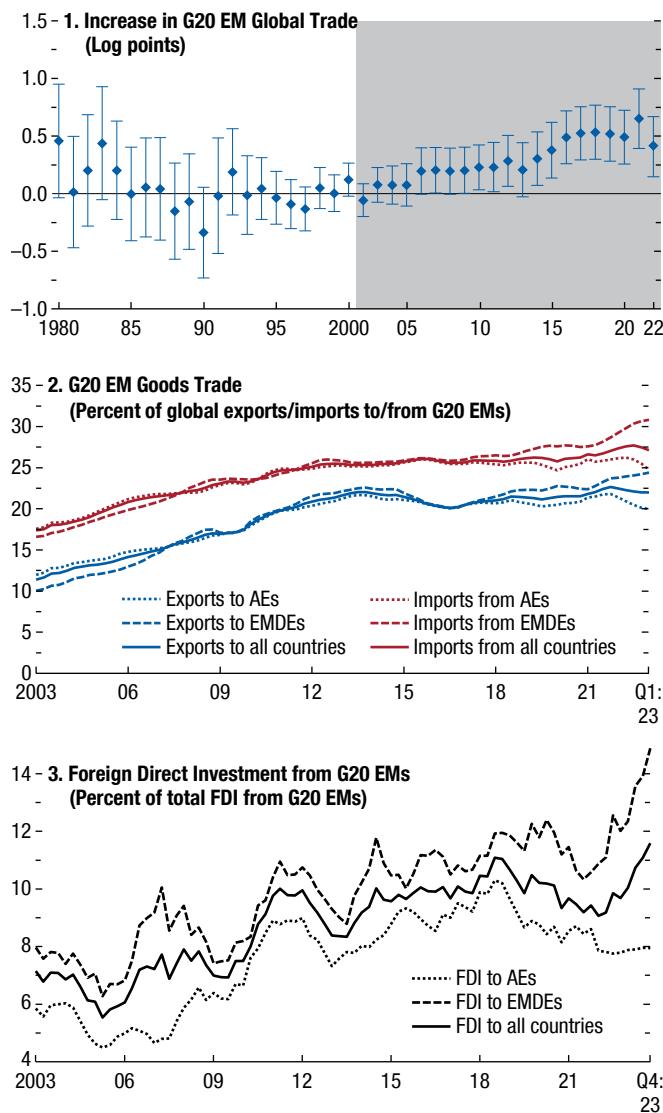
- Looking forward, a plausible growth acceleration in individual G20 EMs (excluding China) could generate spillovers to advanced economies and other emerging market and developing economies, which would support global growth.

What is clear is that G20 EMs as a group—beyond China alone—have emerged as an important source of global and regional spillovers, which are only set to grow as these economies continue to integrate further into finance and trade. For this reason, policymakers must remain cognizant of the impact a slowdown in these economies could have on firms and sectors within their borders. As a result, countries with strong linkages to these economies should build appropriate buffers and policy frameworks to insure against the transmission of negative shocks and potential external risks. Given the degree of reallocation in activity across sectors in response to G20 EM shocks—notably in countries that are more heavily integrated through trade and GVCs—policymakers should consider diversifying output and input linkages and pursue domestic structural policies to avoid large-scale dislocation of production factors and promote efficient reallocation of those factors. They should also refrain from adopting protectionist policies that are detrimental to the domestic economy and can generate negative cross-border spillovers (Box 4.1).

G20 Emerging Markets in the Global Economy

China's accession to the World Trade Organization in December 2001 represents a critical turning point for G20 EM integration into the global economy. Since then, the G20 EM share of global trade has increased almost two-thirds faster than that of trade among other countries (Figure 4.3, panel 1),

Figure 4.3. The Growing Footprint of G20 Emerging Markets in Trade and Investment



Sources: fDi Markets; IMF, *Direction of Trade Statistics*; and IMF staff calculations. Note: Panel 1 is based on a standard gravity trade model in which the dependent variable is the log of bilateral goods trade. The model includes country pair, source \times year, and destination \times year fixed effects. The chart plots the yearly coefficient of a dummy for the bilateral pairs involving G20 EMs (the reference year is 2001). Panel 3 uses the count of FDI projects. See Figure 4.1 for a list of G20 EMs. AEs = advanced economies; EMs = emerging markets; EMDEs = emerging market and developing economies; FDI = foreign direct investment.

promoting global trade and country-wide diversification. In addition, in the two decades since accession, the share of G20 EM goods imports and exports in total goods trade has doubled (Figure 4.3, panel 2), whereas foreign direct investment (FDI) from G20 EMs increased from about 6 percent of total FDI in

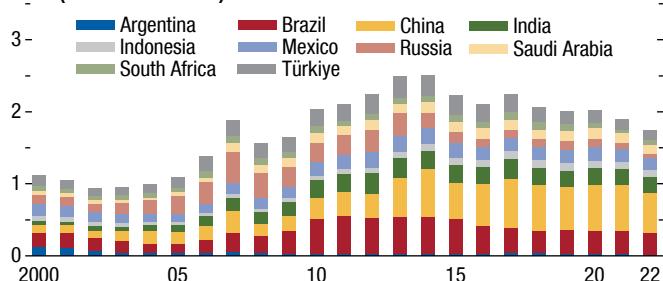
2005 to about 10 percent just before the pandemic (Figure 4.3, panel 3).⁴

Since 2018, the shares of trade and investment flows to advanced economies and to other emerging market and developing economies have diverged. Whereas flows to advanced economies have declined relative to the global average, flows to emerging market and developing economies have accelerated, which in part reflects stronger investment ties fostered through the Belt and Road Initiative (Baniya, Rocha, and Ruta 2020; De Soyres, Mulabdic, and Ruta 2020). This divergence has also coincided with the beginning of US-China trade tensions and has been reinforced by increasing geopolitical tensions (see Chapter 4 of the April 2023 WEO) as the largest economies have realigned trade and investment linkages through “friend-shoring” and near-shoring (Alfaro and Chor 2023; Freund and others 2023; Gopinath and others 2024).

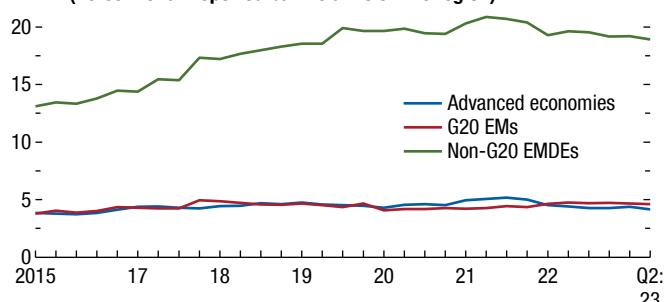
Stronger participation in global trade is mirrored in increasing financial integration via bank flows and, to a lesser extent, portfolio flows, even though the overall scale remains smaller than that of trade. Lending from banks in the Group of Five (G5) major industrial economies (France, Germany, Japan, United Kingdom, United States) to G20 EMs has nearly doubled since the early 2000s, peaking at more than 2.5 percent of G5 economies’ GDP in 2014 and then gradually declining. Lending to China has driven the increase, followed by that to Brazil and India (Figure 4.4, panel 1). For comparison, goods trade with G20 EMs accounted for 8.1 percent of the total GDP of the G5 economies in 2022. These financial flows are consistent with the more general observation that *private* capital has been flowing downstream to economies with stronger growth performance, as originally shown by Gourinchas and Jeanne (2013) and Alfaro, Kalemli-Özcan, and Volosovych (2014) (Box 4.2). On the flip side, G20-EM-headquartered banks’ cross-border lending to advanced economies is relatively limited. For other emerging market and developing economies, however, it accounts for about 20 percent of total cross-border bank claims in line with recent evidence on the rise of Chinese banks (Cerutti, Casanova, and Pradhan 2023) and the increase of South-to-South flows shown by Broner and others (2023) (Figure 4.4, panel 2). Portfolio flows show that G20 EMs’ liabilities

Figure 4.4. G20 Emerging Market Financial Integration

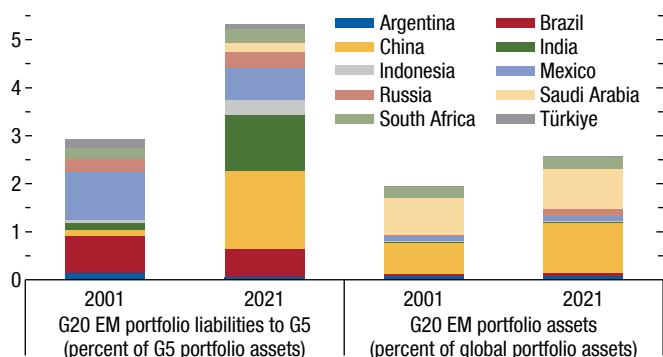
**4 - 1. Cross-Border Bank Lending to G20 EMs from G5 Economies
(Percent of G5 GDP)**



**25 - 2. Cross-Border Bank Lending from Reporting G20 EM Banks
(Percent of all reported bank claims on the region)**



6 - 3. G20 EM Portfolio Assets and Liabilities



Sources: Bank for International Settlements, locational banking statistics by nationality; Bank for International Settlements, locational banking statistics by residence; IMF, Coordinated Portfolio Investment Survey; Lane and Milesi-Ferretti 2018; and IMF staff calculations.

Note: G5 = France, Germany, Japan, United Kingdom, United States. EMs = emerging markets; EMDEs = emerging market and developing economies.

to the G5 economies increased between 2001 and 2021, from 2.9 percent to 5.3 percent of the sender countries’ total portfolio claims—equivalent to 4.6 percent of G5 GDP in 2021—with particularly large exposure to China, followed by India, Mexico, and Brazil (Figure 4.4, panel 3, left bars). A similar result is obtained when zooming in on the US cross-border securities portfolio as a case study. This, however, is likely to be a lower bar,

⁴More details on the stylized facts, measurement, and data sources are discussed in Online Annex 4.1. All online annexes are available at www.imf.org/en/Publications/WEO.

because portfolio flows from advanced economies to emerging markets—most notably China—are larger once flows through low-tax jurisdictions are included (Bertaut, Bressler, and Cururu 2019; Bergant, Milesi-Ferretti, and Schmitz 2023; Coppola and others 2021). On the asset side, however, G20 EM portfolio flows to the rest of the world are still limited, although on the rise, at just over 2.5 percent of total cross-border portfolio assets as of 2021 (Figure 4.4, panel 3, right bars).

G20 EMs are global producers of a broad set of commodities (Figure 4.5, panel 1). Beyond China and its continued sizable commodity outputs, Russia and Saudi Arabia are important oil and energy suppliers, and Brazil is a noteworthy producer of agricultural commodities and minerals. But G20 EMs have also played a key role in commodity demand since the 2000s, when rapid growth led to an increase in the global consumption of energy, food, and metals (Baffes and others 2018; Fernández, Schmitt-Grohé, and Uribe 2023). At the same time, G20 EMs have become producers of minerals that are critical for the green transition—notably, lithium in Argentina and nickel in Indonesia. As demand for these commodities is set to rise, G20 EMs are likely to become ever more integrated into supply chains and drive greater commodity price volatility in a fragmented world (see Chapter 3 of the October 2023 WEO).⁵

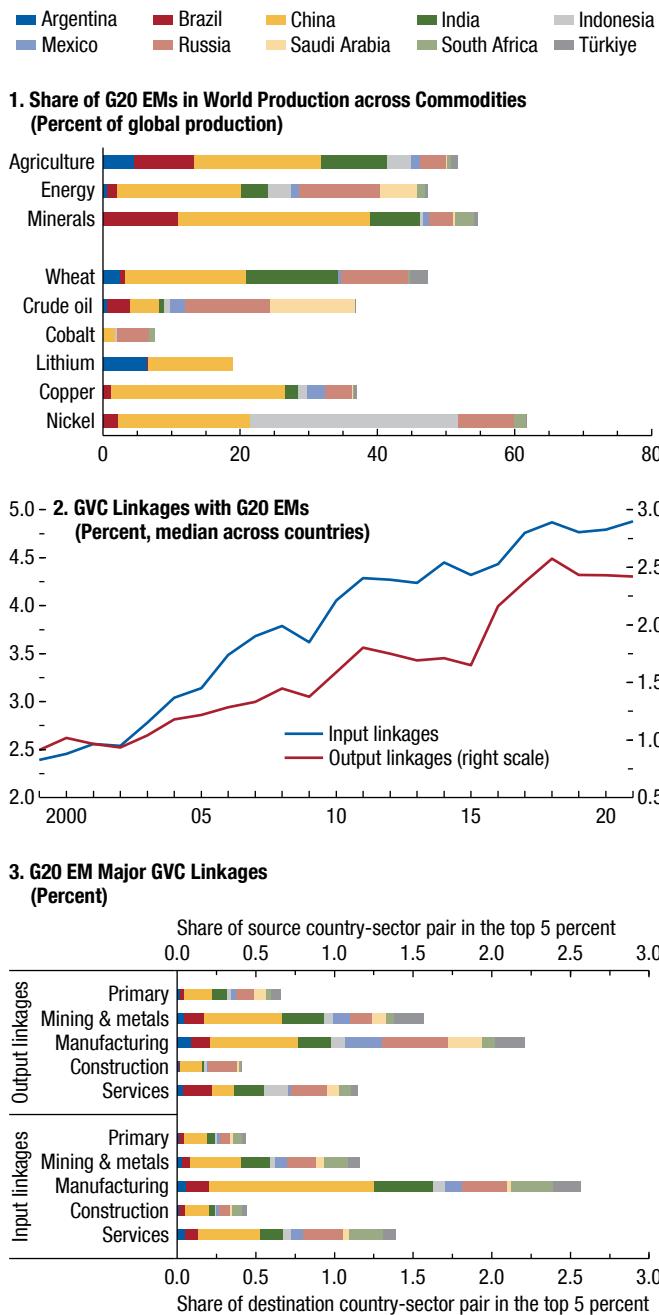
G20 EMs have also expanded their participation in GVCs both downstream and upstream as a result of their demand for manufacturing products (*output linkages*) and their supply of inputs to other economies (*input linkages*). The median country doubled its inputs from G20 EMs between 2000 and 2021, while demand from G20 EMs for outputs more than doubled (Figure 4.5, panel 2).⁶ Increased trade and GVC integration among G20 EMs results from unbundling related to declining transportation, information, and communication costs, technological progress, and lower barriers to trade and capital flows, which have allowed emerging markets to become more vertically integrated in global supply chains (Baldwin 2013; Amador and Cabral 2016).

Two sectors—manufacturing and mining—dominate

⁵The larger role of G20 EMs in driving commodity price volatility has recently been identified using high-frequency data. Gutierrez, Turen, and Vicondoa (2024) study the international spillover effects of a macroeconomic surprise in China, identifying a sizable and significant dynamic effect on commodity prices.

⁶Output linkages are defined as the share of global demand from G20 EM consumers and firms, while input linkages are defined as the share of total inputs supplied by G20 EM industries. An important caveat is that these measures capture only *direct* exposures to G20 EMs. See Online Annex 4.1.

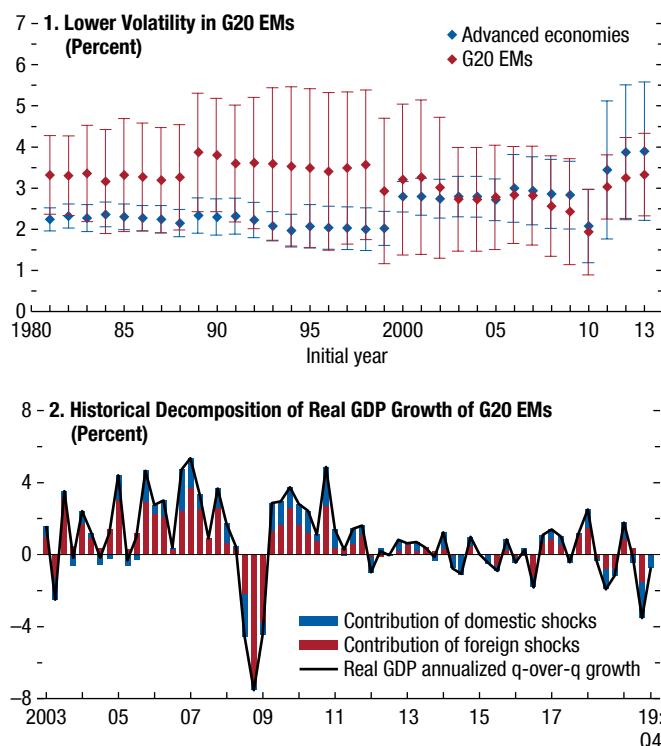
Figure 4.5. G20 Emerging Market Presence in Global Value Chains and Commodities Can Amplify Spillovers



Sources: British Geological Survey; Eora Global Supply Chain Database; Food and Agriculture Organization of the United Nations; International Energy Agency; US Geological Survey; and IMF staff calculations.

Note: In panel 2 output linkages are defined as the share of global demand from G20 EM consumers and firms, while input linkages are defined as the share of total inputs supplied by G20 EM industries. Output and input linkages are computed at the country-year level. In panel 3 output and input linkages are computed at the source country-sector and destination country-sector pairs, respectively, over the period 1999–2021. The chart plots the distribution of the top 5 percent of these linkages across sectors and countries. EMs = emerging markets; GVC = global value chain.

Figure 4.6. Growth in G20 Emerging Markets Is Becoming Less Volatile and Less Driven by Foreign Shocks



Sources: Penn World Table (version 10.1); and IMF staff calculations.

Note: In panel 1, real GDP growth volatility is computed as the within-country standard deviation of real GDP growth over a rolling 10-year window, starting in the year indicated on the x-axis. For instance, the value for 2000 refers to the volatility computed over the period 2000–09. The chart plots the averages of the real GDP growth volatility for advanced economies and G20 EMs. In panel 2, the contributions of domestic shocks are derived as weighted averages of the sum of contributions of domestic aggregate demand and supply shocks estimated for each G20 EM country in country-specific structural vector autoregressions. The contributions of foreign shocks are derived as residuals. See Figure 4.1 for a list of G20 EMs. EMs = emerging markets; q-over-q = quarter over quarter.

the top 5 percent of linkages, alongside China, whose manufacturing production is the largest globally and still highly dependent on external demand (Baldwin 2024) (Figure 4.5, panel 3). Other countries—such as India and Russia—also have a significant presence, reflecting fast growth in manufacturing production (India) and strong linkages through the supply of energy commodities (Russia).

How Have G20 EMs Changed?

As G20 EMs have become more diversified and integrated into the global economy and strengthened their policy frameworks, their macroeconomic fluctuations and vulnerabilities to external shocks have also changed (see Kose and Prasad 2010 for a discussion up to the global financial crisis). First, GDP growth across G20

EMs has become less volatile and is converging to levels in advanced economies (Figure 4.6, panel 1). Second, the contribution of external shocks to G20 EM GDP growth has declined over the past two decades—from about one-half in the years up to the global financial crisis to about one-third after (Figure 4.6, panel 2).

However, the key question is the extent to which domestic shocks in G20 EMs can propagate globally, which is a phenomenon uncharacteristic of small open economies. Building on the framework of Fernández, Schmitt-Grohé, and Uribe (2017), this chapter subjects G20 economies to a “*small open economy test*” to determine whether domestic fluctuations can influence global variables—the real prices of agricultural, energy, and metals commodities, as well as a global financial variable (either the US short-term interest rate, the US 10-year real rate, the broad dollar, or US investment-grade corporate spreads). Cyclical movements in all G20 EMs have become more relevant over time and appear to have influenced at least one global variable since the global financial crisis. However, only domestic shocks in China appear to affect all global variables (Corneli, Ferriani, and Gazzani 2023).

Aggregate Spillovers in the Short Term

If some G20 EMs can be viewed as large economies, then their aggregate demand and supply shocks are likely to have sizable effects at home and abroad (see Chapter 4 of the April 2014 WEO). To get a sense of their importance for other economies, a set of structural and global vector autoregression (VAR) models estimated between 2001 and 2023 are used to quantify aggregate global and regional spillovers over a three-year horizon. In line with the literature, results suggest that aggregate growth spillovers from domestic shocks originating in China to other emerging markets and advanced economies are significantly larger than those coming from other G20 EMs—and that they have increased. A 1 percentage point demand (supply) shock in China leads to an increase of about 0.3 (0.15) percentage point in growth after three years in other emerging markets, with smaller effects in advanced economies.⁷ However, shocks in other G20 EMs can propagate to other G20 economies just as

⁷Additional results are discussed in Online Annex 4.2. The size of these spillovers and their more limited importance for advanced economies are within the range estimated in the literature (Cesa-Bianchi and others 2012; Dizioli and others 2016; Cashin, Mohaddes, and Raissi 2017; Furceri, Tovar Jalles, and Zdzienicka 2017; Huidrom and others 2020; Ahmed and others 2022; Copeland and others 2023).

they do to advanced economies, and can have sizable regional spillovers.

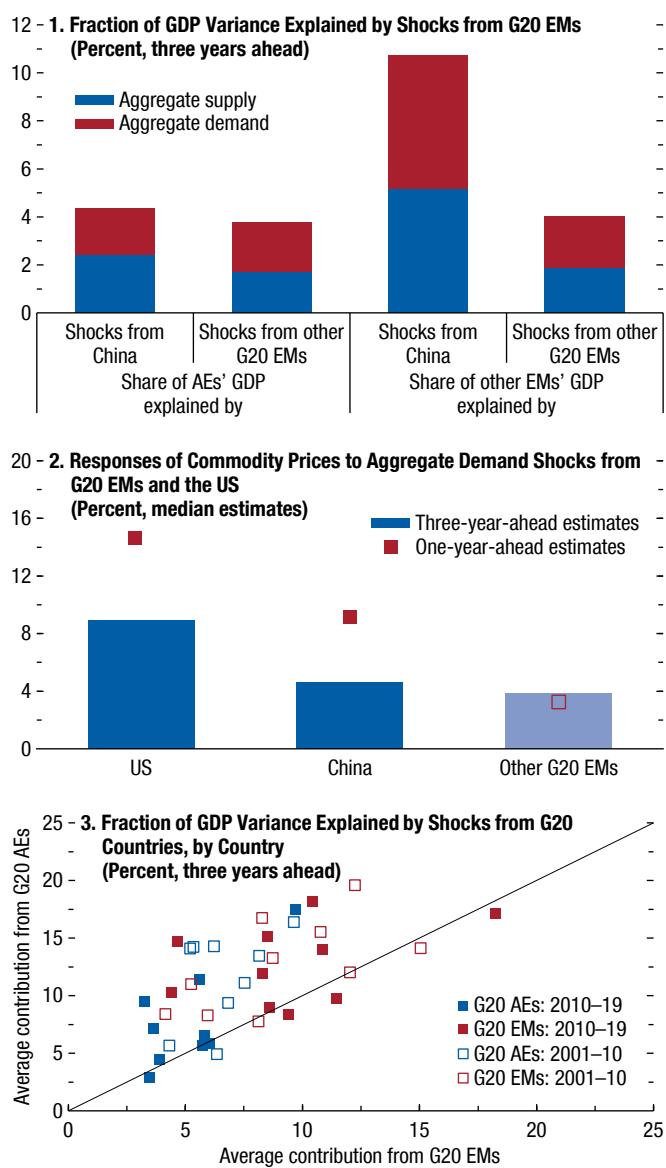
Spillovers from China have increased sharply since 2000. Domestic growth shocks in China explain just under 5 percent of output variation in advanced economies after three years and just over 10 percent of that in other emerging markets. In relative terms, growth spillovers from China to emerging markets are broadly similar in size to those from the United States. By contrast, demand and supply shocks originating in other G20 EMs account for less than 4 percent of GDP fluctuations in other countries (Figure 4.7, panel 1), and their spillovers have grown only moderately (for example, Brazil, India, and Mexico) or even declined (Russia). Similar results hold for spillovers to commodity prices: a 1 percentage point increase in GDP in China leads to commodity prices that are almost 10 percent higher after one year and about 5 percent higher after three years (effects that are not much smaller than those stemming from US demand shocks), whereas demand shocks in other G20 EMs do not significantly move commodity prices (Figure 4.7, panel 2).

Given their relative size, China's aggregate demand shocks were the major driver of spillovers from G20 EMs until the mid-2010s (Copestake and others 2023). These shocks could reflect a mix of policy shocks—such as aggregate demand management, mostly through public investment—or increased demand for imports of raw materials in response to the country's property boom. China's aggregate supply shocks, on the other hand, have been associated with the expansion of productive capacity, increased export orientation, and movement up the value chain after accession to the World Trade Organization (Mano 2016)—and more recently with slowing productivity and a shrinking labor force.⁸

Other G20 EMs can also play an important role in propagating aggregate domestic shocks, both at the global level—in comparison with other advanced economies—and regionally, relative to China. Within the sample of G20 economies, the relative contribution of G20 EMs in explaining output fluctuations increased between the 2000s and the 2010s more than that of G20 advanced economies, such that for an increasing

⁸Estimates of the contributions of aggregate supply and demand shocks from G20 EMs to consumer prices confirm the larger role of China. A negative demand shock equal to 1 percentage point of GDP reduces inflation by about 0.2 percentage point in emerging markets and 0.15 percentage point in advanced economies. Box 1.2 illustrates disinflation pressures from a scenario of a prolonged weakness in the Chinese property sector.

Figure 4.7. Aggregate Spillovers from G20 Countries



Source: IMF staff calculations.

Note: Panel 1 shows weighted averages of median estimates. Fraction of three-year-ahead variance of GDP explained by domestic aggregate demand and aggregate supply shocks in each G20 EM (considering China separately and taking the average of the other G20 EMs) on recipient economies' output. Panel 2 shows one-year- and three-year-ahead impulse responses of commodity prices to aggregate demand shocks originating in China, the US, and other G20 EMs (weighted average). Estimates for the latter are not statistically different from zero. In panel 3, blue (red) squares are averages of fractions of three-year-ahead variance in GDP of G20 AEs (G20 EMs) explained by shocks (sum of aggregate demand and supply shocks) originating in G20 countries (excluding shocks from the US and China) (median estimates). See Figure 4.1 for a list of G20 EMs. AEs = advanced economies; EMs = emerging markets.

number of countries the spillovers from G20 advanced economies and emerging markets (excluding China and the United States) are now broadly comparable (Figure 4.7, panel 3). Although most countries are still predominantly exposed to shocks in advanced economies, some experience more similar exposures, and others are more affected by shocks in G20 EMs.

Moving to regional spillovers, those from China generally dominate those from other emerging markets—especially in Asia—given high intraregional trade integration—and to a lesser extent in Latin America (Figure 4.8).⁹ Of the other G20 EMs, Russia and, to some extent, Türkiye generate significant regional spillovers in Europe and central Asia; domestic supply-side shocks in Brazil and Mexico have an impact on Latin America via strong trade and commodity linkages. Regional spillovers from Russia have manifested themselves clearly since the invasion of Ukraine, through disruptions in energy prices (Bachmann and others 2022; Albrizio and others 2022) and grain markets globally. However, the Russian economy's turn more toward Asia will likely shift the direction of spillovers. Shocks in large emerging markets—and particularly those in China—have sizable cross-border implications for economies in sub-Saharan Africa (Box 4.3) and, more generally, for low-income countries, which are exposed to emerging markets' foreign shocks through the commodity and demand channels (Dabla-Norris, Espinoza, and Jahan 2015).

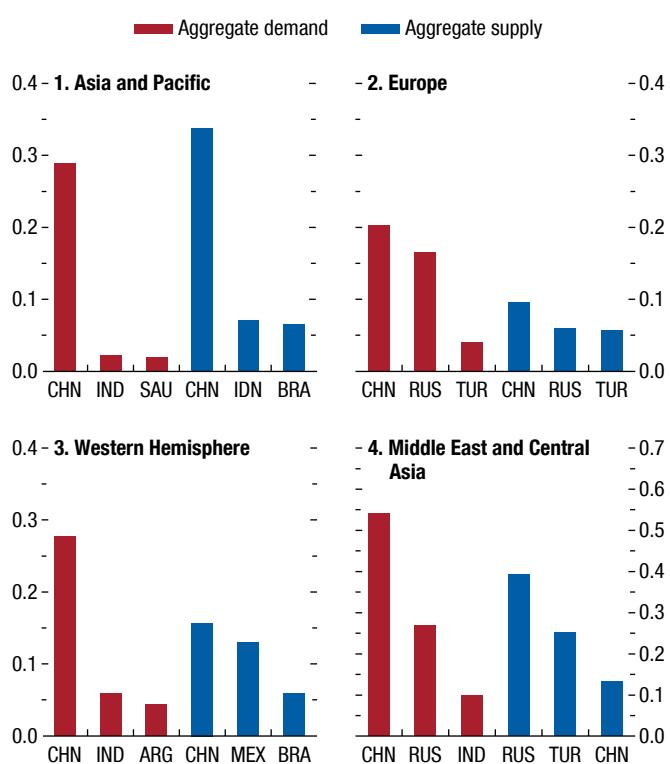
Spillovers from Trade and Global Value Chains

In this section, two complementary approaches are used to move beyond aggregate spillovers to the transmission of shocks from G20 EM through the trade channel—including GVCs—and the reallocation of activity across sectors and firms. The first uses firm-level data and input-output tables to assess how growth surprises in G20 EMs affect firm revenues over the medium term, depending on how firms' input and output linkages with G20 EMs vary across sectors. The second uses a quantitative trade model with input-output data to investigate spillovers from sectoral total factor productivity (TFP) shocks under different long-term steady-state scenarios. These sectoral shocks

⁹See, among others, Cesa-Bianchi and others (2012); Dizioli and others (2016); Furceri, Tovar Jalles, and Zdzienicka (2017); Beirne, Renzhi, and Volz (2023); and the October 2019 *Regional Economic Outlook: Western Hemisphere*.

Figure 4.8. Growth Spillovers from G20 Emerging Markets by Region

(Percent, three years ahead)



Source: IMF staff calculations.

Note: The charts show three-year-ahead cumulative impulse responses to 1 percentage point positive domestic aggregate demand and supply shocks in each G20 EM on recipient economies' output. Each panel reports the top three countries in terms of the size of their spillovers to the region. Reported results are cross-country aggregates using purchasing-power-parity GDP weights of impulse responses that are significant on the basis of 68 percent credible intervals. Data labels in the figure use International Organization for Standardization (ISO) country codes. See Figure 4.1 for a list of G20 EMs. EMs = emerging markets.

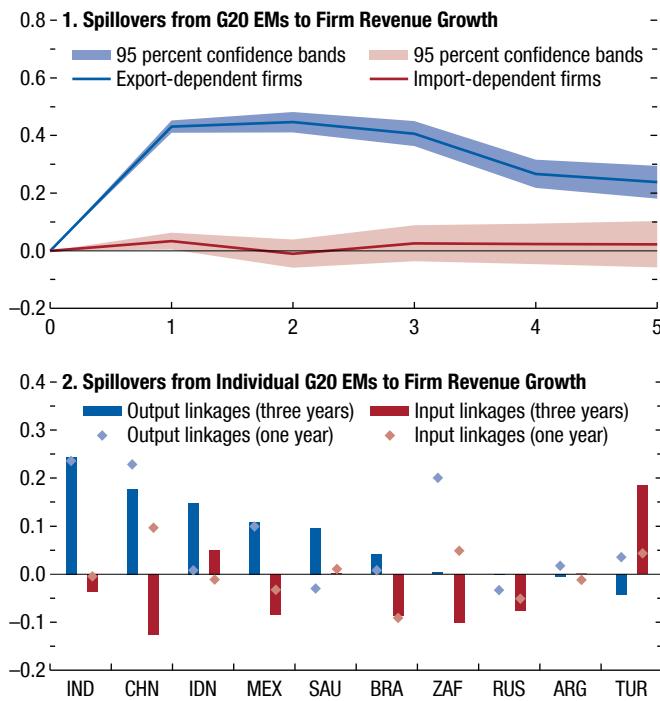
can propagate through supply chains and significantly contribute to global economic fluctuations (Boeckelmann, Imbs, and Pauwels 2024).

Global Spillovers at the Firm Level

At the firm level, domestic growth surprises in G20 EMs have a large and positive impact on firm revenues in sectors more exposed to demand from G20 EMs, notably in other emerging markets.¹⁰ A 1 percentage

¹⁰This firm-level analysis estimates, using local projection methods, the differential effect of growth surprises on firm revenue growth in sectors that are more or less exposed to G20 EMs through direct output and input linkages. See Online Annex 4.3 for a full discussion of the specification, data, and robustness tests.

**Figure 4.9. Firm-Level Spillovers
(Percentage points)**



Sources: Eora Global Supply Chain Database; Orbis; and IMF staff calculations.
Note: Panel 1 plots the impulse responses of firm revenue growth to a domestic growth surprise in G20 EMs for firms more exposed to output (in blue) or input (in red) linkages, compared with similar, less-exposed firms. Panel 2 reports the same results at one- (diamonds) and three- (bars) year horizons considering domestic growth surprises in individual G20 EMs. Solid bars and diamonds indicate significance at the 90 percent level. Data labels in the figure use International Organization for Standardization (ISO) country codes. See Figure 4.1 for a list of G20 EMs. EMs = emerging markets.

point unexpected increase in GDP growth in G20 EMs leads to almost half a percentage point higher revenue growth after one year for these firms, an effect that fades but remains one-half of the initial level even after five years (Figure 4.9, panel 1). This effect is about half the size of similar spillovers from an unanticipated increase in growth in G20 advanced economies.

This finding holds both for firms headquartered in advanced economies and for those headquartered in other emerging markets. However, the impact is higher for firms in the latter—revenue growth is 0.8 percentage point higher after five years for firms with greater exposure. Spillovers also increase over time as the reliance of firms on demand from G20 EMs increases (Figure 4.5, panel 2). These results are consistent with a body of evidence suggesting that increasing demand from China for goods and commodities boosts firm exports in several regions—see, for instance, Feenstra, Ma, and Xu (2019) for the United States and Costa,

Garred, and Pessoa (2016) for Brazil. More generally, positive spillovers from almost all G20 EMs are large for firms in export-dependent industries, both on impact and after three years (Figure 4.9, panel 2).

Turning to downstream spillovers, firms in sectors dependent on intermediate goods produced in G20 EMs seem overall to be unaffected by domestic growth surprises in G20 EMs. This finding could be explained by two opposing transmission channels canceling each other out. On one hand, firms sourcing intermediate inputs from G20 EMs could benefit from cheaper supplies. On the other hand, the same firms may suffer a loss of sales from increased competition should firms in the G20 EMs expand downstream into new products. These negative downstream spillovers could take time to build and are consistent with import competition effects from lower-wage countries (Bernard, Jensen, and Schott 2006), a mechanism popularized by Autor, Dorn, and Hanson (2013) in the context of China and the United States.

While these two channels cannot be identified separately, findings suggest that for shocks originating in Indonesia and Türkiye, the cheaper supply channel may dominate (Figure 4.9, panel 2). For shocks originating in the largest G20 EMs (China, India, Mexico), the competition channel seems to dominate, as spillovers turn negative for firms more dependent on inputs from these EMs, with revenue growth slowing by about 0.1 percentage point more than for firms in less exposed sectors. In the case of specific spillovers from China, the Belt and Road Initiative generated positive effects for more upstream industries through higher import demand in China, but it also increased competition from China in export markets, generating negative spillovers to downstream sectors—those producing goods close to final demand—especially in countries geographically closer to China (Bastos 2020).

Tracking the Reallocation of Global Activity at the Sectoral Level

Moving to the longer term, a multicountry, multisector input-output network model of global trade is used to assess how sectoral productivity shocks in G20 EMs can lead to significant changes in activity across sectors under different scenarios, as well as across economies, depending on their region and level of income (Huo, Levchenko, and Pandalai-Nayar, forthcoming; Bonadio and others 2021, 2023). In the baseline, a negative shock corresponding to 2.5 percent of TFP hits all sectors in all G20 EMs—corresponding to a domestic

output decline of about 10 percent. In a second scenario, only sectors in G20 EMs that are integrated into GVCs are hit by the same TFP shock. Finally, a third scenario presents a case study in which only one sector in one G20 EM is shocked—specifically, the construction sector in China.¹¹

In the baseline scenario, global GDP excluding G20 EMs declines by about 0.15 percent, of which about one-half is attributable to China, followed at a distance by India, Russia, and Mexico (Figure 4.10, panel 1, leftmost bar). This is consistent with China's role as a manufacturing powerhouse and the advanced economies' dependence on Chinese manufacturing production (see Baldwin, Freeman, and Theodorakopoulos 2023 on the “hidden exposure” of the United States to Chinese suppliers), which can make decoupling from China particularly costly (Felbermayr, Mahlkow, and Sandkamp 2023). To help benchmark these G20 EM trade spillovers, the same shocks applied to US productivity yield a global impact excluding the United States about one-third of this magnitude, slightly smaller than the impact from the shock to China alone.¹²

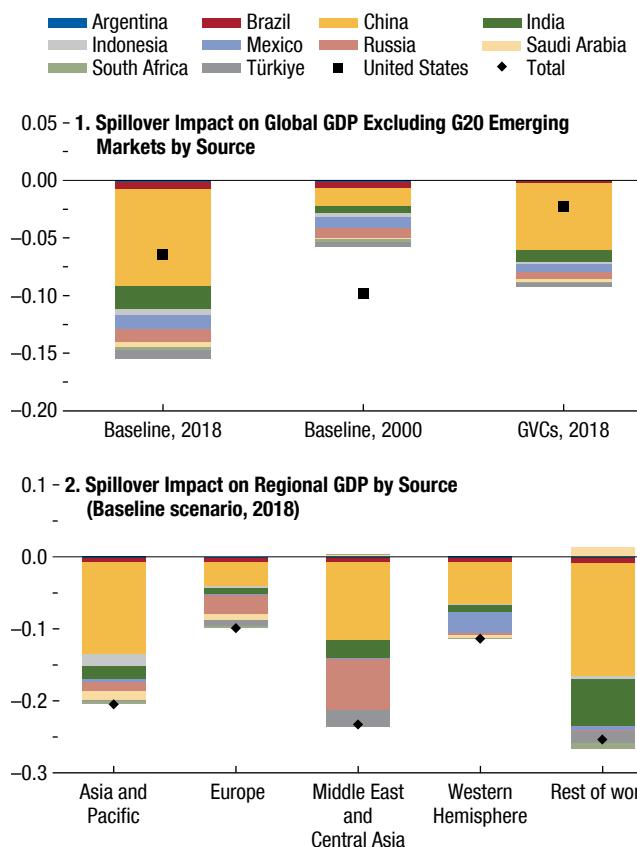
Calibrating the baseline model using trade and input-output data from 2000 reveals that spillovers in 2018 had become almost three times larger than those two decades earlier, which confirms that G20 EMs have indeed gained importance as their share of global trade has grown (Figure 4.10, panel 1, middle bar). Spillovers from the United States, in contrast, have remained broadly similar over time and, if anything, have diminished slightly (see squares in Figure 4.10, panel 1). It is worth noting that the spillovers from the model are smaller than the shorter-term spillovers reported earlier from aggregate demand and supply shocks, reflecting the focus of the model on the long term and the trade channel.¹³

¹¹All three scenarios consider negative productivity shocks: negative responses indicate complementarity, while positive responses indicate competition. As the model used is static, it cannot account for dynamics, and results should be considered as a comparison of two steady states.

¹²Once the domestic impact of the shock and its spillovers to other G20 EMs are considered, the global decline in GDP is 4 percent, and 3.4 percent of this decline is the result of spillovers (including those to other G20 EMs). By comparison, the US shock implies a 1.4 percent decline in global GDP, with spillovers constituting 3.8 percent of the decline.

¹³See Online Annex 4.4 for details of the calibration of the model. In the short term, producers and consumers are less able to substitute for the decline in output by G20 EMs, and hence spillovers to aggregate output are larger. This can be captured qualitatively by assuming a lower trade elasticity: halving the trade elasticity from four to two roughly doubles the impact on global GDP outside G20 EMs from the same TFP shocks.

Figure 4.10. Impact of Spillovers on GDP by G20 Emerging Markets (Percent)



Sources: Bonadio and others 2021, 2023; Huo, Levchenko, and Pandalai-Nayar (forthcoming); Organisation for Economic Co-operation and Development, Inter-Country Input-Output Tables; and IMF staff calculations.

Note: Sample contains 36 advanced economies, 26 emerging market economies, 4 low-income developing countries, and a rest of the world region. The impact on GDP excludes countries shocked in each scenario. GVC = global value chains.

In a second scenario with TFP shocks only to GVC-intensive sectors in G20 EMs, the impact on global GDP outside the G20 EMs is about two-thirds of that in the baseline scenario, despite a domestic impact on G20 EMs that is about one-third as large (Figure 4.10, panel 1, rightmost bar). Applying the same shock to GVC-intensive sectors in the United States generates even smaller spillovers, relative to those from shocks in G20 EMs, than in the baseline scenario, confirming that transmission through GVCs is particularly relevant for shocks originating in these large emerging markets.

Decomposing the global impact across economies and regions shows a generalized but differentiated decline in output (Figure 4.10, panel 2). Asian

economies are significantly affected, as TFP shocks from China dominate, though India also has a significant role. The rest of the world region—which includes most low-income developing countries and makes up about 10 percent of global GDP—is even more affected. In this case, India plays a more important role than it does for other regions, primarily because of shocks to coke and refined petroleum products and basic metals, reflecting these industries' large demand for commodity exports by economies in the rest of the world region. Except for those from China, spillovers from other G20 EMs tend to permeate mostly regionally—in line with the findings for short-term aggregate spillovers. Comparing across regions, European economies tend to be the most insulated, with the impact driven more by the shock to Russia. For the Americas, shocks from China are the largest contributor to the spillovers, but those from Mexico are also important, particularly in Central and North America.

The multisector trade model can be exploited further to evaluate the impact of shocks from G20 EMs on sectors in other economies. This analysis is important for policymakers to understand, as aggregate negative spillovers mask large reallocations across sectors and economies:

- Under the baseline scenario, most sectors contract—agriculture, mining, utilities, and trade and services, especially in Asia—as trade slows down (Figure 4.11, panel 1). On the other hand, most manufacturing sectors contract less than others (for example, wood products and nonmetallic mineral products), while some even expand (for example, textiles, basic metals, and electrical equipment). That is, despite the negative aggregate impact, there is some reallocation of activity between sectors.
- The degree of reallocation is amplified under the second scenario, in which the negative supply shock is concentrated in GVC-intensive sectors. Indeed, the standard deviation of the changes in global sectoral value added outside of the G20 EMs increases by nearly one-third, with the number of sectors expanding increasing from 5 to 15. In this scenario, most manufacturing sectors expand (for example, textiles, metals, and electronics) as domestic firms take advantage of the decrease in supply from competing firms in G20 EMs (Figure 4.11, panel 2)—this is consistent with

the negative downstream spillovers highlighted in the firm-level analysis.¹⁴

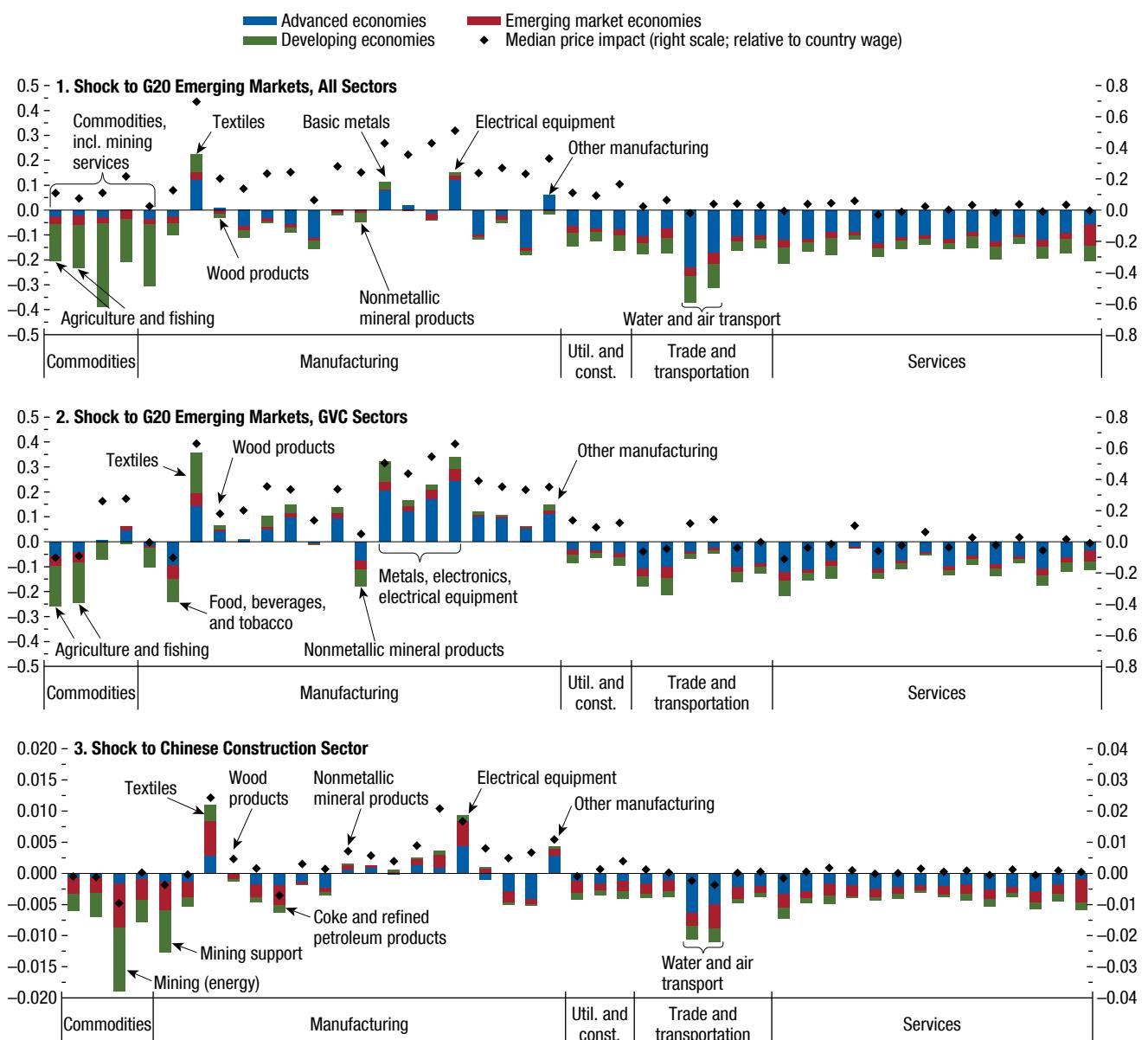
Both the decline in the production of basic commodities and the expansion of textiles production in the second scenario are driven by emerging market and developing economies, in line with their role in commodity exports and the findings of Chapter 3 of the October 2023 WEO. Meanwhile, the expansion of manufacturing sectors and the decline in services are concentrated in advanced economies and reflect their relatively more advanced technologies and larger share of the global economy (Figure 4.11, panel 2). The correlation between the change in sectoral value added and the change in prices shows the role of the price signal in inducing sectoral reallocation.

Motivated by the protracted weakness of the Chinese property sector (IMF 2024), the final scenario focuses on the propagation of a negative 2.5 percent productivity shock to the construction sector in China, which generates a 6 percent contraction in the value added of that sector and a half percent contraction in other sectors in China's economy. Globally, this drives the largest declines in sectoral value added in the production of energy commodities, particularly in mining, suggestive of upstream propagation to inputs to the Chinese construction sector. Consistent with this hypothesis, air and water transportation also contract. Meanwhile, textiles production expands significantly, alongside that of electrical equipment, which points to domestic downstream linkages in China propagating to other economies through higher prices in downstream sectors in which China is an important player in GVCs (Figure 4.11, panel 3).¹⁵

¹⁴Mano (2016) applies a similar modeling framework to China, in which the rebalancing from investment toward consumption and movement along the value chain can have important spillovers and generate significant sectoral reallocation. An important caveat is that the results depend on the extent of substitutability and complementarity implied by the calibration of the model. Indeed, halving the trade elasticity from four to two delivers significantly less short-term expansion in sectoral value added, along both the intensive and extensive margins. The sensitivity of results to different parameters is discussed in Online Annex 4.4.

¹⁵Alternative scenarios provide substantially different results. For instance, a positive shock to India's information technology sector, shown in Online Annex 4.4, exhibits significantly less variation in the sectoral responses, with this smaller variation driven by a large contraction of the information technology sector outside India, which is the result of increased competition, whereas all other sectors expand.

Figure 4.11. Changes in Sectoral Value Added and Prices (Percent)



Sources: Bonadio and others 2021, 2023; Huo, Levchenko, and Pandalai-Nayar (forthcoming); Organisation for Economic Co-operation and Development, Inter-Country Input-Output Tables; and IMF staff calculations.

Note: Sample contains 36 advanced economies, 26 emerging market economies, 4 low-income developing countries, and a rest of the world region. Developing economies include the rest of the world region. Bars indicate the change in global sectoral value added excluding countries shocked in each scenario. See Figure 4.1 for a list of G20 EMs. GVC = global value chain; incl. = including; Util. and const. = Utilities and construction.

Spillovers to Sectoral Employment

The spillovers to sectoral activity from productivity shocks originating in G20 EMs inevitably have implications for sectoral employment. In contrast with the previous subsection, which assessed specific downside scenarios, this subsection considers spill-

overs from *positive* sectoral TFP shocks in any G20 economy-sector pair. Where sectoral activity comoves positively in response to the positive shock in a particular economy-sector pair, employment will also increase, while employment declines in those sectors where activity comoves negatively. Going one step

Table 4.1. Sectors in G20 Economies with the Largest Employment Spillovers

Advanced Economies			Emerging Market Economies		
Source Group	Source Sector	Number of Destination Sectors Affected	Source Group	Source Sector	Number of Destination Sectors Affected
1. Complementarity					
AE	Financial and insurance activities	6	EM	Computer, electronic, and optical products	12
EM	Computer, electronic, and optical equipment	6	EM	Textiles, textile products, leather, and footwear	2
AE	Motor vehicles, trailers, and semi-trailers	5	EM	Mining and quarrying, energy producing products	2
AE	Professional, scientific, and technical activities	4	EM	Basic metals	2
EM	Textiles, textile products, leather, and footwear	3	EM	Machinery and equipment	2
AE	Wholesale, and retail trade	2	AE	Coke and refined petroleum products	2
EM	Basic metals	1	EM	Coke and refined petroleum products	2
			EM	Motor vehicles, trailers, and semi-trailers	1
			EM	Wholesale and retail trade	1
			AE	Computer, electronic, and optical equipment	1
			AE	Education	1
			AE	Wholesale and retail trade	1
			AE	Basic metals	1
2. Competition					
AE	Wholesale and retail trade	12	AE	Wholesale and retail trade	7
AE	Professional, scientific, and technical activities	3	EM	Textiles, textile products, leather, and footwear	6
EM	Wholesale and retail trade	3	EM	Agriculture, hunting, forestry	5
EM	Machinery and equipment	2	EM	Wholesale and retail trade	3
AE	Administrative and support services	2	AE	Agriculture, hunting, forestry	2
AE	Accommodation and food service activities	1	EM	Food products, beverages, and tobacco	2
EM	Textiles, textile products, leather, and footwear	1	EM	Mining and quarrying, energy producing products	2
EM	Computer, electronic, and optical equipment	1	AE	Motor vehicles, trailers, and semi-trailers	1
EM	Education	1	EM	Computer, electronic, and optical equipment	1
EM	Accommodation and food service activities	1	AE	Mining and quarrying, energy producing products	1

Sources: Bonadio and others 2021, 2023; Huo, Levchenko, and Pandalai-Nayar (forthcoming); Organisation for Economic Co-operation and Development (OECD), Inter-Country Input-Output Tables; OECD, Trade in Employment Database; and IMF staff calculations.

Note: Sample covers G20 economies, excluding Australia; regional aggregates for Asia and Pacific, Middle East and Central Asia, Europe, and Western Hemisphere; and a rest of the world aggregate. Computed using the contribution to total employment from each economy-sector's response to all possible positive productivity shocks from the source economy-sector. The source sectors driving the top three sector responses by economy in which employment positively comoves with the economy-sector in which the shock originates are summarized under "Complementarity" (panel 1), while negative comovement between economy-sectors is summarized under "Competition" (panel 2). Thus, the entries in the two columns "Number of Destination Sectors Affected" in each panel sum to $57 = 19$ economies \times 3 sectors. AE = advanced economy; EM = emerging market.

further, it is possible to catalog the economy-sector pairs in the G20 in which positive productivity shocks have the largest positive (“complementarity”) or negative (“competition”) employment spillovers on other economy-sector pairs in the G20 (Table 4.1).¹⁶

Overall, positive sectoral productivity shocks in G20 economies tend to increase employment in other foreign sectors along the global value chain while simultaneously displacing jobs in the same sectors abroad.

Manufacturing sectors in G20 EMs—notably China—remain an important source of positive spillovers for one another, while positive spillovers from advanced economies to emerging markets in these sectors are less widespread. For advanced economies, the largest positive employment spillovers from G20 EMs (mostly China) tend to emanate from computer, electronic, and optical equipment, as well as textiles. In addition to these sectors, emerging markets also see greater job opportunities materializing from positive shocks in basic metals, machinery, and energy commodities in G20 EMs (predominantly China and Saudi Arabia). In contrast, positive employment spillovers between advanced economies are driven by shocks to both services—financial and insurance activities and professional, scientific, and technical activities (from the United States)—and manufacturing, such as motor vehicles (from Germany and the United States).

Turning to negative employment spillovers, services and higher-tech manufacturing in advanced economies are identified as sectors that are most negatively exposed to positive shocks in G20 EM sectors, while agriculture and relatively low-tech manufacturing, such as textiles, are at the highest risk of job losses in emerging markets. In both cases, China again emerges as a key source of spillovers. Positive shocks from services sectors in advanced economies stand out as sources of negative spillovers to both income groups (wholesale and retail trade, from France, Germany, and the United States) and advanced economies (professional, scientific and technical activities, from the

¹⁶This subsection combines the global trade model with employment data and considers data for 19 countries (all G20 economies excluding Australia), four regional aggregates (Asia and Pacific, Europe, Middle East and Central Asia, and Western Hemisphere), and a rest of the world aggregate. Details on the construction of Table 4.1 are provided in Online Annex 4.4. The results from the same exercise using data from 2000 are reported, showing a smaller role for shocks from G20 EMs, consistent with the latter’s increasing global trade footprint, and with results more concentrated in commodity sectors, consistent with the movement of G20 EMs up the value chain.

United States).¹⁷ Moving to spillovers from G20 EMs, the sectors that generate the largest negative employment spillovers for advanced economies are wholesale and retail trade and machinery and equipment (from China), while the most influential sectors for emerging markets are textiles (from China) and agriculture (from Brazil, China, and Russia).

Can the Other G20 Emerging Markets Support Global Growth?

This final section of the chapter uses simulations from the IMF’s Global Integrated Monetary and Fiscal (GIMF) model to consider the extent to which spillovers from G20 EMs (excluding China) could support global and regional growth.¹⁸ To investigate the potential for a G20 EM upside scenario using the model, a series of positive short-term five-year aggregate demand and supply shocks—to household consumption and private investment—is constructed for each of the G20 EMs excluding China. The size of the shock is calibrated to capture a plausible upside to the WEO baseline: specifically, a 30 percent probability that growth in each G20 EM simultaneously could be higher than in this scenario.¹⁹

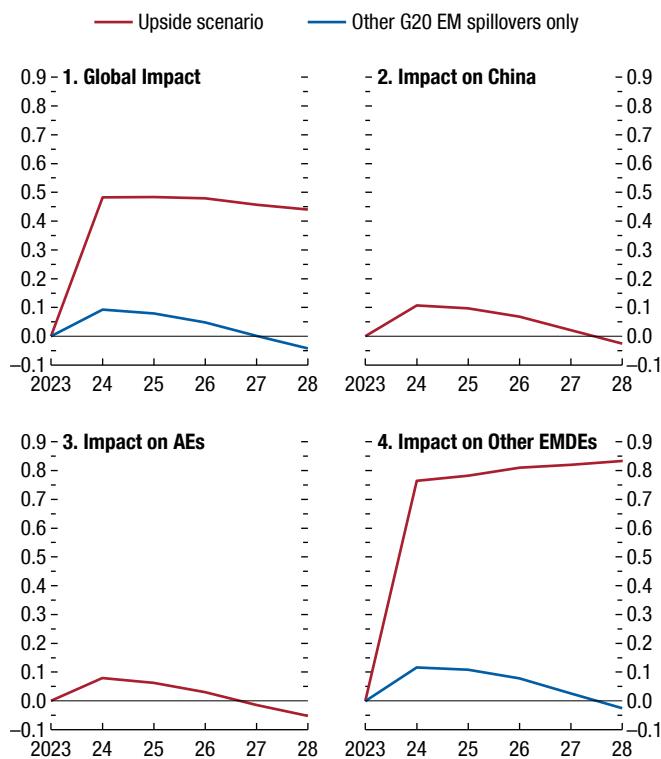
These positive shocks raise aggregate GDP growth for the other G20 EMs by 0.7 percentage point over the WEO forecast horizon, though with substantial heterogeneity among them. Global growth also accelerates by half a percentage point. About 85 percent is driven by the size of the shocks, while the remaining 15 percent results from the other G20 EM spillovers

¹⁷Wholesale and retail trade (International Standard Industrial Classification, Revision 4, Code G) includes import and export activities. The prevalence of wholesale and retail trade among the most affected sectors in part reflects the significant employment share of that sector—on average 15 percent of employment.

¹⁸The scenario is modeled using a new version of GIMF augmented with an aggregate representation of GVCs. GIMF is similar to most macro-focused dynamic stochastic general equilibrium models in that the standard trade elasticities imply easy adjustment of real exchange rates, even in the long term, limiting the movement of spillovers through trade channels. This version of GIMF with GVCs includes roundabout production in the GVC sector, which amplifies the impacts of shocks on trade flows involved in GVCs. For more details on the model and this scenario, see Online Annex 4.5.

¹⁹The size of the shock is specific to the growth distribution of each emerging market economy, based on the confidence bands for the G20 economies, as described in Chapter 1 of the April 2023 *World Economic Outlook* (Box 1.3). For specifics on the methodology and the model associated with it, the IMF’s G20 model, see Andrle and Hunt (2020) and Andrle and others (2015).

Figure 4.12. What Is the Global Impact from a G20 Emerging Market Upside Scenario on Real GDP?
(Percent; deviations from baseline)



Source: IMF staff calculations.

Note: See Figure 4.1 for a list of G20 EMs. AEs = advanced economies; EMs = emerging markets; EMDEs = emerging market and developing economies.

onto one another, China, and the advanced economies (Figure 4.12, panel 1).

Spillovers on growth are more than 0.1 percentage point for the first few years in China (Figure 4.12, panel 2), whereas in advanced economies they are less than 0.1 percentage point per year and two-thirds the size of the impact on growth in China (Figure 4.12, panel 3). For advanced economies, spillovers originate mostly in energy exporters and Mexico—because of its strong ties with the United States. Finally, spillovers between emerging markets are larger and account for 13 percent of their growth pickup (Figure 4.12, panel 4). As an example, upside shocks in India play a prominent role through GVCs and as a source of additional demand.

Conclusions and Policy Implications

Stronger global integration, notably through trade and GVCs, means that domestic shocks in G20 EMs can drive larger spillovers to the global economy—in

some cases now comparable in size to spillovers from advanced economies—and generate employment gains and losses through the reallocation of activity across sectors and economies. Looking forward, deeper geoeconomic fragmentation, by reshaping trade and investment flows along geopolitical fault lines (see Box 1.1 and Gopinath and others 2024), could reduce cross-country diversification and increase macroeconomic volatility. In addition, stronger trade and financial linkages within blocs could amplify regional spillovers from some G20 EMs (China, Russia), while price volatility for key commodities could increase (see Chapter 3 of the October 2023 WEO).

The growing importance of spillovers from domestic shocks in G20 EMs has implications for (1) the design of sound domestic macroeconomic policies directed at building buffers over the medium term against negative spillovers (for advanced and other emerging market and developing economies) and managing domestic shocks (for G20 EMs) and (2) multilateral cooperation and policy coordination.

As policymakers in *advanced economies* continue to try to manage the downward drift in inflation without damaging growth, they should be sensitive to spillovers from G20 EMs, notably those from supply-side shocks. For *emerging market and developing economies*, spillovers can be sizable and could put growth and income convergence at risk. The need to build buffers to better manage negative shocks poses pressing policy challenges in a context still characterized by the scars of the pandemic and subsequent shocks and by limited fiscal space, especially in poorer economies. As a source of larger global and regional spillovers—much like advanced economies—the *emerging markets of the G20* need to continue to strengthen their monetary, fiscal, and financial frameworks, while assessing their impact on other economies. Depending on country specificities, priorities could entail strengthening fiscal positions to provide buffers, reducing current account deficits to minimize external vulnerabilities, or reducing balance sheet vulnerabilities to ensure financial stability.

The reallocation across firms and sectors resulting from shocks in G20 EMs suggests that policymakers should pursue policies directed at taking advantage of new opportunities and at mitigating the effects on sectors and firms that are more exposed to negative spillovers.

- Given the potential for gains in some sectors from cross-border spillovers, policymakers should prioritize the design of a well-calibrated package

of structural reforms to sustain growth, even when fiscal policy space is limited. These reforms could cover governance, the external sector, labor markets, and business regulation, among other areas. Policies should be targeted to sectors that stand to benefit most from reallocation. In this context, industrial policies, including large-scale subsidies or export restrictions, should be used only amid large market failures or externalities, as they can deepen fragmentation through adverse cross-border spillovers.

- Policymakers should avoid protectionist measures to insulate domestic sectors from foreign competition, as these are likely to trigger retaliation from trading partners and can generate welfare losses. By contrast, sectors and firms hit by negative spillovers could be supported by inclusive policies—including targeted

fiscal support—that facilitate efficient reallocation of labor across sectors, upgrades in skills, adaptation to increased competition from emerging markets, and mitigation of the harmful distributional impact of the spillovers (see Chapter 2 of the October 2019 WEO). Other structural reforms, such as promoting competition to prevent increases in market power or improving access to credit for viable firms, would also foster reallocation.

The continued rise of G20 EMs also underscores the need for effective multilateral cooperation and international policy coordination to manage spillovers and minimize fragmentation risks. Strengthening the global financial safety net would allow a timely and effective response to the costs of negative cross-border spillovers.

Box 4.1. Industrial Policies in Emerging Markets: Old and New

This box investigates the impact of domestic subsidies on trade flows to and from G20 EMs. As governments increasingly resort to industrial policies to achieve both economic and noneconomic objectives, the number of subsidies has more than tripled during the past decade. Data from the Global Trade Alert database—which records policy changes that are likely to discriminate against foreign firms—indicate that by 2022, about 6,000 policies entailing domestic subsidies were in force in G20 EMs alone (Figure 4.1.1, panel 1).

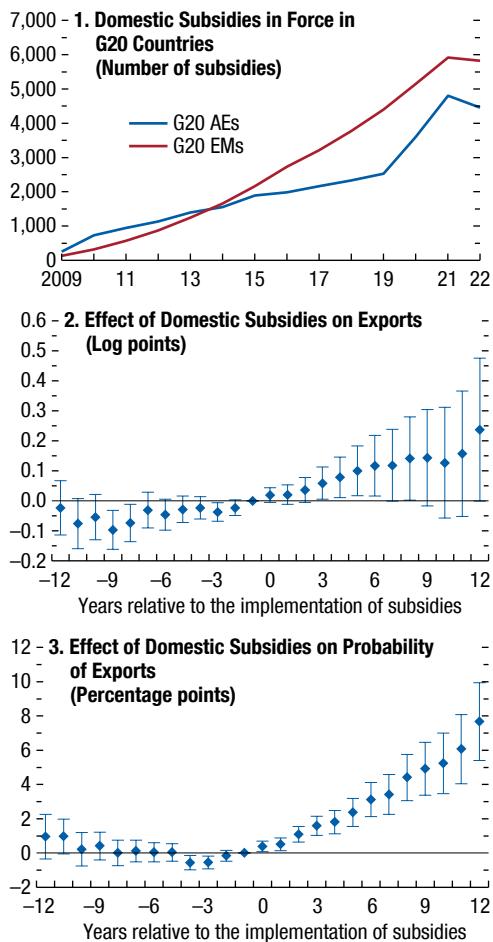
Subsidies can affect trade patterns by shaping firm-level productivity and industry-level comparative advantage (for instance, by promoting research and development in targeted firms or sectors, as discussed in Chapter 2 of the April 2024 *Fiscal Monitor*). Figure 4.1.1 (panels 2 and 3) shows the effects of domestic subsidies on goods exports using a difference-in-differences model that compares subsidized and unsubsidized products, before and after a subsidy's introduction.

At the intensive margin, exports of subsidized products grow faster over the course of the eight years following the introduction of the measure, at which time changes in exports of these products are about 10 percent higher than those of other products. At the extensive margin, domestic subsidies increase the probability of a product being exported by 3 percentage points relative to that for other products. While a similar analysis for imports does not show significant effects, the pro-trade effect of subsidies is confirmed in a gravity model, in which subsidies are found to increase international trade relative to domestic sales.

These results highlight how domestic subsidies in G20 EMs can alter comparative advantage patterns and hence affect export dynamics. Because these measures can have strong trade spillovers, international cooperation is needed to attenuate the possibility of a subsidy war through tit-for-tat behavior by others (Evenett and others 2024).

The authors of this box are Lorenzo Rotunno and Michele Ruta. The box draws from Rotunno and Ruta (2024).

Figure 4.1.1. The Rise of Domestic Subsidies and Their Impact on Exports



Sources: Global Trade Alert database; Rotunno and Ruta 2024; and IMF staff calculations.

Note: In panel 1, subsidies are defined as government measures that involve a financial transfer and create an advantage for the beneficiaries. Data exclude measures classified as export subsidies and include only measures that are classified as “distortionary” (discriminating against foreign interests). In panel 2 and panel 3, the sample includes G20 EMs. The charts plot the estimates and 90 percent confidence intervals on the subsidy dummy interacted with periods before and after the treatment. The specification includes dummies for other policies, country-product fixed effects, country-product linear time trends, product-year and country-ISIC 2-digit-year fixed effects. See Figure 4.1 for a list of G20 EMs. AEs = advanced economies; EMs = emerging markets.

Box 4.2. Capital Flows to G20 Emerging Markets and the Allocation Puzzle

This box investigates the determinants behind the volume and distribution of net capital flows to emerging markets. The *Lucas paradox* refers to the observation that capital does not flow from capital-rich developed economies to more capital-poor developing economies in the amount the neoclassical growth model would predict. This result could be explained by differences in human capital as well as capital market imperfections (Lucas 1990), frictions associated with national borders (Kalemlı-Özcan and others 2010), institutional quality (Alfaro, Kalemlı-Özcan, and Volosovych 2008), and the degree of capital account openness (Reinhardt, Ricci, and Tressel 2013).

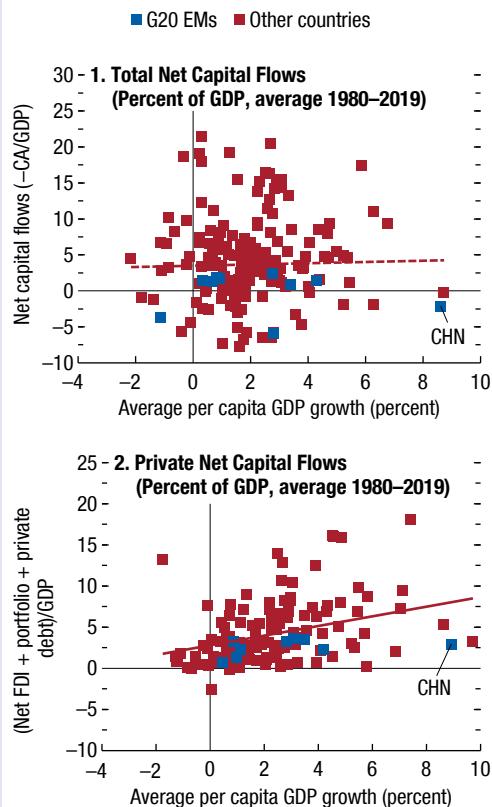
Subsequent research has documented that not only have capital flows from rich to poor economies been low, but their allocation across developing economies is negatively correlated or uncorrelated with productivity growth—the *allocation puzzle*, as defined by Gourinchas and Jeanne (2013). Differences between public and private flows could explain the puzzle: sovereign-to-sovereign transactions account for upstream capital flows, while private capital flows downstream; that is, it is positively correlated with countries' productivity growth (Aguiar and Amador 2011; Alfaro, Kalemlı-Özcan, and Volosovych 2014; Aguiar 2023).

Revisiting the allocation puzzle for a large sample of countries between 1980 and 2019 confirms the lack of a clear pattern between total net capital flows and growth (Figure 4.2.1, panel 1). However, private capital flows do exhibit a clear positive correlation with growth (Figure 4.2.1, panel 2), as predicted by the neoclassical theory. The allocation puzzle is therefore driven largely by public flows, which, in turn, are influenced by net accumulation of reserves by faster-growing emerging markets.

The positive correlation between private flows and growth suggests that the increased financial integration by G20 EMs, as documented in this chapter, will continue to benefit these economies. Overall, capital flows can bring substantial benefits for countries by allowing

The authors of this box are Andrés Fernández Martín, Michael Gottschalk, and Manuel Pérez-Arribal.

Figure 4.2.1. Capital Flows to Emerging Markets: Revisiting the Allocation Puzzle



Sources: Alfaro, Kalemlı-Özcan, and Volosovych 2014; and IMF staff calculations.

Note: Net flows are scaled by GDP. Lines report the estimated slope via ordinary least squares; solid (dashed) lines are (not) statistically significant at 10 percent or less. Average per capita GDP growth rates correspond to the period with available capital flow data. The sample comprises 178 countries in panel 1 and 135 in panel 2. See Figure 4.1 for a list of G20 EMs. CA = current account; CHN = China; EMs = emerging markets; FDI = foreign direct

agents to smooth consumption, finance investment, and contribute to a more efficient allocation of resources (IMF 2012). Policies that make good use of these benefits while managing the risks associated with capital flow volatilities ought to be promoted.

Box 4.3. Spillovers from G20 Emerging Markets to Sub-Saharan Africa

This box focuses on growth spillovers from G20 EMs to sub-Saharan Africa. Trade integration with G20 EMs has increased substantially over the past two decades, driven by China's rising share in the region's goods trade (Figure 4.3.1, panel 1). China's importance for the region is also reflected in its large investment and official lending flows (Horn, Reinhart and Trebesch 2021; Chen, Fornino, and Rawlings 2024). However, other G20 EMs are also strongly connected to sub-Saharan Africa, through trade and foreign direct investment (Figure 4.3.1, panel 2). While greater integration has spurred robust growth, it has also increased the region's exposure to global shocks. For instance, weak growth prospects in China could impact the region through lower cross-border investment and weaker external demand (see Box 1.2 and the October 2023 *Regional Economic Outlook: Sub-Saharan Africa*).

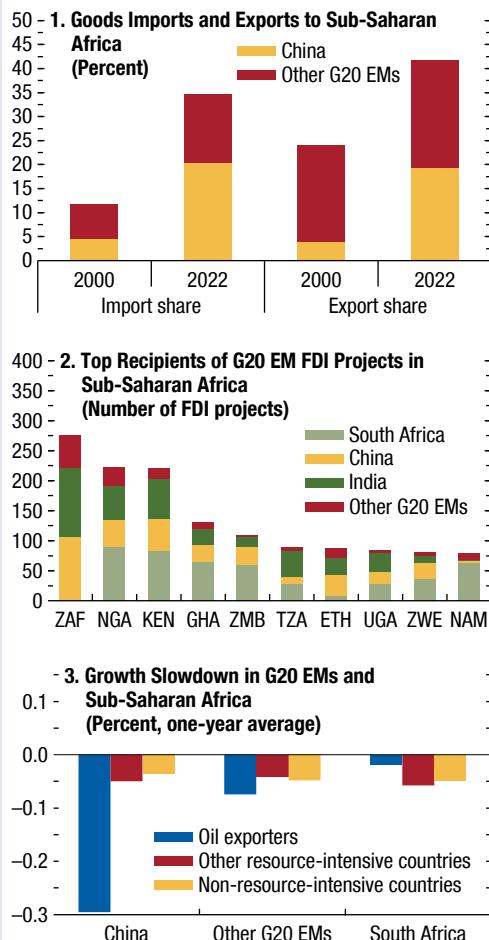
A global vector autoregression (GVAR) model is employed to quantify the impact of possible growth slowdowns in China, other G20 EMs, and South Africa on sub-Saharan African countries (excluding South Africa).¹ As expected, spillovers from China dominate, with commodity exporters—notably oil exporters (for example, Angola, Chad, and Nigeria)—particularly vulnerable: a 1 percentage point decline in growth in China leads to an average growth reduction after one year of about 0.3 percentage point in oil exporters and 0.05 percentage point in other resource-intensive countries (Figure 4.3.1, panel 3).

The regional impact of a growth shock in South Africa is comparable to those of other G20 EMs, but it is largest for non-oil exporters and highly differentiated across countries. Regional spillovers from South Africa are strongest for members of the Southern African Customs Union (Botswana, Eswatini, Lesotho, Namibia), up to 0.3 percentage point on average—and larger than those from China.

The authors of this box are Hany Abdel-Latif and Andrea F. Presbitero.

¹The GVAR model discussed in this box employs annual data from 1990 to 2022 for 71 countries, including most sub-Saharan African economies. Countries are linked in the model through a bilateral trade weight matrix based on 2017–19 averages.

Figure 4.3.1. Role of G20 Emerging Markets in Sub-Saharan Africa



Sources: fDi Markets; IMF, *Direction of Trade Statistics*; and IMF staff calculations.

Note: The first panel shows the share of imports (exports) of goods for China and other G20 EMs to sub-Saharan African countries. Data labels in the second panel use International Organization for Standardization (ISO) country codes. The third panel shows first-year average responses to a 1 percentage point negative shock in China, other G20 EMs, and South Africa for sub-Saharan African countries (excluding South Africa). Country groupings are detailed in the October 2023 *Regional Economic Outlook: Sub-Saharan Africa*. See Figure 4.1 for a list of G20 EMs. EM = emerging market; FDI = foreign direct investment.

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