

INTERNATIONAL MONETARY FUND

WORLD ECONOMIC OUTLOOK

Navigating Global Divergences

2023
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ASSUMPTIONS AND CONVENTIONS

A number of assumptions have been adopted for the projections presented in the *World Economic Outlook* (WEO). It has been assumed that *real effective exchange rates* remained constant at their average levels during July 25, 2023–August 22, 2023, except for those currencies participating in the European exchange rate mechanism II, which are assumed to have remained constant in nominal terms relative to the euro; that established *policies of national authorities* will be maintained (for specific assumptions about fiscal and monetary policies for selected economies, see Box A1 in the Statistical Appendix); that the average price of oil will be \$80.49 a barrel in 2023 and \$79.92 a barrel in 2024; that the *three-month government bond yield* for the United States will average 5.3 percent in 2023 and 5.4 percent in 2024, that for the euro area will average 3.0 percent in 2023 and 3.2 percent in 2024, and that for Japan will average –0.2 percent in 2023 and –0.1 percent in 2024; and that the *10-year government bond yield* for the United States will average 3.8 percent in 2023 and 4.0 percent in 2024, that for the euro area will average 2.4 percent in 2023 and 2.6 percent in 2024, and that for Japan will average 0.5 percent in 2023 and 0.6 percent in 2024. These are, of course, working hypotheses rather than forecasts, and the uncertainties surrounding them add to the margin of error that would, in any event, be involved in the projections. The estimates and projections are based on statistical information available through September 25, 2023.

The following conventions are used throughout the WEO:

- . . . to indicate that data are not available or not applicable;
- – between years or months (for example, 2022–23 or January–June) to indicate the years or months covered, including the beginning and ending years or months; and
- / between years or months (for example, 2022/23) to indicate a fiscal or financial year.
- “Billion” means a thousand million; “trillion” means a thousand billion.
- “Basis points” refers to hundredths of 1 percentage point (for example, 25 basis points are equivalent to $\frac{1}{4}$ of 1 percentage point).
- Data refer to calendar years, except in the case of a few countries that use fiscal years. Please refer to Table F in the Statistical Appendix, which lists the economies with exceptional reporting periods for national accounts and government finance data for each country.
- For some countries, the figures for 2022 and earlier are based on estimates rather than actual outturns. Please refer to Table G in the Statistical Appendix, which lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments for each country.

What is new in this publication:

- *Ecuador’s* fiscal sector projections, which were previously omitted due to ongoing program discussions, are now included.
- *Eritrea’s* data and projections for 2020–28 are excluded from the database due to constraints in data reporting.
- *Sri Lanka’s* projections for 2023–28 are excluded from publication owing to ongoing discussions on sovereign debt restructuring.
- *Ukraine’s* projections for 2024–28, in line with the program’s baseline scenario, are now included.
- For *West Bank and Gaza*, certain projections for 2022–28 are excluded from publication pending methodological adjustments to statistical series.

In the tables and figures, the following conventions apply:

- Tables and figures in this report that list their source as “IMF staff calculations” or “IMF staff estimates” draw on data from the WEO database.
- When countries are not listed alphabetically, they are ordered on the basis of economic size.
- Minor discrepancies between sums of constituent figures and totals shown reflect rounding.
- Composite data are provided for various groups of countries organized according to economic characteristics or region. Unless noted otherwise, country group composites represent calculations based on 90 percent or more of the weighted group data.
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PREFACE

The analysis and projections contained in the *World Economic Outlook* are integral elements of the IMF's surveillance of economic developments and policies in its member countries, of developments in international financial markets, and of the global economic system. The survey of prospects and policies is the product of a comprehensive interdepartmental review of world economic developments, which draws primarily on information the IMF staff gathers through its consultations with member countries. These consultations are carried out in particular by the IMF's area departments—namely, the African Department, Asia and Pacific Department, European Department, Middle East and Central Asia Department, and Western Hemisphere Department— together with the Strategy, Policy, and Review Department; the Monetary and Capital Markets Department; and the Fiscal Affairs Department.

The analysis in this report was coordinated in the Research Department under the general direction of Pierre-Olivier Gourinchas, Economic Counsellor and Director of Research. The project was directed by Petya Koeva Brooks, Deputy Director, Research Department, and Daniel Leigh, Division Chief, Research Department.

The primary contributors to this report are Silvia Albrizio, Jorge Alvarez, Mehdi Benatiya Andaloussi, John Bluedorn, Christian Bogmans, Allan Dizioli, Christopher Evans, Christoffer Koch, Toh Kuan, Chiara Maggi, Jorge Miranda Pinto, Jean-Marc Natal, Daa Noureldin, Andrea Pescatori, Ervin Prifti, Marika Santoro, Alexandre Sollaci, Martin Stuermer, Petia Topalova, and Philippe Wingender.

Other contributors include Omer Akbal, Gavin Asdorian, German Villegas Bauer, Jared Bebee, Nina Biljanovska, Marijn Bolhuis, Damien Capelle, Jiaqian Chen, Seung Mo Choi, Yaniv Cohen, Mariarosaria Comunale, Marina Conesa, Pedro de Barros Gagliardi, Wenchuan Dong, Angela Espiritu, Rebecca Eyassu, Carlos Goncalves, Ziyang Han, Youyou Huang, Chris Jackson, Harri Kemp, Benjamin Kett, Divya Kirti, Gene Kindberg-Halon, Eduard Laurito, Jungjin Lee, Nan Li, Weili Lin, Barry Liu, Rui Mano, Carlos Morales, Joseph Moussa, Peter Nagle, Cynthia Nyanhama Nyakeri, Emory Oakes, Chris Papageorgiou, Clarita Phillips, Nicola Pierri, Rafael Portillo, Evgenia Pugacheva, Tianchu Qi, Shrihari Ramachandra, Pedro Rodriguez, Muhammad Ahsan Shafique, Arash Sheikholeslam, Pedro Vitale Simon, Alessandra Sozzi, Alessia de Stefani, Nicholas Tong, Filiz Unsal, Guillermo Verduzco Bustos, Mona Wang, Isaac Pittman Warren, Yarou Xu, Fan Zhang, Jiaqi Zhao, Canran Zheng, Dian Zhi, and Liangliang Zhu.

Gemma Rose Diaz from the Communications Department led the editorial team for the report, with production and editorial support from Michael Harrup, and additional assistance from Lucy Scott Morales, James Unwin, Nancy Morrison, Grauel Group, and Absolute Service, Inc.

The analysis has benefited from comments and suggestions by staff members from other IMF departments, as well as by Executive Directors following their discussion of the report on September 26, 2023. However, estimates, projections, and policy considerations are those of the IMF staff and should not be attributed to Executive Directors or to their national authorities.

Resilient Global Economy Is Limping Along, with Growing Divergences

The global economy continues to recover slowly from the blows of the pandemic, Russia's invasion of Ukraine, and the cost-of-living crisis. In retrospect, the resilience has been remarkable. Despite the disruption in energy and food markets caused by the war, and the unprecedented tightening of global monetary conditions to combat decades-high inflation, the global economy has slowed, but not stalled. Yet growth remains slow and uneven, with growing global divergences. The global economy is limping along, not sprinting.

Global activity bottomed out at the end of last year while inflation—both headline and underlying (core)—is gradually being brought under control. But a full recovery toward prepandemic trends appears increasingly out of reach, especially in emerging market and developing economies.

According to our latest projections, global growth will slow from 3.5 percent in 2022 to 3 percent this year and 2.9 percent next year, a 0.1 percentage point downgrade for 2024 from our July projections. This remains well below the historical average.

Headline inflation continues to decelerate, from 9.2 percent in 2022, on a year-over-year basis, to 5.9 percent this year and 4.8 percent in 2024. Core inflation, excluding food and energy prices, is also projected to decline, albeit more gradually than headline inflation, to 4.5 percent in 2024.

As a result, projections are increasingly consistent with a “soft landing” scenario, bringing inflation down without a major downturn in activity, especially in the United States, where the forecast increase in unemployment is very modest, from 3.6 to 3.9 percent by 2025.

But important divergences are appearing. The slowdown is more pronounced in advanced economies than in emerging market and developing ones. Within advanced economies, the US surprised on the upside, with resilient consumption and investment, while euro area activity was revised downward. Many emerging market economies proved quite resilient and surprised on the upside, with the notable exception of

China, facing growing headwinds from its real estate crisis and weakening confidence.

Three global forces are at play. First, the recovery in services is almost complete. Over the past year, strong demand for services supported service-oriented economies—including important tourism destinations such as France and Spain—relative to manufacturing powerhouses such as China and Germany. High demand for labor-intensive services also translated into tighter labor markets, and higher and more persistent services inflation. But services activity is now weakening alongside a persistent manufacturing slowdown, suggesting services inflation will decrease in 2024 and labor markets and activity will soften.

Second, part of the slowdown is the result of the tighter monetary policy necessary to bring inflation down. This is starting to bite, but the transmission is uneven across countries. Tighter credit conditions are weighing on housing markets, investment, and activity, more so in countries with a higher share of adjustable-rate mortgages or where households are less willing, or able, to dip into their savings. Firm bankruptcies have increased in the US and the euro area, although from historically low levels. Countries are also at different points in their hiking cycles: advanced economies (except Japan) are near the peak, while some emerging market economies, such as Brazil and Chile, have already started easing.

Third, inflation and activity are shaped by the incidence of last year's commodity price shock. Economies heavily dependent on Russian energy imports experienced a steeper increase in energy prices and a sharper slowdown. Some of our recent work shows that the pass-through from higher energy prices played a large role in driving core inflation upward in the euro area, unlike in the United States, where core inflation pressures reflect instead a tight labor market.

Despite signs of softening, labor markets in advanced economies remain buoyant, with historically low unemployment rates helping to support activity. So far, there is scant evidence of a “wage-price spiral,” and real wages remain below prepandemic levels. Further, many countries experienced a sharp—and welcome—compression

in the wage distribution. Some of this compression reflects the higher amenity value of flexible and remote work schedules for high earners, reducing wage pressures for that group.

Risks

While some of the extreme risks—such as severe banking instability—have moderated since April, the balance remains tilted to the downside.

First, the real estate crisis could deepen further in China, an important risk for the global economy. The policy challenge is complex. Restoring confidence requires promptly restructuring struggling property developers, preserving financial stability, and addressing the strains in local public finance. If real estate prices decline too rapidly, the balance sheets of banks and households will worsen, with the potential for serious financial amplification. If real estate prices are artificially propped up, balance sheets will be protected for a while, but this may crowd out other investment opportunities, reduce new construction activity, and have an adverse impact on local government revenues through reduced land sales. Either way, China's economy needs to pivot away from a credit-driven real estate model of growth.

Second, commodity prices could become more volatile under renewed geopolitical tensions and disruptions linked to climate change. Since June, oil prices have increased by about 25 percent, on the back of extended supply cuts from OPEC+ (the Organization of the Petroleum Exporting Countries plus selected nonmembers) countries. Food prices remain elevated and could be disrupted further by an escalation of the war in Ukraine, causing important hardship for many low-income countries. This, of course, represents a serious risk to the disinflation strategy. Goeconomic fragmentation has also led to a sharp increase in the dispersion in commodity prices across regions, including critical minerals. As Chapter 3 of this report analyzes, this could pose serious macroeconomic risks going forward, including to the climate transition.

Third, while both underlying and headline inflation have decreased, they remain uncomfortably high. Near-term inflation expectations have risen markedly above target, although they now appear to be turning a corner. As Chapter 2 of this report details, bringing these near-term inflation expectations back down is critical to winning the battle against inflation. With tight labor markets, ample

excess savings in some countries, and adverse energy price developments, inflation could become more entrenched, requiring even more forceful action from central banks.

Fourth, fiscal buffers have eroded in many countries, with elevated debt levels, rising funding costs, slowing growth, and an increasing mismatch between the growing demands on the state and available fiscal resources (see the October 2023 *Fiscal Monitor*). This leaves many countries more vulnerable to crises and demands a renewed focus on managing fiscal risks.

Finally, despite the tightening of monetary policy, financial conditions have eased in many countries (see the October 2023 *Global Financial Stability Report*). The danger is of a sharp repricing of risk, especially for emerging markets, that would appreciate further the US dollar, trigger capital outflows, and increase borrowing costs and debt distress.

Policies

Under our baseline scenario, inflation continues to recede as central banks maintain a tight stance. With many countries near the peak of their tightening cycles, little additional tightening is warranted. However, easing prematurely would squander the gains achieved in the past 18 months. Once the disinflation process is firmly on its way and near-term inflation expectations are decreasing, adjusting the policy rate downward will allow the monetary policy stance, that is, the real interest rate, to remain unchanged until inflation targets are in sight.

Fiscal policy needs to support the monetary strategy and help the disinflation process. In 2022, fiscal and monetary policies were pulling in the same direction, as many of the pandemic emergency fiscal measures were unwound. In 2023, the degree of alignment has decreased. Most worrying is the case of the United States, where the fiscal stance has deteriorated substantially. Fiscal policy in the US should not be procyclical, even less so at this stage of the inflation cycle. More broadly, fiscal policy everywhere should focus on rebuilding fiscal buffers that have been severely eroded by the pandemic and the energy crisis, for instance, by removing energy subsidies.

We should also return our focus to the medium term. Here the picture is becoming darker. Medium-term growth prospects are weak, especially for emerging market and developing economies. The implications are profound: a much slower

convergence toward the living standards of advanced economies, reduced fiscal space, increased debt vulnerabilities and exposure to shocks, and diminished opportunities to overcome the scarring from the pandemic and the war.

With lower growth, higher interest rates, and reduced fiscal space, structural reforms become key. Higher long-term growth can be achieved through a careful sequence of structural reforms, especially those focused on governance, business regulations, and the external sector. These “first-generation” reforms help unlock growth and make subsequent reforms—whether to credit markets, or for the green transition—much more effective.

Multilateral cooperation can help ensure that all countries achieve better growth outcomes. First, countries should avoid implementing policies that

contravene World Trade Organization rules and distort international trade. Second, countries should safeguard the flow of critical minerals needed for the climate transition, as well as that of agricultural commodities. Such “green corridors” would help reduce volatility and accelerate the green transition.

Finally, all countries should aim to limit geoeconomic fragmentation that prevents joint progress toward common goals and instead work toward restoring trust in rules-based multilateral frameworks that enhance transparency and policy certainty and help foster a shared global prosperity. A robust global financial safety net with a well-resourced IMF at its center is essential.

Pierre-Olivier Gourinchas
Economic Counsellor

EXECUTIVE SUMMARY

The global recovery from the COVID-19 pandemic and Russia's invasion of Ukraine remains slow and uneven. Despite economic resilience earlier this year, with a reopening rebound and progress in reducing inflation from last year's peaks, it is too soon to take comfort. Economic activity still falls short of its pre-pandemic path, especially in emerging market and developing economies, and there are widening divergences among regions. Several forces are holding back the recovery. Some reflect the long-term consequences of the pandemic, the war in Ukraine, and increasing geoeconomic fragmentation. Others are more cyclical in nature, including the effects of monetary policy tightening necessary to reduce inflation, withdrawal of fiscal support amid high debt, and extreme weather events.

Global growth is forecast to slow from 3.5 percent in 2022 to 3.0 percent in 2023 and 2.9 percent in 2024. The projections remain below the historical (2000–19) average of 3.8 percent, and the forecast for 2024 is down by 0.1 percentage point from the July 2023 *Update to the World Economic Outlook*. For advanced economies, the expected slowdown is from 2.6 percent in 2022 to 1.5 percent in 2023 and 1.4 percent in 2024, amid stronger-than-expected US momentum but weaker-than-expected growth in the euro area. Emerging market and developing economies are projected to have growth modestly decline, from 4.1 percent in 2022 to 4.0 percent in both 2023 and 2024, with a downward revision of 0.1 percentage point in 2024, reflecting the property sector crisis in China. Forecasts for global growth over the medium term, at 3.1 percent, are at their lowest in decades, and prospects for countries to catch up to higher living standards are weak. Global inflation is forecast to decline steadily, from 8.7 percent in 2022 to 6.9 percent in 2023 and 5.8 percent in 2024. But the forecasts for 2023 and 2024 are revised up by 0.1 percentage point and 0.6 percentage point, respectively, and inflation is not expected to return to target until 2025 in most cases.

Risks to the outlook are more balanced than they were six months ago, on account of the resolution of US debt ceiling tensions and Swiss and US authorities' having acted decisively to contain financial turbulence. The likelihood of a hard landing has receded, but the balance of risks to global growth remains tilted to the downside. China's property sector crisis could deepen, with global spillovers, particularly for commodity exporters. Elsewhere, as Chapter 2 explains, near-term inflation expectations have risen and could contribute—along with tight labor markets—to core inflation pressures persisting and requiring higher policy rates than expected. More climate and geopolitical shocks could cause additional food and energy price spikes. As Chapter 3 explains, intensifying geoeconomic fragmentation could constrain the flow of commodities across markets, causing additional price volatility and complicating the green transition. Amid rising debt-service costs, more than half of low-income developing countries are in or at high risk of debt distress.

There is little margin for error on the policy front. Central banks need to restore price stability while using policy tools to relieve potential financial stress when needed. As Chapter 2 explains, effective monetary policy frameworks and communication are vital for anchoring expectations and minimizing the output costs of disinflation. Fiscal policymakers should rebuild budgetary room for maneuver and withdraw untargeted measures while protecting the vulnerable. Reforms to reduce structural impediments to growth—by, among other things, encouraging labor market participation—would smooth the decline of inflation to target and facilitate debt reduction. Faster and more efficient multilateral coordination is needed on debt resolution to avoid debt distress. Cooperation is needed as well to mitigate the effects of climate change and speed the green transition, including (as Chapter 3 explains) by ensuring steady cross-border flows of the necessary minerals.

Growing Global Divergences

More than three years after the global economy suffered the largest shock of the past 75 years, the wounds are still healing, amid widening growth divergences across regions. After a strong initial rebound from the depths of the COVID-19 pandemic, the pace of recovery has moderated. Several forces are holding back the recovery. Some reflect the long-term consequences of the pandemic, Russia's war in Ukraine, and increasing geoeconomic fragmentation. Others are more cyclical, including the effects of monetary policy tightening necessary to reduce inflation, withdrawal of fiscal support amid high debt, and extreme weather events.

Despite signs of economic resilience earlier this year and progress in reducing headline inflation, economic activity is still generally falling short of prepandemic (January 2020) projections, especially in emerging market and developing economies (Figure 1.1, panel 1). The strongest recovery among major economies has been in the United States, where GDP in 2023 is estimated to exceed its prepandemic path. The euro area has recovered, though less strongly—with output still 2.2 percent below prepandemic projections, reflecting greater exposure to the war in Ukraine and the associated adverse terms-of-trade shock, as well as a spike in imported energy prices. In China, the pandemic-related slowdown in 2022 and the property sector crisis contribute to the larger output losses of about 4.2 percent, compared with prepandemic predictions. Other emerging market and developing economies have seen even weaker recoveries, especially low-income countries, where output losses average more than 6.5 percent. Higher interest rates and depreciated currencies have exacerbated the difficulties of low-income countries, placing more than half either at high risk of distress or already in distress. Overall, global output for 2023 is estimated at 3.4 percent (or about \$3.6 trillion in 2023 prices) below prepandemic projections.

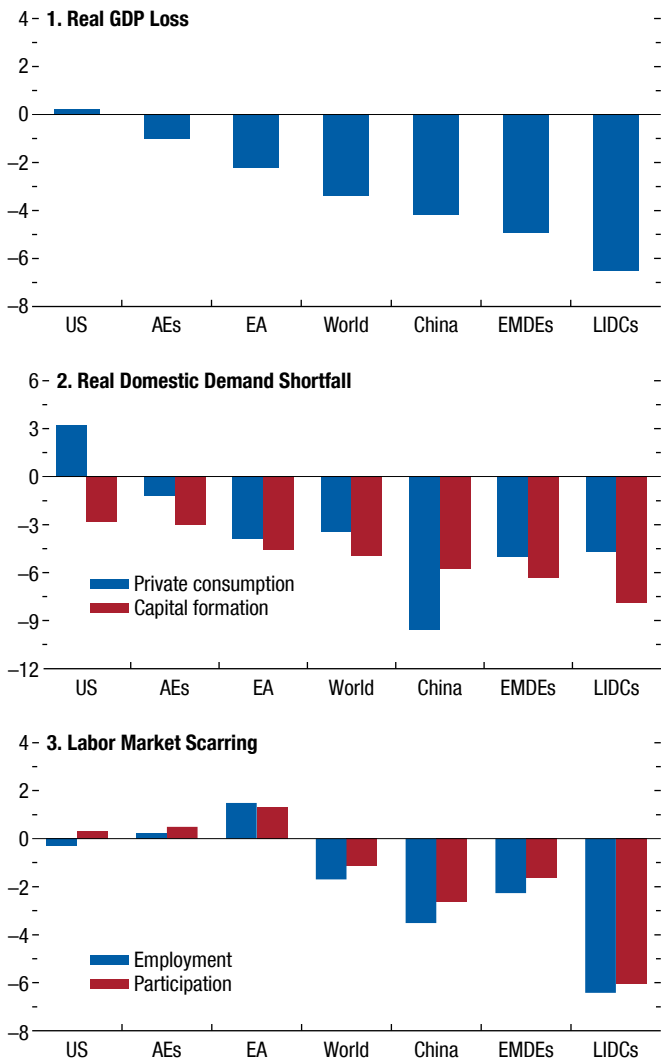
Private consumption has also recovered faster in advanced economies than in emerging market and developing economies, owing to an earlier reopening in the former group facilitated by greater availability of effective vaccines, stronger safety nets, more ample

policy stimulus, and greater feasibility of remote work. These factors supported livelihoods during the pandemic, and household consumption is now broadly back to prepandemic trends. Among advanced economies, private consumption has been stronger in the United States than in the euro area, with households receiving larger fiscal transfers early in the pandemic and spending the associated savings more quickly; being better insulated from the rise in energy prices resulting from the war in Ukraine; and feeling relatively confident amid historically tight US labor markets, which have supported real disposable incomes (Figure 1.1, panel 2). Among emerging market and developing economies, the consumption shortfall is particularly large in China, reflecting tight restrictions on mobility during the COVID-19 crisis.

Divergences in labor market performance across regions broadly mirror those for output and consumption. Employment and labor participation rates are estimated to exceed prepandemic trends in advanced economies but to remain significantly below them in emerging market and developing economies, reflecting more severe output losses and much weaker social protection. Countries that had the most limited fiscal space are also those where employment shortfalls are the largest (ILO 2023). Among advanced economies, the euro area has seen larger employment gains than the United States. This may reflect more extensive use in the former of worker-retention programs modeled on the German *Kurzarbeit* short-time work scheme (IMF 2020), which protect workers' income and allow businesses to retain firm-specific human capital, reducing the costly process of separation, rehiring, and training. In the euro area, these programs bolstered employment during the most challenging phases of the crisis and accelerated the recovery when economies reopened (Figure 1.1, panel 3).

Investment, on the other hand, has uniformly fallen short of prepandemic trends across regions. Businesses have shown less enthusiasm for expansion and risk taking amid rising interest rates, withdrawal of fiscal support, dimmer prospects for product demand, stricter lending conditions, and growing uncertainties

Figure 1.1. Incomplete Recovery: Scarring from the Shocks of 2020–22
(Percent; deviation in 2023 from prepandemic projections)

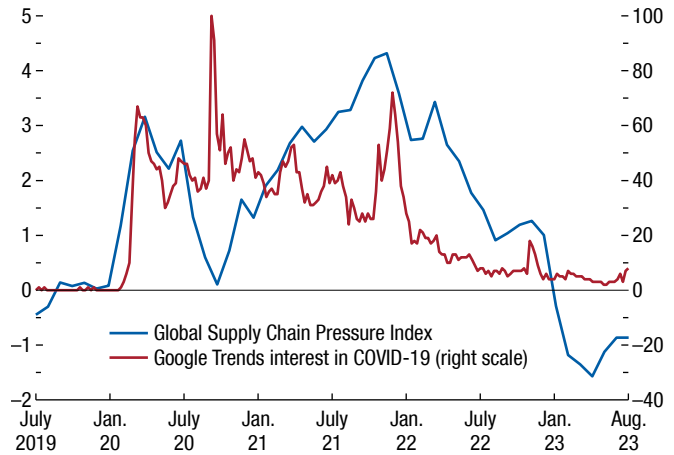


Source: IMF staff calculations.
Note: “Prepandemic projections” refers to those in the January 2020 *World Economic Outlook Update*. AEs = advanced economies; EA = euro area; EMDEs = emerging market and developing economies; LIDCs = low income developing countries.

regarding geoeconomic fragmentation. Higher leverage has further dampened investment (see Chapter 2 of the April 2022 *World Economic Outlook* [WEO]), which remains 3 percent to 10 percent lower across regions than had been projected before the pandemic (Figure 1.1, panel 2).

Moreover, the pandemic, war in Ukraine, and worsening climate shocks have contributed to a reversal in decades-long poverty reduction trends. According to World Bank staff estimates (Mahler and others 2022),

Figure 1.2. The COVID-19 Shock: Returning to Normal
(Standard deviations from average value; index, 100 = highest point worldwide during 2008–23, on right scale)



Sources: Federal Reserve Bank of New York, Global Supply Chain Pressure Index; Google Trends.
Note: On right scale, numbers represent search interest relative to the highest point (100) during 2008–23 worldwide.

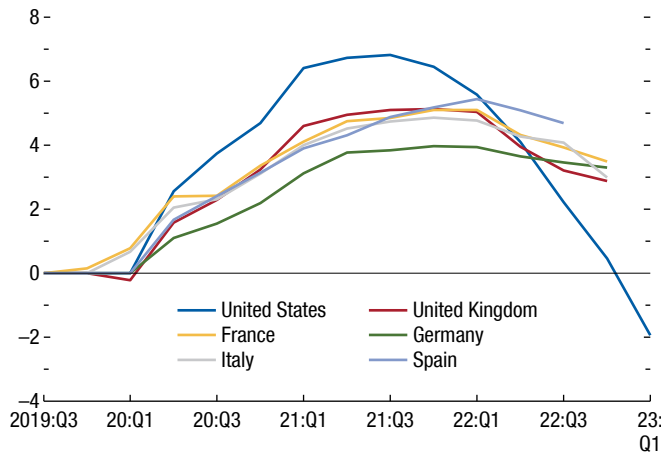
75 million to 95 million more people were living in extreme poverty in 2022 compared with prepandemic estimates. Spikes in food prices and related insecurities following Russia’s invasion of Ukraine, as well as bouts of extreme weather, have accentuated these difficulties. The global average temperature in July 2023 was the highest on record for any month, amid reports of catastrophic flooding, heat waves, and wildfires in many regions. Overall, the global prevalence of undernourishment is significantly higher than before the pandemic (FAO and others 2023).

Resilient Start to 2023, Signs of Slowdown

Despite these persistent challenges, several headwinds to global growth subsided earlier this year. The World Health Organization announced in May that it no longer considered COVID-19 a global health emergency, and infections and hospitalizations appear to remain relatively limited, despite a recent uptick in some regions. Supply chains, which the pandemic disrupted, have largely normalized, with shipping costs and suppliers’ delivery times back to prepandemic levels (Figure 1.2). And global financial conditions eased after Swiss and US authorities took strong action in March to contain turbulence in their banking sectors.

Amid these conditions, global GDP expanded by 3.4 percent in the second quarter of 2023 compared

Figure 1.3. Cumulative Excess Savings in Advanced Economies
(Percent of GDP)



Source: de Soyres, Moore, and Ortiz (2023).
Note: Stock begins accumulating from 0 at $t = -1$, in which $t = 0$ is the first period of low growth due to COVID-19. Excess savings are calculated as deviation from the predicted saving rate using a Hamilton trend.

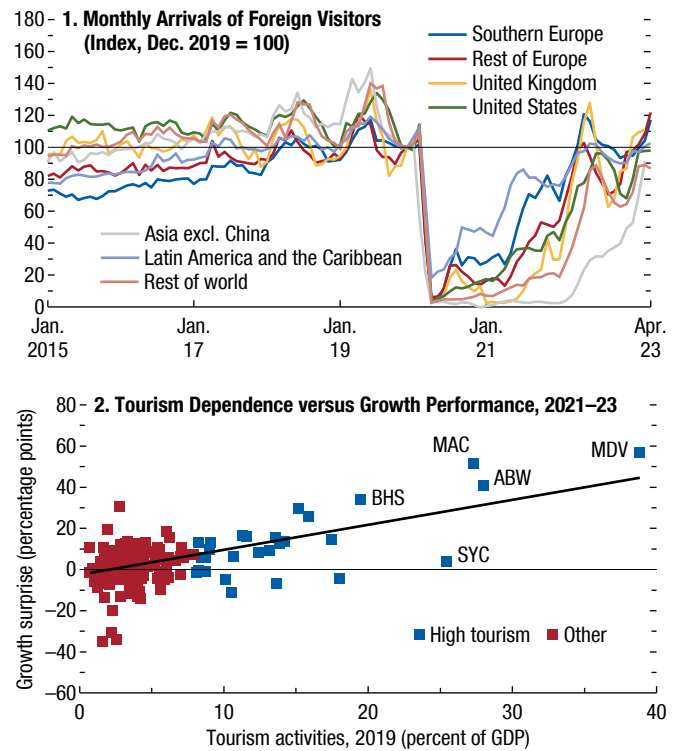
with a year earlier—outperforming forecasts, including those in the April 2023 WEO. The resilience reflected strong consumption amid tight labor markets in the United States and robust activity in economies with large travel and tourism sectors, such as Italy, Mexico, and Spain. These developments offset a slowdown in more interest-rate-sensitive manufacturing sectors.

That said, there are signs the rebound is fading:

- *Diminishing pandemic-era savings:* The stock of savings built during the pandemic, which has so far supported consumers, is declining in advanced economies, especially the United States, as illustrated in Figure 1.3.¹ This implies fewer resources for households to draw on as they contend with a still-elevated cost of living and more restricted credit availability in the context of monetary tightening aimed at reducing inflation.
- *Slowing catch-up in services, including travel:* International tourist arrivals are approaching prepandemic levels in most regions (Figure 1.4, panel 1). The recovery of travel during 2021–23 has come with especially strong economic growth in economies with a large share of tourism activities in GDP

¹Estimates of the stock of excess household savings—the cumulation of saving beyond the prepandemic trend—come with a range of uncertainty and can differ across methodological approaches. For the United States, they generally show a consistent pattern, with the stock declining (see, for example, Abdelrahman and Oliveira 2023).

Figure 1.4. Tourism Returning to Normal



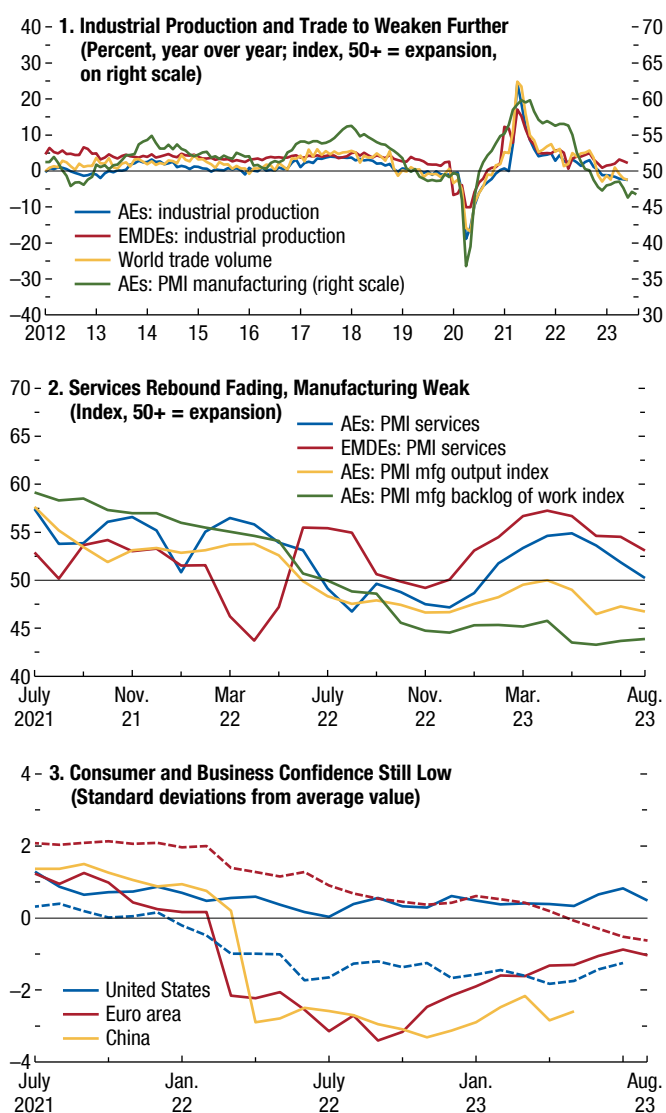
Sources: Haver Analytics; World Travel & Tourism Council; and IMF staff calculations.
Note: In panel 1, series is the normalized sum of arrivals for each region based on data for 41 economies. In panel 2, the x-axis measures the direct share of travel and tourism in GDP in 2019. The growth surprise on the y-axis measures the difference between the cumulative GDP growth in 2021–23 and its projected value in the January 2020 *World Economic Outlook Update*. Data labels in the figure use International Organization for Standardization (ISO) country codes. excl. = excluding.

(Figure 1.4, panel 2). These economies had suffered especially sharp contractions in GDP at the onset of the pandemic (Milesi-Ferretti 2021). But with the recovery in tourism maturing, the boost to growth is waning.² Leading indicators for services now indicate weaker growth or declining output (Figure 1.5, panel 2) in economies that previously enjoyed a strong rebound.

- *Persistent manufacturing slowdown:* Recent data releases point to a wide-ranging slowdown or contraction in the manufacturing sector, with related declines in industrial production, investment, and international trade in goods. This weakness reflects

²A tourism share that is higher by 10 percentage points of GDP comes with cumulative growth that is higher by 12 percentage points in 2021–23 (Figure 1.4, panel 2), but for 2023 alone, the relationship is less than half as strong. Higher-tourism-share economies suffered sharper contractions in 2020 (Milesi-Ferretti 2021).

Figure 1.5. Slower Growth Momentum Ahead



Sources: Haver Analytics; and IMF staff calculations.
 Note: Solid lines in panel 3 show consumer confidence, and dashed lines denote business confidence. AEs = advanced economies; EMDEs = emerging market and developing economies; mfg = manufacturing; PMIs = purchasing managers' indexes.

the combined effects of the postpandemic shift in consumption back toward services, weaker demand stemming from a higher cost of living, the unwinding of crisis policy support, tighter credit conditions, and general uncertainty amid intensified geoeconomic fragmentation (Figure 1.5, panel 1).

Part of the slowdown is policy induced—the result of the globally synchronous central bank tightening of monetary conditions to restore price stability.

Signs that tightening efforts are paying off are increasingly apparent, with global inflation steadily declining from its multidecade peak in 2022 amid tighter credit availability and cooling housing markets. Part of the slowdown also reflects more idiosyncratic developments, such as the property sector crisis in China.

China: Slower Growth

China's growth momentum is fading following a COVID-19 reopening surge in early 2023. Growth slowed from 8.9 percent in the first quarter of 2023 (seasonally adjusted annualized quarterly rate) to 4.0 percent in the second quarter. With ample economic slack and declining energy and food prices, inflation fell to an estimated 0.2 percent (year over year) in the second quarter of 2023.

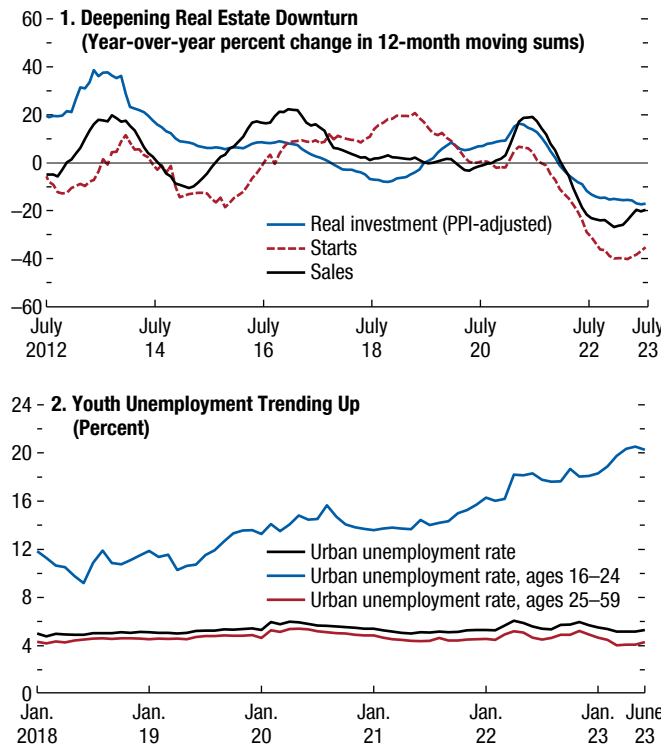
High-frequency indicators suggest further weakness with the property sector crisis in the country leading the factors hampering growth. Country Garden—China's largest property developer and a major beneficiary of government support—is facing severe liquidity stress, a sign that real estate distress is spreading to stronger developers, despite policy easing measures. Property developers face severe funding constraints, preventing them from completing presold homes. This is undermining home buyer confidence and prolonging the property sector downturn. Meanwhile, real estate investment and housing prices continue to decline, putting pressure on local governments' revenues from land sales and threatening already fragile public finances (Figure 1.6, panel 1).

These developments, together with labor market uncertainty—as reflected in elevated youth unemployment that reached more than 20 percent in June 2023 (Figure 1.6, panel 2)—have weighed on consumption. Consumer confidence remains subdued despite the economy's reopening in the first quarter. Industrial production, business investment, and exports are also weakening, reflecting a combination of waning foreign demand and geopolitical uncertainty. Commodity exporters and countries that are part of the Asian industrial supply chain are the most exposed to China's loss of momentum.

Inflation: Nearer, but Not Quite There

Global headline inflation has more than halved, from its peak of 11.6 percent in the second quarter of 2022 (at a quarterly annualized rate) to 5.3 percent

Figure 1.6. China's Economy Losing Momentum

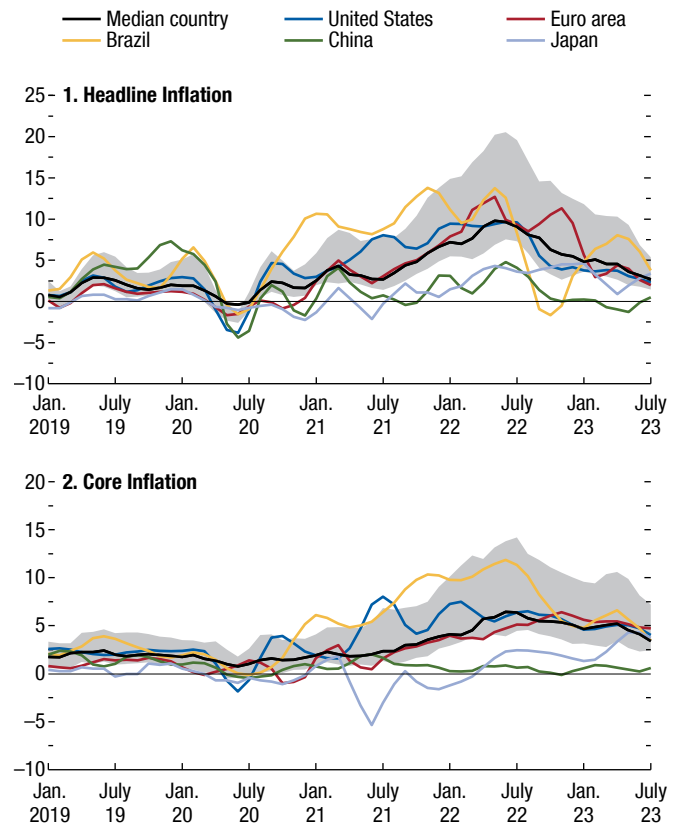


Sources: CEIC Data Company Limited; Haver Analytics; and IMF staff calculations.
Note: In panel 1, real investment denotes PPI-adjusted fixed asset investment in real estate sector. The figure shows year-over-year percent change of housing starts and sales measured in square meters. PPI = producer price index.

in the second quarter of 2023. About four-fifths of the gap between the 2022 peak and the prepandemic (2017–19) annual average level of 3.5 percent has closed. Among major economies, headline inflation in the second quarter of 2023 ranged from –0.1 percent in China (at a quarterly annualized rate) to 2.8 percent in the euro area and 2.7 percent in the United States (Figure 1.7). A narrowing in the cross-country variation in headline inflation has accompanied the decline. As Figure 1.8 reports, the international distribution of inflation rates widened during the 2022 inflation surge, becoming skewed upward, but has since begun to normalize.

A fall in energy prices and—to a lesser extent—in food prices has driven the decline in headline inflation. As the Commodity Special Feature in this chapter reports, notwithstanding a rebound in July, crude oil prices have declined during 2023 and are well below their June 2022 peak, on the back of lower global demand partly driven by tighter global monetary policy affecting activity. Supply curbs by OPEC+

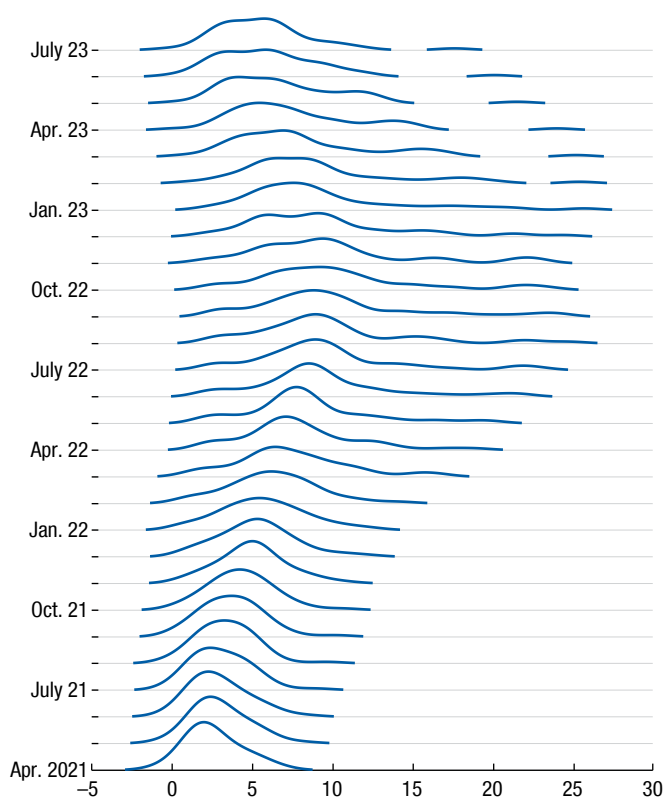
Figure 1.7. Inflation Turning the Corner
(Three-month annualized percent change, seasonally adjusted)



Sources: Haver Analytics; and IMF staff calculations.
Note: The figure shows the developments in headline and core inflation across 17 emerging market and developing economies and 18 advanced economies. The 35 sample economies account for approximately 81 percent of 2022 world output. Core inflation is the change in prices for goods and services, excluding those for food and energy (or the closest available measure). For the euro area (and other European countries for which data are available), energy, food, alcohol, and tobacco are excluded. The grey band depicts the 25th to 75th percentiles of inflation across countries.

(Organization of the Petroleum Exporting Countries plus selected nonmember countries) were partly offset by strong oil output growth in non-OPEC countries, most notably the United States. Natural gas prices also remain well below their 2022 peak, reflecting ample storage and supplies from Norway and northern Africa. Food prices have declined modestly in 2023, with lower demand offset by supply reductions, notably those resulting from Russia's withdrawal from the Black Sea Grain Initiative in July, which reduced the supply of wheat to the global market. The normalization of supply chains has further contributed to the decline in headline inflation in most countries.

Underlying (core) inflation has also declined, but more gradually. Global inflation excluding food and

Figure 1.8. Headline Inflation Distribution*(Percent, year over year)*

Sources: Organisation for Economic Co-operation and Development; and IMF staff calculations.

Note: The figure shows the density distribution of headline inflation developments across 29 advanced economies and 11 emerging market and developing economies.

energy prices is down from a peak of 8.5 percent in the first quarter of 2022 (at a quarterly annualized rate) to 4.9 percent in the second quarter of 2023, nearly two-thirds of the way back to the prepandemic (2017–19) annual average of 2.8 percent. Among major economies, in the second quarter of 2023, it ranged from 0.3 percent in China (at a quarterly annualized rate) to 4.6 percent in the euro area and 4.7 percent in the United States. Data for July indicate a rise in inflation excluding food and energy in most advanced economies; more data releases are needed to assess progress in reducing underlying inflation.

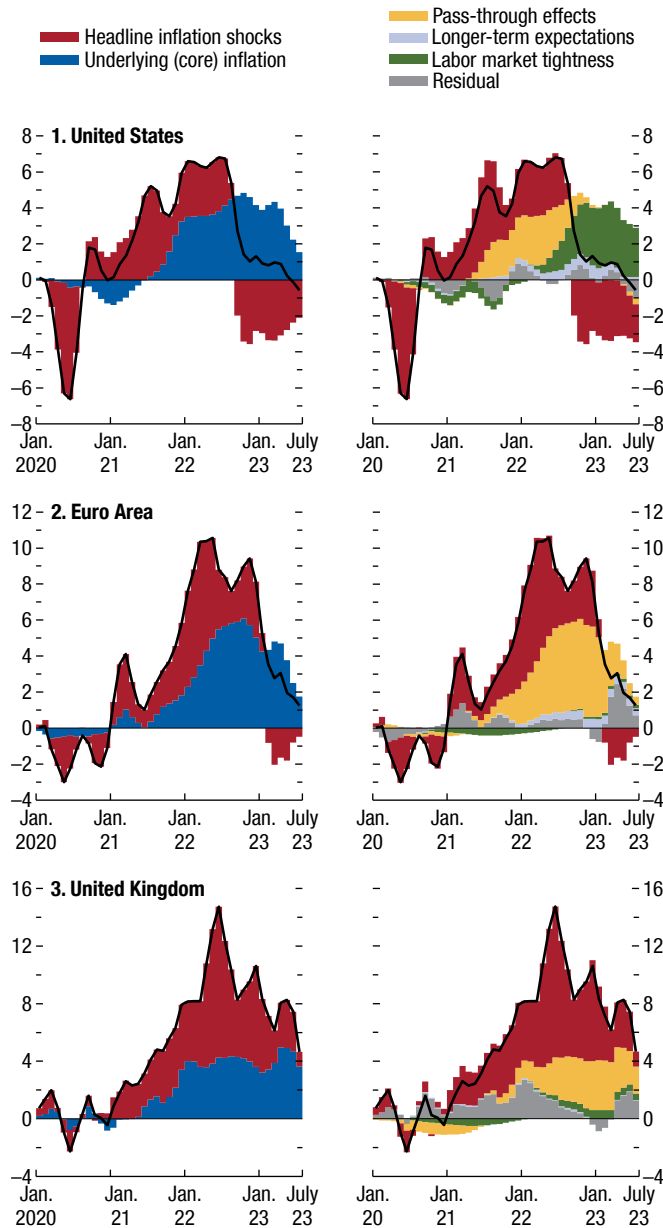
The drivers of core inflation have reflected a combination of demand pressures, as shown in labor market conditions and pass-through effects from past shocks to headline inflation shocks, including those arising from supply shifts in various industries. The roles of

these factors have differed markedly across economies. Demand pressures in some advanced economies arose from significant COVID-19-era fiscal payments to households, as well as from ample monetary policy stimulus early in the pandemic, which supported the recovery in consumer spending. These policy-induced pressures declined as policy support subsided. Pass-through effects include the effects of past relative price shocks—notably those to the price of energy—on prices and costs in other industries through supply chain inputs and wage demands. An important pass-through channel is, as Chapter 2 explains, the rise in near-term inflation expectations, which has implications for both wage and price setting. IMF staff analysis (Figure 1.9) suggests that in the euro area and the United Kingdom, pass-through from past relative price movements—in particular that from energy price shocks associated with external factors—has recently played a larger role than in the United States in driving core inflation (the staff's methodology was the same as that used in Dao and others 2023).

In the United States, labor market tightness has been an especially strong driver. Although labor markets remain tight, especially in the United States, the recent decline in the ratio of vacancies to the number of unemployed people suggests some easing (Figure 1.10). Wage growth has remained contained, with wage-price spirals—in which prices and wages accelerate together for a sustained period—not generally taking hold in advanced economies (Figure 1.11). At the same time, evidence shows that wages at the bottom of the distribution have risen faster than the average, compressing the wage distribution. Longer-term inflation expectations have remained well anchored and contributed little to recent movements in core inflation (Figure 1.9; Chapter 2).

Company profits have increased robustly over the past two years, with wages having risen more slowly than prices (Figure 1.12). For the United States and the euro area, a decomposition of the GDP deflator into labor costs and profits shows that in the early phase of the pandemic (2020–21), profits accounted for most of the rise in prices. But since 2022, labor costs have contributed an increasing share to rising prices—particularly in the United States. The rise in profits (sales revenue minus all costs) does not necessarily signal increased monopoly power, with firms deliberately limiting supplies to raise prices in excess of the cost of producing an additional unit of output (marginal cost). Profits can rise when a surge

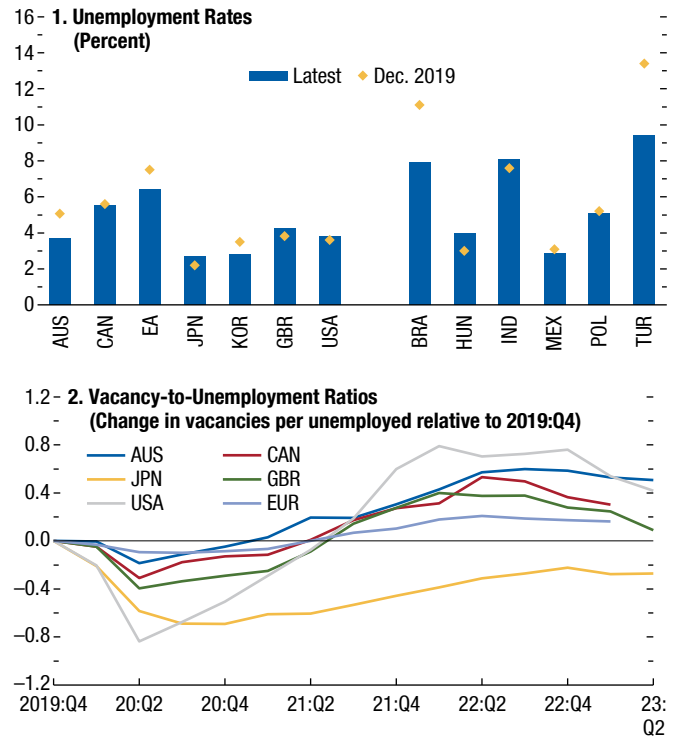
Figure 1.9. Different Drivers: Inflation in Selected Economies
(Percentage points; three-month annualized inflation; deviation from December 2019)



Source: IMF staff calculations.
Note: Underlying (core) inflation denotes weighted median inflation. Methodology is as in Dao and others (2023) and Ball, Leigh, and Mishra (2022).

in demand meets supply constraints or when supply constraints tighten, implying higher prices, and wages do not immediately adjust. As wages start to rise, profits can be expected to erode. Accordingly, IMF staff analysis based on firm-level data indicates little change in firms' markups (prices in excess of

Figure 1.10. Labor Markets Still Tight but Easing



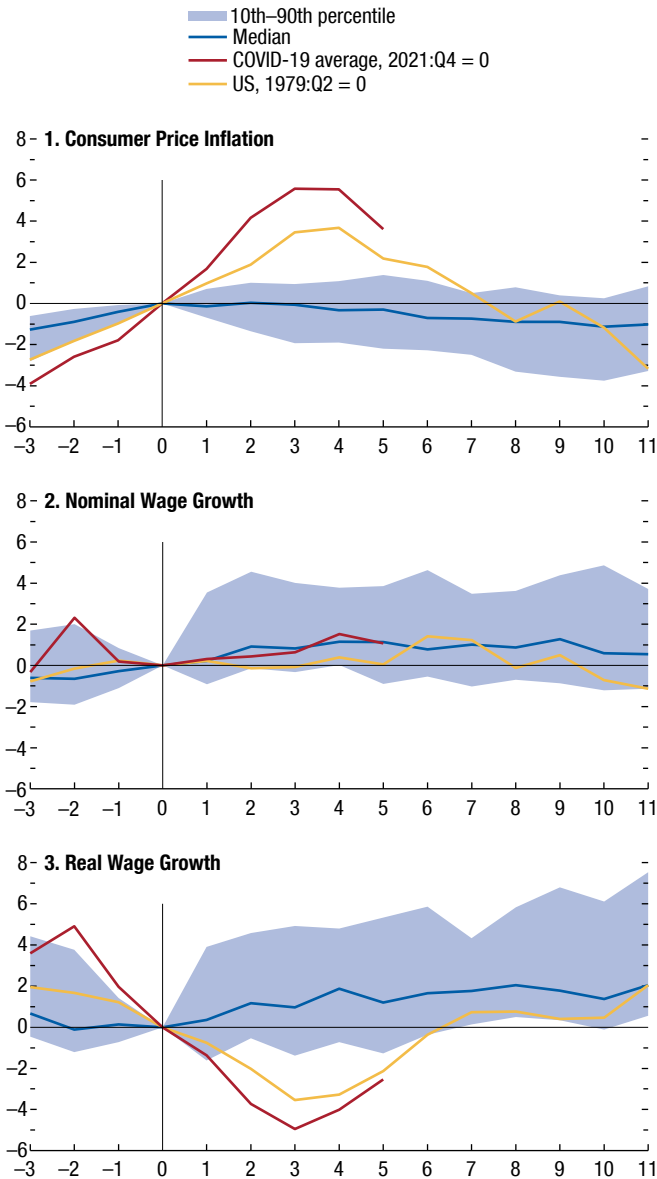
Sources: Eurostat; Haver Analytics; national statistics agencies; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. EA = euro area; EUR = Europe.

marginal cost) across various sectors in major advanced economies during 2019–22.³ Similarly, Colonna, Torrini, and Viviano (2023) conclude that despite profit share increases, firm markups were unchanged or declined across several sectors in Germany and Italy during 2022. Overall, these results suggest that a rise in market power did not significantly contribute to the inflation surge of 2022. Moreover, there is some evidence that since 2022, rising labor costs have accounted for a significantly larger share of US price increases than profits.

Even as central banks have taken decisive action, inflation remains above target in almost all economies with an inflation target. Among major central banks

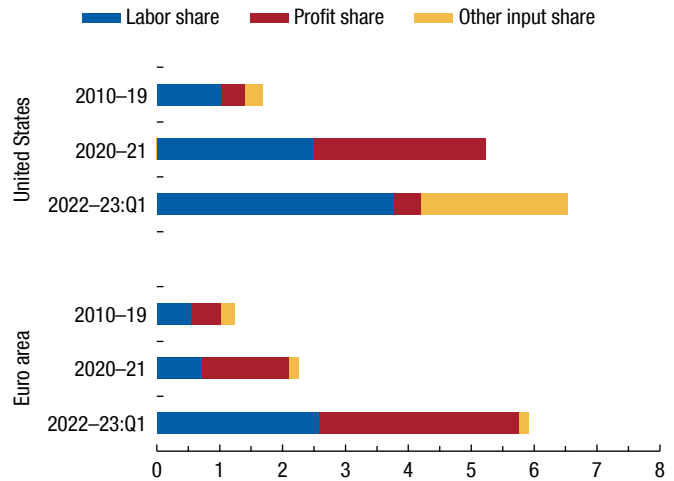
³The IMF staff's methodology is that illustrated in Box 1.2 of the October 2022 *World Economic Outlook*. The "economic markup" (a producer's price over true marginal costs, inclusive of the shadow cost of supply constraints) may be constant even while accounting profits (total revenue minus costs) may show an increase. If supply constraints remain, and nominal wages start to rise, prices could then remain unchanged, with the true markup remaining constant but accounting profits declining.

Figure 1.11. Little Evidence of Wage-Price Spirals
(Percentage point deviation from $t = 0$)



Sources: International Labour Organization; Organisation for Economic Cooperation and Development; US Bureau of Economic Analysis; and IMF staff calculations.
Note: In panel 1, inflation is the year-over-year percent change in the CPI. In panels 2 and 3, nominal and real wages are defined on a per-worker basis. Growth is calculated year over year. The real wage is the nominal wage divided by the CPI. The figure shows developments following episodes in which at least three of the preceding four quarters have (1) accelerating prices or rising price inflation, (2) positive nominal wage growth, (3) falling or constant real wages, and (4) a declining or flat unemployment rate. Twenty-three such episodes are identified within a sample of 33 advanced economies. Data for the COVID-19 episode are the average of data for economies in the sample starting in 2021:Q4. The x-axis shows quarters after episodes. See Chapter 2 of the October 2022 *World Economic Outlook* for details. CPI = consumer price index.

Figure 1.12. Profits and Labor Shares: Accounting for Inflation
(Percent, annualized)



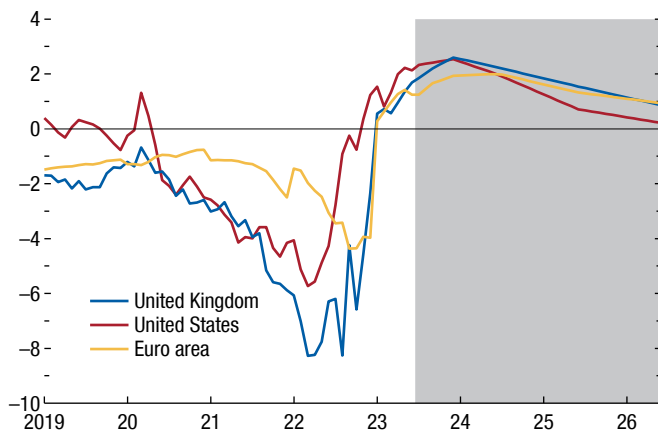
Sources: Eurostat; US Bureau of Economic Analysis; and IMF staff calculations.
Note: US decomposition uses data on factor shares from the nonfinancial corporate sector only. Euro area decomposition is based on whole-economy data.

with inflation above target, the Bank of Canada, the Bank of England, the European Central Bank, and the Federal Reserve all raised rates in July. The Bank of Japan has continued with monetary easing but in July decided to allow more flexibility in the conduct of yield curve control such that the 10-year yield can now rise up to 1 percent. The largest exception to this pattern is China, where headline inflation is subdued and below the authorities’ target and the People’s Bank of China reduced interest rates in June and August.

Tighter Monetary Policy, Tighter Credit

Acute stress in the banking sector has receded. The March 2023 banking scare remained contained and limited to problematic regional banks in the United States and Credit Suisse—a Swiss globally systemically important bank—on account of swift reaction by authorities in both countries. However, rapid rate hikes in major advanced economies over the past 18 months, a necessary response to rapidly rising inflationary pressures, have resulted in a tight monetary policy stance—real rates above neutral rates—that is expected to endure well into 2025 (Figure 1.13). And signs are that tighter monetary policy has started to work its way through the financial system. Lending surveys in the United States and Europe suggest that banks restricted access to credit

Figure 1.13. Monetary Policy to Remain Tight
(Percentage points)

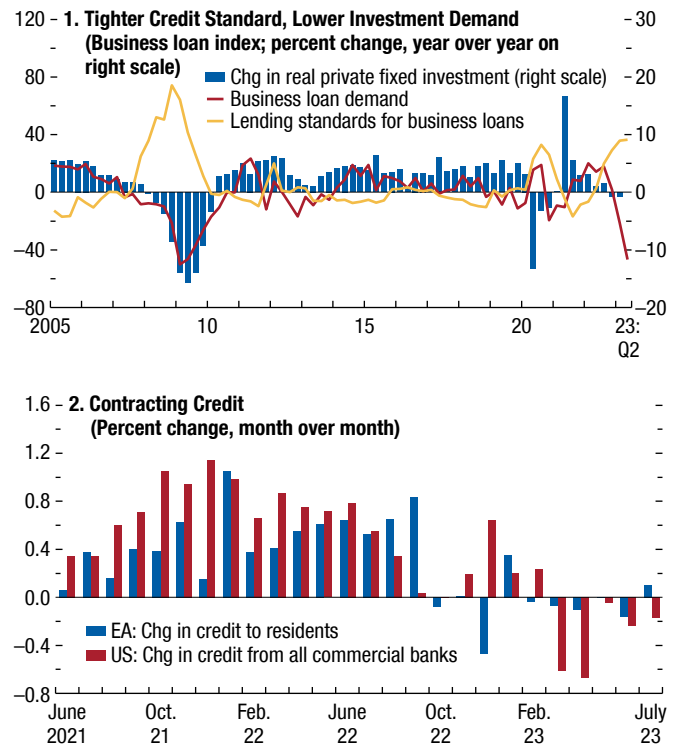


Sources: Bloomberg Finance L.P.; Consensus Economics; Haver Analytics; Platzer and Peruffo (2022); and IMF staff calculations.
 Note: The figure shows the evolution of the monetary policy stance, defined as the difference between real interest rates and the real natural rate of interest. The real interest rate is defined as the difference between the policy rate (actual until June 2023 and market implied from Bloomberg after that) and one-year-ahead inflation expectations. For the United Kingdom and the United States, inflation expectations are market-based and computed from inflation swaps. For the euro area, inflation expectations are from Consensus Economics surveys, and the real natural rate of interest is the weighted average of data for France and Germany.

considerably over the past year and were expected to continue to do so in coming months. And there are also clear signs that tighter credit conditions are increasingly affecting real activity. In advanced economies, credit and investment demand contracted in the first half of the year, reflecting tighter supply as well as lower demand for credit, as many businesses began to deleverage in response to higher interest rates and production overcapacity (Figure 1.14). Higher interest rates are likely to put banks under increasing pressure in major economies, both directly (through higher cost of funding) and indirectly (as credit quality deteriorates). Housing markets have already been reacting, with house prices slowing or reversing since the beginning of the tightening cycle in several countries (Figure 1.15), and bankruptcy rates have increased in some economies (increasing by 20 percent in the United States over the last year) as pandemic-time forbearance measures are phased out. Bankruptcies remain lower than before the pandemic in most countries but are rising rapidly.

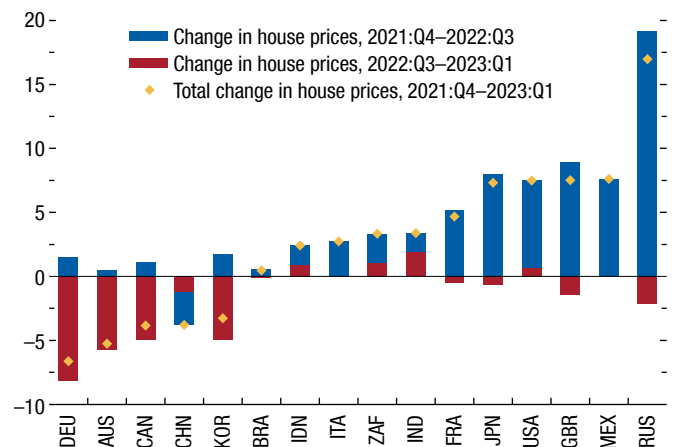
Debt markets have started to reflect tighter monetary policy, whereas spreads to risk-free government debt have stayed more or less constant. This suggests that although credit conditions have tightened significantly, there is no immediate indication of a credit crunch.

Figure 1.14. Credit Channel Active in US and EA



Sources: European Central Bank; Federal Reserve Board; Haver Analytics; and IMF staff calculations.
 Note: In panel 1, lending standards and loan demand are based on answers to the Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending Practices and its European counterpart; positive values indicate that lending standards have been tightened or credit demand has increased on balance in the preceding three months. Data for both business loan demand and lending standards are simple averages of data from US and EA responses. Real private fixed investment is the purchasing-power-parity-weighted average of data for US and EA. Chg = change; EA = euro area.

Figure 1.15. House Prices Slowing or Reversing, 2022–23
(Cumulated percent change)



Sources: Bank for International Settlements; and IMF staff calculations.
 Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

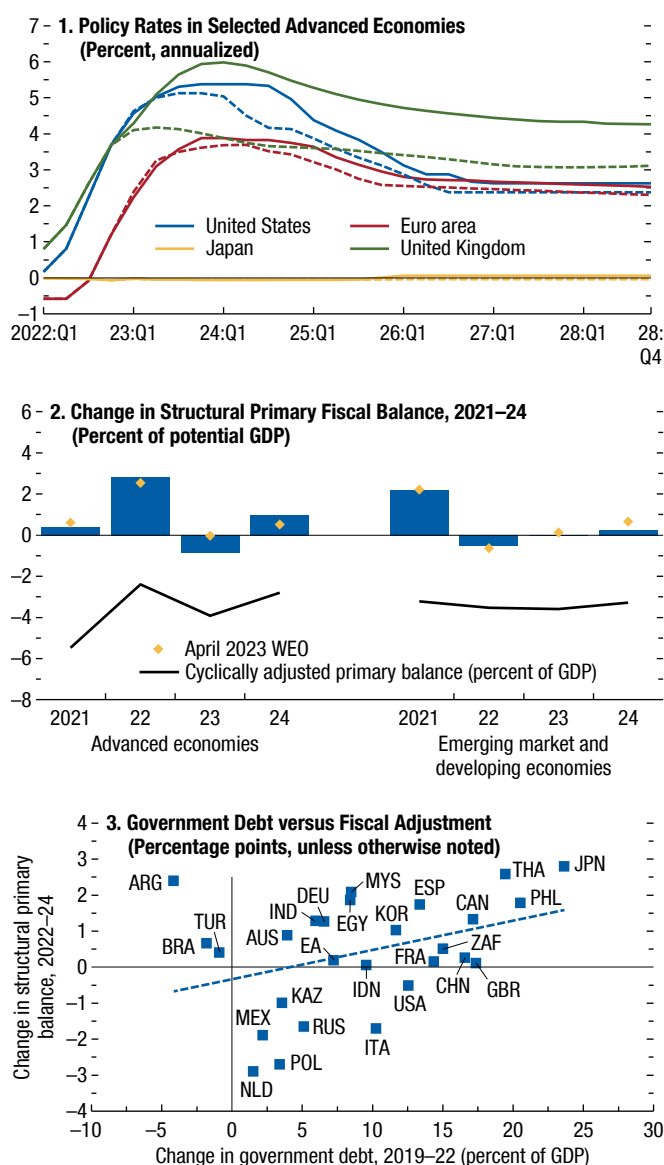
Outlook: Stable but Slow

The latest projections confirm that the global economy is slowing as inflation declines from last year’s multidecade peak. A contraction in global per capita real GDP—which often happens in a global recession—is not part of the baseline scenario. Growth and employment in the first half of the year remained more resilient than forecast in the April 2023 WEO. Although there is little change in the forecast for the global average since the July 2023 WEO *Update*, several shifts in growth and inflation prospects are observed across countries. In addition, medium-term prospects for economic growth remain the lowest in decades, with middle- and lower-income countries facing a slower pace of convergence toward higher living standards.

The baseline forecasts for the global economy are predicated on a number of assumptions (Figure 1.16), notably for fuel and nonfuel commodity prices, as well as the stances of monetary and fiscal policy:

- Commodity price assumptions:** Prices of fuel commodities are projected to fall on average by 36 percent and oil prices by about 17 percent, with the decreases reflecting mainly the slowdown in global economic activity, and natural gas and coal prices to decline from their 2022 peaks by 61 percent and 51 percent, respectively. The forecast for non-fuel commodity prices is a decline of 6.3 percent, on average, in 2023, with prices for base metals expected to decrease by 4.7 percent, the decreases reflecting concerns regarding real estate investment in China. Food commodity prices, after rising by 14.8 percent in 2022, are predicted to decline by 6.8 percent in 2023, with prices remaining well above their 2021 levels. Compared with forecasts in the July 2023 WEO *Update*, an upward revision to wheat prices following the suspension of the Black Sea Grain Initiative (which occurred after the July 2023 WEO *Update* forecasting round) is broadly offset by downward revisions to other food commodity prices.
- Monetary policy assumptions:** Global interest rate assumptions are on average revised upward compared with those in the April 2023 WEO, reflecting actual and signaled policy tightening by major central banks. The Federal Reserve’s policy rate is expected to peak at its current level of about 5.4 percent, the Bank of England to raise its to peak at about 6.0 percent, and the

Figure 1.16. Monetary and Fiscal Policy Assumptions



Source: IMF staff calculations.

Note: In panel 1, solid lines denote assumptions for the October 2023 WEO and dashed lines for the April 2023 WEO. In panel 2, the cyclically adjusted primary balance is the general government balance (excluding interest income or expenses) adjusted for the economic cycle. The structural primary fiscal balance is the cyclically adjusted primary balance corrected for a broader range of noncyclical factors, such as changes in asset and commodity prices. Data labels in the figure use International Organization for Standardization (ISO) country codes. EA = euro area; WEO = *World Economic Outlook*.

European Central Bank to raise its to peak at 3.9 percent in 2023, before all three reduce rates in 2024. The higher policy path over the longer term has contributed to the rise in long-term policy rate assumptions. For Japan, policy rates for the medium term (2026–28) are revised

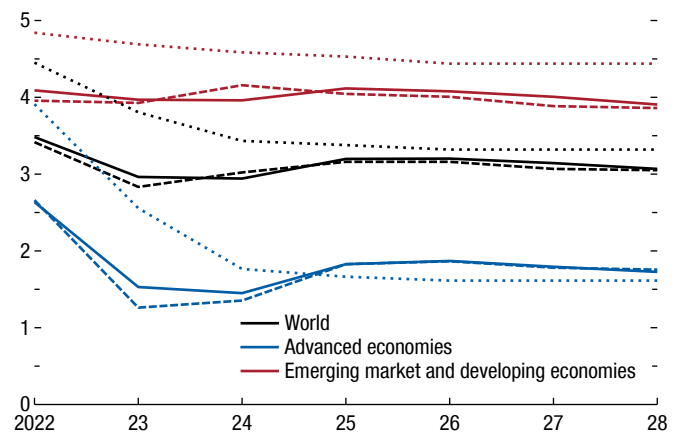
upward, reflecting changes to the country's yield-curve-control framework, and long-term rates are revised upward accordingly. As near-term inflation expectations decline, real interest rates are likely to stay elevated even after nominal rates start to fall. In addition, changes in monetary policy are becoming less synchronous, with some central banks that tightened policy earlier (such as the Central Bank of Brazil) initiating their easing cycle.

- **Fiscal policy assumptions:** Governments in advanced economies are on average expected to ease fiscal policy in 2023, following a rise in fiscal balances in 2022, whereas in emerging market and developing economies, the projected fiscal stance is on average neutral. Fiscal consolidation is expected in 2024 in both groups of economies. Fiscal tightening is on average expected to be greater in economies that recently experienced a sharper rise in government debt (Figure 1.16, panel 3). A rise in government debt amounting to 10 percentage points of GDP during 2019–22 is associated on average with fiscal consolidation (rise in the structural primary balance) of 0.8 percentage point of GDP during 2022–24. Exceptions to this pattern include, for example, Argentina, where despite a decline, debt levels remain high, and the fiscal stance is expected to continue tightening to secure fiscal and debt sustainability.

Growth Outlook: Offsetting Divergences

Global growth is projected to fall from 3.5 percent in 2022 to 3.0 percent in 2023 and 2.9 percent in 2024 on an annual average basis (Table 1.1). There is a downward revision of 0.1 percentage point for 2024 compared with the July 2023 WEO *Update* projection. At the same time, there are more sizable changes in the underlying growth trajectories of major economies, with stronger projections for the United States and downward revisions for China and the euro area. The forecasts for growth during 2023–24 are also slower than those before the onset of the shocks of 2020–22 (Figure 1.17): the January 2022 WEO *Update* projected global growth at 3.8 percent in 2023 and 3.4 percent in 2024. The 2023–24 forecasts are also below the historical (2000–19) annual average of 3.8 percent. Growth is below the historical average across broad income groups, both in overall GDP as well as in per capita GDP. On a year-over-year basis,

Figure 1.17. Growth Outlook: Stable and Slow
(Percent; dashes = April 2023; dots = January 2022)



Source: IMF staff calculations.

Note: Solid lines denote GDP growth from the October 2023 WEO, and dashed lines and dotted lines denote GDP growth forecasts from the April 2023 WEO and the January 2022 WEO *Update*, respectively. WEO = *World Economic Outlook*.

global growth bottomed out in the fourth quarter of 2022. However, in some major economies, it is not expected to have bottomed out until the second half of 2023.

Advanced economies continue to drive the decline in annual average growth from 2022 to 2023, with stronger services activity offset by weaker manufacturing, as well as idiosyncratic factors. On average, these economies are expected to have broadly stable growth in 2024 with a pickup in 2025. By contrast, emerging market and developing economies, on average, are projected to see stable growth over 2022–24, with a slight pickup in 2025, although with sizable shifts across regions.

Growth Forecast for Advanced Economies

For *advanced economies*, the growth slowdown projected is significant—from 2.6 percent in 2022 to 1.5 percent in 2023 and 1.4 percent in 2024—with no overall revision from the July 2023 WEO *Update*, amid stronger-than-expected US momentum and weaker-than-expected growth in the euro area. About 90 percent of advanced economies are projected to see lower growth in 2023. With the projected slowdown in advanced economies, annual unemployment is projected to rise by an average of 0.1 percentage point over 2022–24, although with more pronounced

Table 1.1. Overview of the *World Economic Outlook* Projections
(Percent change, unless noted otherwise)

	2022	Projections		Difference from July 2023 WEO Update ¹		Difference from April 2023 WEO ¹	
		2023	2024	2023	2024	2023	2024
World Output	3.5	3.0	2.9	0.0	-0.1	0.2	-0.1
Advanced Economies	2.6	1.5	1.4	0.0	0.0	0.2	0.0
United States	2.1	2.1	1.5	0.3	0.5	0.5	0.4
Euro Area	3.3	0.7	1.2	-0.2	-0.3	-0.1	-0.2
Germany	1.8	-0.5	0.9	-0.2	-0.4	-0.4	-0.2
France	2.5	1.0	1.3	0.2	0.0	0.3	0.0
Italy ²	3.7	0.7	0.7	-0.4	-0.2	0.0	-0.1
Spain	5.8	2.5	1.7	0.0	-0.3	1.0	-0.3
Japan	1.0	2.0	1.0	0.6	0.0	0.7	0.0
United Kingdom ²	4.1	0.5	0.6	0.1	-0.4	0.8	-0.4
Canada	3.4	1.3	1.6	-0.4	0.2	-0.2	0.1
Other Advanced Economies ³	2.6	1.8	2.2	-0.2	-0.1	0.0	0.0
Emerging Market and Developing Economies	4.1	4.0	4.0	0.0	-0.1	0.1	-0.2
Emerging and Developing Asia	4.5	5.2	4.8	-0.1	-0.2	-0.1	-0.3
China	3.0	5.0	4.2	-0.2	-0.3	-0.2	-0.3
India ⁴	7.2	6.3	6.3	0.2	0.0	0.4	0.0
Emerging and Developing Europe	0.8	2.4	2.2	0.6	0.0	1.2	-0.3
Russia	-2.1	2.2	1.1	0.7	-0.2	1.5	-0.2
Latin America and the Caribbean	4.1	2.3	2.3	0.4	0.1	0.7	0.1
Brazil	2.9	3.1	1.5	1.0	0.3	2.2	0.0
Mexico	3.9	3.2	2.1	0.6	0.6	1.4	0.5
Middle East and Central Asia	5.6	2.0	3.4	-0.5	0.2	-0.9	-0.1
Saudi Arabia	8.7	0.8	4.0	-1.1	1.2	-2.3	0.9
Sub-Saharan Africa	4.0	3.3	4.0	-0.2	-0.1	-0.3	-0.2
Nigeria	3.3	2.9	3.1	-0.3	0.1	-0.3	0.1
South Africa	1.9	0.9	1.8	0.6	0.1	0.8	0.0
<i>Memorandum</i>							
World Growth Based on Market Exchange Rates	3.0	2.5	2.4	0.0	0.0	0.1	0.0
European Union	3.6	0.7	1.5	-0.3	-0.2	0.0	-0.1
ASEAN-5 ⁵	5.5	4.2	4.5	-0.4	0.0	-0.3	-0.1
Middle East and North Africa	5.6	2.0	3.4	-0.6	0.3	-1.1	0.0
Emerging Market and Middle-Income Economies	4.0	4.0	3.9	0.1	0.0	0.1	-0.1
Low-Income Developing Countries	5.2	4.0	5.1	-0.5	-0.1	-0.7	-0.3
World Trade Volume (goods and services)	5.1	0.9	3.5	-1.1	-0.2	-1.5	0.0
Imports							
Advanced Economies	6.7	0.1	3.0	-1.8	-0.1	-1.7	0.3
Emerging Market and Developing Economies	3.2	1.7	4.4	-0.2	-0.5	-1.6	-0.7
Exports							
Advanced Economies	5.3	1.8	3.1	-1.0	-0.1	-1.2	0.0
Emerging Market and Developing Economies	4.1	-0.1	4.2	-1.3	0.1	-1.7	-0.1
Commodity Prices (US dollars)							
Oil ⁶	39.2	-16.5	-0.7	4.2	5.5	7.6	5.1
Nonfuel (average based on world commodity import weights)	7.9	-6.3	-2.7	-1.5	-1.3	-3.5	-1.7
World Consumer Prices⁷	8.7	6.9	5.8	0.1	0.6	-0.1	0.9
Advanced Economies ⁸	7.3	4.6	3.0	-0.1	0.2	-0.1	0.4
Emerging Market and Developing Economies ⁷	9.8	8.5	7.8	0.2	1.0	-0.1	1.3

Source: IMF staff estimates.

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during July 25, 2023–August 22, 2023. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. WEO = *World Economic Outlook*.

¹Difference based on rounded figures for the current, July 2023 WEO *Update*, and April 2023 WEO forecasts.

²See the country-specific notes for Italy and the United Kingdom in the “Country Notes” section of the Statistical Appendix.

³Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

⁴For India, data and forecasts are presented on a fiscal year basis, and GDP from 2011 onward is based on GDP at market prices with fiscal year 2011/12 as a base year.

⁵Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

Table 1.1. Overview of the *World Economic Outlook Projections (continued)*
(Percent change, unless noted otherwise)

	Q4 over Q4 ⁹						
	2022	Projections		Difference from July 2023 WEO Update ¹		Difference from April 2023 WEO ¹	
		2023	2024	2023	2024	2023	2024
World Output	2.2	2.9	3.2	0.0	0.3	0.0	0.1
Advanced Economies	1.2	1.5	1.5	0.1	0.1	0.4	-0.1
United States	0.9	1.9	1.4	0.5	0.3	0.9	0.1
Euro Area	1.7	0.7	1.4	-0.5	-0.1	0.0	-0.4
Germany	0.8	-0.2	1.7	-0.7	0.2	-0.4	-0.1
France	0.7	1.0	1.5	0.1	-0.1	0.2	0.1
Italy ²	1.5	0.3	1.2	-0.6	0.1	-0.1	0.1
Spain	3.8	1.6	2.0	-0.2	-0.2	0.3	-0.1
Japan	0.5	2.1	1.0	0.6	0.0	0.8	0.0
United Kingdom ²	0.6	0.6	0.8	0.1	-0.5	1.0	-1.2
Canada	2.1	1.2	2.1	-0.4	0.3	-0.2	0.3
Other Advanced Economies ³	0.9	2.0	2.2	0.2	0.1	0.1	0.4
Emerging Market and Developing Economies	3.2	4.0	4.7	-0.1	0.6	-0.5	0.3
Emerging and Developing Asia	4.2	5.0	5.5	-0.3	0.6	-0.8	0.2
China	3.2	4.9	4.7	-0.9	0.6	-0.9	0.0
India ⁴	6.1	5.5	7.7	1.2	1.3	-0.7	1.3
Emerging and Developing Europe	-1.2	2.8	2.5	0.1	0.5	0.4	0.0
Russia	-3.1	2.2	1.2	0.3	0.4	1.3	-0.2
Latin America and the Caribbean	2.8	1.5	3.2	0.7	0.3	0.3	1.1
Brazil	2.5	2.1	2.8	0.8	0.6	1.2	0.8
Mexico	4.3	2.6	1.9	0.7	0.2	1.4	0.0
Middle East and Central Asia	...	...	...	...	...	...	...
Saudi Arabia	5.5	0.9	4.0	-1.1	1.1	-2.2	0.8
Sub-Saharan Africa	...	...	...	...	...	...	...
Nigeria	3.2	2.6	3.6	0.0	0.0	-0.4	-0.1
South Africa	1.3	1.6	2.0	0.7	0.0	0.5	0.3
<i>Memorandum</i>							
World Growth Based on Market Exchange Rates	1.8	2.5	2.6	0.0	0.2	0.1	0.0
European Union	1.8	1.0	1.6	-0.5	-0.1	0.0	-0.3
ASEAN-5 ⁵	4.7	4.2	4.6	-0.4	-0.2	-0.1	-0.7
Middle East and North Africa	...	...	...	...	...	...	...
Emerging Market and Middle-Income Economies	3.1	4.0	4.6	-0.1	0.5	-0.5	0.3
Low-Income Developing Countries	...	...	...	...	...	...	...
Commodity Prices (US dollars)							
Oil ⁶	8.8	-2.5	-5.7	10.5	-0.8	14.8	-2.3
Nonfuel (average based on world commodity import weights)	-0.4	-3.1	0.7	-3.1	-0.1	-6.6	1.2
World Consumer Prices⁷	9.2	5.9	4.8	0.4	0.9	0.3	1.1
Advanced Economies ⁸	7.7	3.3	2.6	0.0	0.1	0.1	0.4
Emerging Market and Developing Economies ⁷	10.5	8.1	6.6	0.7	1.5	0.5	1.6

⁶Simple average of prices of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average price of oil in US dollars a barrel was \$96.36 in 2022; the assumed price, based on futures markets, is \$80.49 in 2023 and \$79.92 in 2024.

⁷Excludes Venezuela. See the country-specific note for Venezuela in the "Country Notes" section of the Statistical Appendix.

⁸The inflation rates for 2023 and 2024, respectively, are as follows: 5.6 percent and 3.3 percent for the euro area, 3.2 percent and 2.9 percent for Japan, and 4.1 percent and 2.8 percent for the United States.

⁹For world output, the quarterly estimates and projections account for approximately 90 percent of annual world output at purchasing-power-parity weights. For emerging market and developing economies, the quarterly estimates and projections account for approximately 85 percent of annual emerging market and developing economies' output at purchasing-power-parity weights.

Table 1.2. Overview of the *World Economic Outlook* Projections at Market Exchange Rate Weights
(Percent change)

	2022	Projections		Difference from July 2023 WEO <i>Update</i> ¹		Difference from April 2023 WEO ¹	
		2023	2024	2023	2024	2023	2024
World Output	3.0	2.5	2.4	0.0	0.0	0.1	0.0
Advanced Economies	2.6	1.5	1.4	0.0	0.1	0.3	0.1
Emerging Market and Developing Economies	3.7	4.0	3.8	0.0	-0.1	0.0	-0.2
Emerging and Developing Asia	3.9	5.1	4.6	-0.1	-0.2	-0.1	-0.2
Emerging and Developing Europe	0.4	2.2	2.1	0.6	-0.1	1.2	-0.2
Latin America and the Caribbean	3.9	2.2	2.2	0.4	0.2	0.7	0.1
Middle East and Central Asia	5.8	1.9	3.4	-0.5	0.2	-1.1	-0.1
Sub-Saharan Africa	3.9	3.2	3.9	-0.1	0.0	-0.2	-0.1
<i>Memorandum</i>							
European Union	3.4	0.6	1.3	-0.3	-0.3	-0.1	-0.2
Middle East and North Africa	6.0	1.8	3.4	-0.6	0.3	-1.3	0.1
Emerging Market and Middle-Income Economies	3.6	4.0	3.7	0.0	-0.2	0.1	-0.2
Low-Income Developing Countries	5.1	4.0	5.1	-0.5	-0.1	-0.7	-0.3

Source: IMF staff estimates.

Note: The aggregate growth rates are calculated as a weighted average, in which a moving average of nominal GDP in US dollars for the preceding three years is used as the weight. WEO = *World Economic Outlook*.

¹Difference based on rounded figures for the current, July 2023 WEO *Update*, and April 2023 WEO forecasts.

increases in Canada (1.0 percentage point), the United Kingdom (0.9 percentage point), and the United States (0.2 percentage point). Nevertheless, the forecast for unemployment in 2024 is on average 0.4 percentage point lower than that in the April 2023 WEO, reflecting still-tight labor markets in a number of cases.

- In the *United States*, growth is projected at 2.1 percent in 2023 and 1.5 percent in 2024. The forecast is revised upward by 0.3 percentage point for 2023 and by 0.5 percentage point for 2024, compared with July 2023 WEO *Update* projections, owing to stronger business investment in the second quarter and resilient consumption growth, a reflection of a still-tight labor market. In addition, as already mentioned, the general government fiscal stance is expected to be expansionary in 2023. However, with wage growth slowing, savings accumulated during the pandemic running out, and the Federal Reserve maintaining tight monetary policy, growth is expected to slow in the second half of 2023 and in 2024. The unemployment rate is forecast to rise from 3.6 percent in the second quarter of 2023 to a peak of 4.0 percent by the last quarter of 2024—a lower peak than previously projected (5.2 percent in the April 2023 WEO and 5.6 percent at the time of the October 2022 WEO), consistent with a softer landing than earlier expected for the US economy.
- Growth in the *euro area* is projected to fall from 3.3 percent in 2022 to 0.7 percent in 2023, before

rising to 1.2 percent in 2024. The forecast is revised downward by 0.2 percentage point and 0.3 percentage point for 2023 and 2024, respectively, compared with July 2023 WEO *Update* projections. There is also a divergence in growth across major euro area economies in 2023. For *Germany*, where a slight economic contraction is now projected in the second half of 2023, amid weakness in interest-rate-sensitive sectors and slower trading-partner demand, there is a downward revision of 0.2 percentage point to growth of -0.5 percent. For *France*, where there was catch-up in industrial production and external demand outperformed in the first half of 2023, there is an upward 0.2 percentage point revision to growth of 1.0 percent.

- Among other major advanced economies, there is also some divergence in growth. Growth in the *United Kingdom* is projected to decline from 4.1 percent in 2022 to 0.5 percent in 2023, with a 0.1 percentage point upward revision. The decline in growth reflects tighter monetary policies to curb still-high inflation and lingering impacts of the terms-of-trade shock from high energy prices. In *Japan*, growth is projected to rise from 1.0 percent in 2022 to 2.0 percent in 2023, with a 0.6 percentage point upward revision, buoyed by pent-up demand, a surge in inbound tourism, and accommodative policies, as well as by a rebound in auto exports that had earlier been held back by supply chain issues.

Growth Forecast for Emerging Market and Developing Economies

For *emerging market and developing economies*, growth is projected to decline relatively modestly, from 4.1 percent in 2022 to 4.0 percent in both 2023 and 2024, with a downward revision of 0.1 percentage point for 2024 compared with the July 2023 WEO *Update* projection. However, this average path hides regional divergences, with growth in two of the five main geographic regions rising in 2023 and then falling in 2024.

- Growth in *emerging and developing Asia* is projected to rise from 4.5 percent in 2022 to 5.2 percent in 2023, then to decline to 4.8 percent in 2024, with downward revisions of 0.1 percentage point and 0.2 percentage point for 2023 and 2024, respectively, compared with July projections. The revision reflects a lower forecast for *China*, which is revised downward by 0.2 percentage point for 2023 and by 0.3 percentage point for 2024 to growth of 5.0 percent in 2023 and 4.2 percent in 2024. With the property market crisis in that country, lower investment is the main contributor to the revision. Growth in *India* is projected to remain strong, at 6.3 percent in both 2023 and 2024, with an upward revision of 0.2 percentage point for 2023, reflecting stronger-than-expected consumption during April-June.
- Growth in *emerging and developing Europe* is projected to rise to 2.4 percent in 2023, with an upward revision of 0.6 percentage point since July, before declining to 2.2 percent in 2024. The forecast for *Russia* is for a rise from -2.1 percent in 2022 to 2.2 percent in 2023, with an upward revision of 0.7 percentage point for 2023. The rise in growth reflects a substantial fiscal stimulus, strong investment, and resilient consumption in the context of a tight labor market. The upward revision for the region for 2023 also reflects an increase of 5.0 percentage points to the forecast for *Ukraine* to growth of 2.0 percent; the increase is due to stronger-than-expected domestic demand growth, with firms and households adapting to the war in that country amid sharply declining inflation and stable foreign exchange markets. It additionally reflects a 1.0 percentage point upside revision to growth of 4.0 percent in *Türkiye*, on the back of stronger-than-expected domestic demand.
- *Latin America and the Caribbean* is expected to see growth decline from 4.1 percent in 2022 to 2.3 percent in both 2023 and 2024, although with 0.4 percentage point and 0.1 percentage point upward revisions for 2023 and 2024, respectively, since July. The decline for 2023 reflects a normalization of growth along with the effect of tighter policies, a weaker external environment, and lower commodity prices. The upward revision to 2023 since July reflects stronger-than-expected growth in *Brazil*, revised upward by 1.0 percentage point to 3.1 percent, driven by buoyant agriculture and resilient services in the first half of 2023. Consumption has also remained strong, supported by fiscal stimulus. The upward revision for the region also reflects stronger-than-expected growth in *Mexico*, revised upward by 0.6 percentage point to 3.2 percent, with the delayed postpandemic recovery taking hold in construction and services and spillovers from resilient US demand.
- Growth in the *Middle East and Central Asia* is projected to decline from 5.6 percent in 2022 to 2.0 percent in 2023, before picking up to 3.4 percent in 2024, with a 0.5 percentage point downward revision for 2023 and a 0.2 percentage point upward revision for 2024. The change for 2023 is attributable mainly to a steeper-than-expected growth slowdown in *Saudi Arabia*, from 8.7 percent in 2022 to 0.8 percent in 2023, with a negative revision to the latter of 1.1 percentage point. The downgrade for growth in Saudi Arabia in 2023 reflects announced production cuts, including unilateral cuts and those in line with an agreement through OPEC+. Private investment, including that from “gigaproject” implementation, continues to support non-oil GDP growth, which remains strong and unchanged from previous projections. The downgrade for 2023 also reflects cuts to the growth forecast for Sudan to about -18.3 percent (a downward revision of nearly 20 percentage points) reflecting the outbreak of conflict, deteriorating domestic security, and the worsening humanitarian situation. The upgrade for 2024 reflects the unwinding of some of the announced production cuts.
- In *sub-Saharan Africa*, growth is projected to decline to 3.3 percent in 2023 before picking up to 4.0 percent in 2024, with 0.2 percentage point and 0.1 percentage point downward revisions for 2023 and 2024, respectively, and with growth remaining below the historical average of 4.8 percent. The projected decline reflects, in a number of cases, worsening weather shocks, the global slowdown, and domestic supply issues, including, notably, in the electricity sector. Growth in *Nigeria* is projected

to decline from 3.3 percent in 2022 to 2.9 percent in 2023 and 3.1 percent in 2024, with negative effects of high inflation on consumption taking hold. The forecast for 2023 is revised downward by 0.3 percentage point, reflecting weaker oil and gas production than expected, partially as a result of maintenance work. In *South Africa*, growth is expected to decline from 1.9 percent in 2022 to 0.9 percent in 2023, with the decline reflecting power shortages, although with a 0.6 percentage point upward revision thanks to the intensity of power shortages in the second quarter of 2023 being lower than expected.

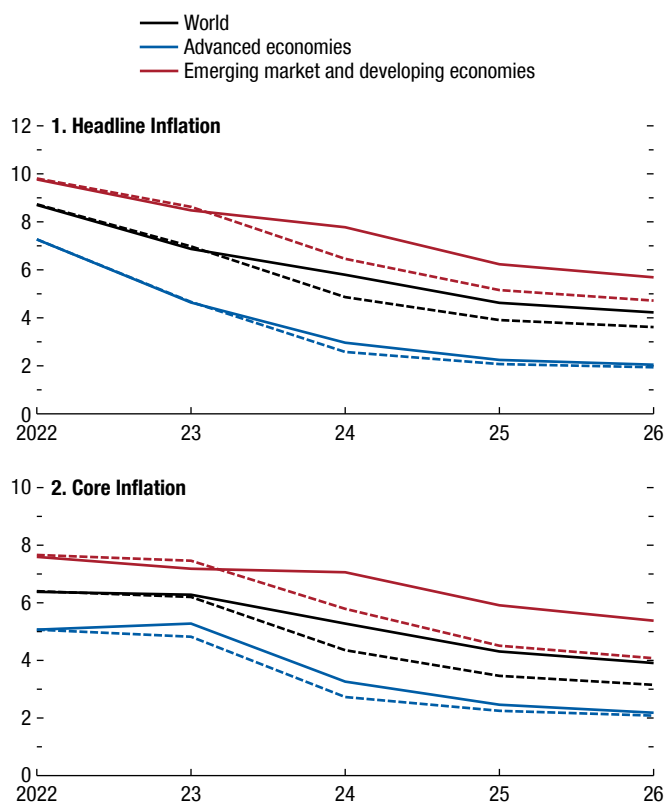
Inflation Outlook: Gradual Decline to Target

Global headline inflation is expected to steadily decline from its peak of 8.7 percent in 2022 (annual average) to 6.9 percent in 2023 and 5.8 percent in 2024 (Table 1.1). The forecast for 2024 is revised upward by 0.6 percentage point, reflecting higher-than-expected core inflation. On a year-over-year basis, projected global headline inflation peaked at 9.5 percent in the third quarter of 2022 and is projected to reach 5.9 percent by the fourth quarter of 2023 before falling to 4.8 percent in the fourth quarter of 2024, still above the prepandemic (2017–19) annual average of about 3.5 percent. Although monetary tightening is starting to bear fruit, a central driver of the fall in headline inflation projected for 2023 is declining international commodity prices.

Nearly three-quarters of economies are expected to see lower headline inflation in 2023, but the pace of disinflation is especially pronounced for *advanced economies* (Figure 1.18). These economies are expected to see (annual average) inflation fall by 2.7 percentage points in 2023, about double the (1.3 percentage point) decline projected for *emerging market and developing economies*. Part of this difference reflects advanced economies' benefiting from stronger monetary policy frameworks and communications, which facilitate disinflation (Chapter 2), but the difference also reflects lower exposure to shocks to commodity prices and exchange rates. In *low-income developing countries*, inflation is on average projected to be in double digits and is not expected to fall until 2024.

There are also large differences in the expected pace of change in headline inflation across major economies, as Figure 1.19 reports, reflecting different starting points. The *euro area* is expected to see an especially

Figure 1.18. Inflation Outlook: Falling
(Percent; dashes = April 2023)



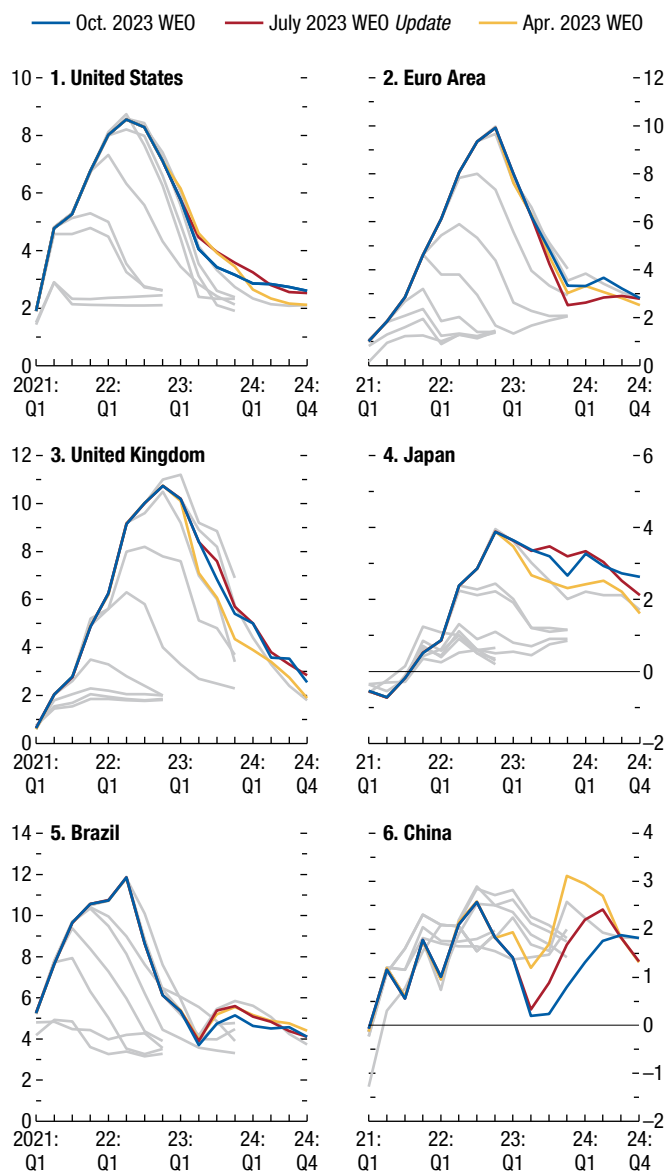
Source: IMF staff calculations.

Note: Solid lines denote inflation rates from the October 2023 WEO, and dashed lines denote inflation rates from the April 2023 WEO. Core inflation excludes volatile food and energy prices. WEO = World Economic Outlook.

sharp fall in (year-over-year) inflation in 2023—of 6.6 percentage points—from 9.9 percent in the fourth quarter of 2022 to 3.3 percent in the fourth quarter of 2023, with the fall reflecting in part the decrease in energy prices. In the *United States*, where inflation peaked earlier, the forecast is for a fall of 3.9 percentage points, from 7.1 percent in the fourth quarter of 2022 to 3.2 percent in the fourth quarter of 2023. In *China*, where inflation declined to near zero in the second quarter of 2023, a gradual rise—to still-low levels—is projected for the second half of 2023 as the drag from lower commodity prices wanes.

Core inflation is generally projected to decline more gradually than headline. Globally, it is set to decline modestly, from 6.4 percent in 2022 (annual average) to 6.3 percent in 2023 and 5.3 percent in 2024. It is proving more persistent than projected, with upward revisions of 0.3 percentage point and 0.6 percentage point for 2023 and 2024, respectively, compared

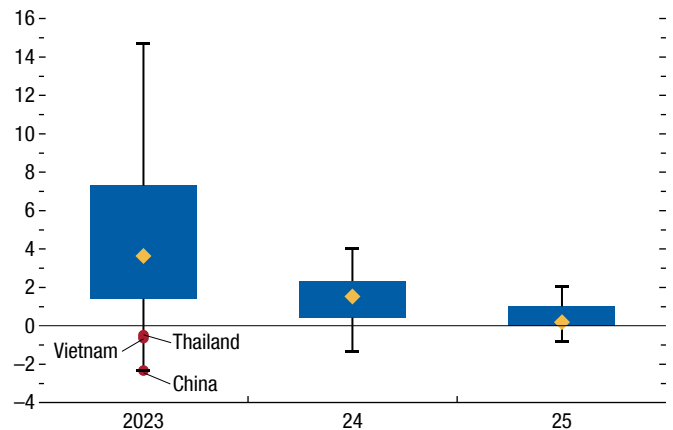
Figure 1.19. Headline Inflation Forecasts for Selected Economies
(Percent, year over year)



Source: IMF staff calculations.
Note: Gray lines sketch past WEO forecasts from January 2021 until January 2023 WEO Update. WEO = *World Economic Outlook*.

with the July 2023 WEO *Update* projections. The drivers of the upside revisions differ by economy but reflect, in several cases, still tight labor markets and stickier-than-expected services inflation, as well as, in some cases, including *Türkiye*, which accounts for the bulk of the global upside revision for 2024, the effects of past currency depreciations and the related pass-through into underlying inflation. On an annual average basis,

Figure 1.20. Inflation Mostly above Target until 2025
(Percentage points; distribution of deviation from inflation target)



Sources: Central bank websites; Haver Analytics; and IMF staff calculations.
Note: The figure shows the distribution (box-whisker plot) by each year. The diamonds in the middle of the boxes are the medians and the upper (lower) limits of the boxes are the third (first) quartile. The whiskers show the maximum and minimum within the boundary of 1.5 times the interquartile range from upper and lower quartiles, respectively.

over half of economies are expected to see no decline in core inflation in 2023. On a fourth-quarter-over-fourth-quarter basis, however, about 86 percent of economies (for which quarterly data are available) are projected to see a decline. Overall, returning inflation to target is expected to take until at least 2025 in most cases. Comparison of official inflation targets with the latest forecasts for 72 inflation-targeting economies (34 advanced economies and 38 major emerging market and developing economies) suggests that annual average inflation will exceed targets (or the midpoints of target ranges) in 93 percent of these economies in 2023 (Figure 1.20). Countries where inflation in 2023 is expected to average below target include China, Thailand, and Vietnam. In China, this projection reflects subdued core inflation in the context of substantial economic slack, with rising youth unemployment and pass-through from lower energy costs. In Thailand, this prospective outcome reflects strong pass-through from lower energy prices to core inflation as well as lower house price inflation. In Vietnam, it reflects a slowdown in economic activity and pass-through from lower energy prices. In 2024, inflation is still expected to exceed targets (or the midpoints of target ranges) in 89 percent of economies, with an expected median deviation of about 1 percentage point. By 2025, inflation is expected to be within only 0.2 percentage point of target (or the midpoints of target ranges) in most economies.

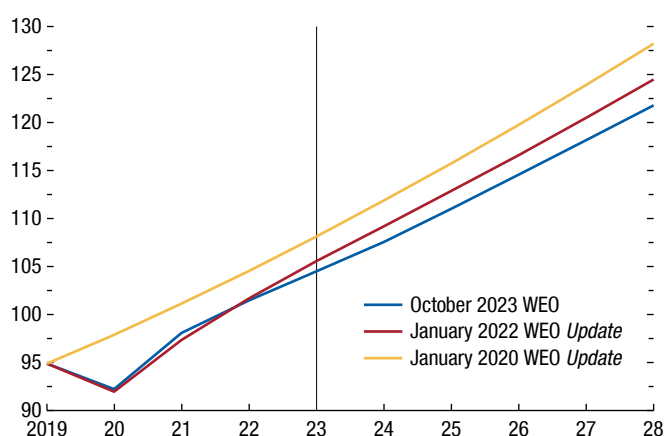
A Mediocre Medium Term

Forecasts for the growth rate of global GDP over the medium term are at their lowest in decades. As Box 1.1 explains, five-year-ahead forecasts for this rate from both the WEO and Consensus Economics—which summarizes the medium-term projections of leading forecasters for more than 100 economies—have declined over the past few decades. The latest WEO forecast for global growth in 2028 is 3.1 percent, as compared with a medium-term growth projection of 3.6 percent just before the onset of the pandemic (at the time of the January 2020 WEO *Update*) and 4.9 percent just before the onset of the global financial crisis (at the time of the April 2008 WEO). More than 80 percent of economies have seen a slowdown in their growth prospects from 15 years ago, at the time of the April 2008 WEO. Three-quarters of this reduction in global growth comes from weaker prospects for per capita GDP growth rather than merely slower population growth. A decomposition of the drivers of weaker per capita growth prospects points to slower prospective capital accumulation per worker and slower total factor productivity growth as the largest contributors. The slowdown in labor force participation in advanced economies also contributed about a third of the overall decline in projected per capita GDP growth, in the context of changing demographic trends because of population aging.

Prospects for income convergence across economies have also dimmed. At the time of the April 2008 WEO, poorer countries in terms of per capita income were expected to grow significantly faster than richer ones. But this growth differential has declined over the subsequent 15 years. As a result, the expected number of years needed for poorer countries to close half the gap in income per capita with richer countries has increased significantly since 15 years ago. Dimming global growth prospects imply fewer resources available to navigate a shock-prone world and attract needed investments.

Overall, based on current policies, a full recovery of global output to its prepandemic path is unlikely. Figure 1.21 reports the latest medium-term forecast for global GDP in trillions of dollars at 2023 prices. Even before Russia's invasion of Ukraine and the inflation surge of 2022, there was little prospect of returning to the prepandemic path (as reflected in the January 2020 forecasts), with expectations of longer-term scarring, particularly for emerging market and developing economies. Recovery to the prepandemic trend is now even more elusive. The latest projections for 2028

Figure 1.21. Forecasts of Global GDP
(Trillions of US dollars in 2023 prices)



Source: IMF staff calculations.

Note: For the January 2020 and January 2022 WEO *Updates*, calculations assume that growth rate projections for 2025 and 2027 represent, respectively, the longer-term growth rate projections (for years beyond 2025 and 2027, respectively). WEO = *World Economic Outlook*.

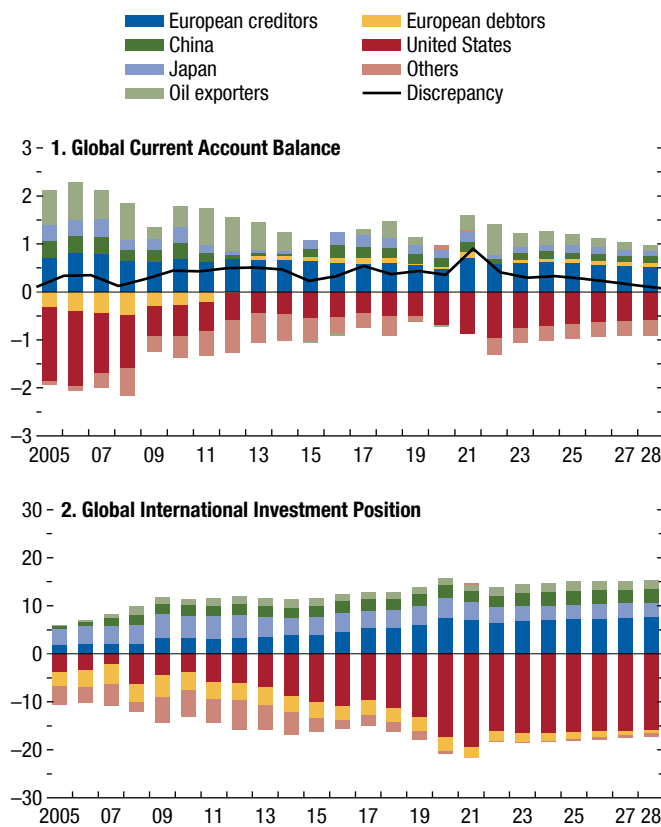
imply a global output loss of some 5.0 percent, with respect to prepandemic projections, or \$6.4 trillion at 2023 prices.

Trade Growth Historically Low

World trade growth is expected to decline from 5.1 percent in 2022 to 0.9 percent in 2023, before rising to 3.5 percent in 2024, well below the 2000–19 average of 4.9 percent. The projected decline in 2023 reflects not only the path of global demand, but also shifts in its composition toward domestic services; lagged effects of dollar appreciation, which slows trade owing to the widespread invoicing of products in dollars; and rising trade barriers. In 2022, countries imposed almost 3,000 new restrictions on trade, up from fewer than 1,000 in 2019.

Meanwhile, global current account balances—the sums of absolute surpluses and deficits—are expected to narrow in 2023, following their significant increase in 2022 (Figure 1.22). As reported in the IMF's 2023 *External Sector Report*, the rise in current account balances in 2022 reflected largely commodity price increases triggered by the war in Ukraine, which caused a widening in oil and other commodity trade balances. Over the medium term, global balances are expected to narrow gradually as commodity prices decline. Creditor and debtor stock positions reached historically elevated levels in 2022, with the increases

Figure 1.22. Current Account and International Investment Positions
(Percent of global GDP)



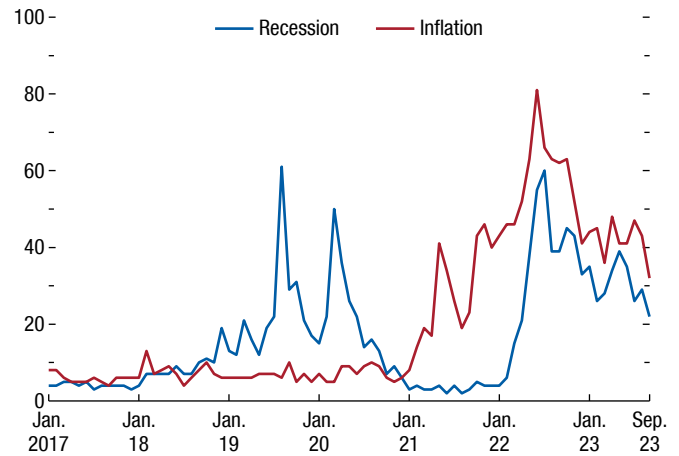
Source: IMF staff calculations.
Note: European creditors are Austria, Belgium, Denmark, Finland, Germany, Luxembourg, The Netherlands, Norway, Sweden, and Switzerland; European debtors are Cyprus, Greece, Ireland, Italy, Portugal, Slovenia, and Spain; oil exporters are Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, the Russian Federation, Saudi Arabia, the United Arab Emirates, and Venezuela.

reflecting mainly widening current account balances. They are expected to moderate slightly over the medium term as current account balances gradually narrow. In some economies, gross external liabilities remain large from a historical perspective and pose risks of external stress.

Risks to the Outlook: Tilted to the Downside but More Balanced

Adverse risks have receded since the April 2023 WEO, implying a more balanced distribution of risks around the outlook for global growth. Economic activity has proved more resilient than expected, and inflation is on a downward path, surprising on the downside in a number of cases. In addition, earlier this

Figure 1.23. Recession and Inflation Concerns over Time
(Index, 100 = highest point worldwide during 2008–23)



Source: Google Trends.
Note: Figure reports Google search interest in the topics *recession* and *inflation* relative to the highest point (100) during 2008–23 worldwide.

year, the resolution of US debt ceiling tensions and swift action by Swiss and US authorities to contain banking sector turbulence reduced the immediate risks of broader financial stress. Nevertheless, concerns regarding global inflation and recession remain high (Figure 1.23), reflecting the still-challenging environment, and the balance of risks to global growth remains tilted to the downside.

The most prominent risks and uncertainties surrounding the outlook are now discussed; a model-based analysis that quantifies risks to the global outlook and plausible scenarios follows in Box 1.2.

Upside Risks

More favorable outcomes for global growth than in the baseline forecast, which would strengthen the likelihood of a soft landing, are increasingly plausible:

- *Underlying inflation falls faster than expected.* Factors that could contribute to such an outcome include stronger-than-expected pass-through from lower energy prices or a compression of profit margins to absorb cost increases. Declining job vacancies could also play a stronger-than-expected role in easing labor markets, implying a downward shift in the ratio of vacancies to unemployment and reducing the need for further monetary tightening to curb inflation. As Box 1.2 explains, such developments would support economic growth by restoring purchasing power for households and allowing

central banks to bring forward an easing in their policy stances.

- *Domestic demand recovers faster.* In numerous economies, the stock of excess savings accumulated during the pandemic has not yet been drained and consumption remains below prepandemic trends, raising the possibility of a faster-than-expected consumption recovery. The US labor market could again prove tighter than expected, supporting a more resilient consumption path. Stronger policy support in China than currently envisaged—through means-tested transfers to households in particular—could bolster the recovery and generate positive global spillovers. Furthermore, as Box 1.2 explains, private investment could recover more strongly to prepandemic levels than currently expected in response to current policy initiatives. Recent breakthroughs in artificial intelligence and progress in green technologies could also usher in a new period of strong productivity growth, boosting investment and growth.

Downside Risks

Despite the recent favorable growth surprises, numerous adverse risks to global growth remain plausible:

- *China's economic growth slows further.* Recent developments shift the distribution of China's growth forecast risks to the downside, with negative implications for trading partners. The extent of the slowdown will depend largely on the Chinese government's policy response. To be effective, that response will have to preserve financial stability by expediting the restructuring of struggling property developers, facilitating the completion of housing projects, and addressing the growing strain in local government finances, all of which would help restore business and consumer confidence. Policy space has shrunk but is not fully exhausted. Given the lack of inflationary pressure, the People's Bank of China has some room to ease. At the same time, fiscal expenditures can be reoriented toward spending, with higher fiscal multipliers, keeping the overall fiscal stance broadly neutral. For instance, targeted support to households can be provided while shifting away from increasingly ineffective and expensive investment in infrastructure. In the most fiscally fragile provinces, financial stress in the real estate sector could end up spilling over to the rest of the financial sector via the sovereign-banking-corporate nexus

and contagion through nonbank financial intermediaries (see Chapter 1 of the October 2023 *Global Financial Stability Report*). Should concerns about financial stability in China fester, the impact could be felt in other emerging market economies through exchange rate volatility and destabilizing capital flows. Box 1.2 provides a quantification of the principal risks stemming from a deeper-than-expected contraction in the real estate sector in the absence of swift action to restructure property developers and unintended fiscal tightening in response to lower tax revenues for local governments.

- *Commodity prices become more volatile amid climate and geopolitical shocks.* Intense heat waves and droughts in the midst of record global temperatures this year have provided a taste of a more inhospitable future blighted by global climate change. More frequent crop failures across countries are likely, causing food price spikes and food insecurity. The ongoing El Niño phenomenon, which in the past typically has raised global food prices by more than 6 percent in a year (European Central Bank calculations as cited in Schnabel 2023), poses further risks. The war in Ukraine and geopolitical tensions elsewhere could intensify, triggering supply chain disruptions and renewed fluctuations in food, fuel, fertilizer, and other commodity prices. The suspension in July of the Black Sea Grain Initiative and recent attacks on Ukraine's grain facilities are concerns in this regard. In this context, a proliferation of export restrictions on agricultural products aimed at reducing domestic prices complicates the delivery of commodities to global markets, with the potential to exacerbate fluctuations in commodity prices. A rise in oil prices driven by a reduction in oil supply could reduce global economic activity and raise inflation, with the magnitude of the effects differing across regions.⁴ Moreover, as Chapter 3 explains, intensifying geo-economic fragmentation could constrain the flow of commodities across regions, causing additional price volatility. Commodities are particularly vulnerable to trade restrictions, as their production is highly concentrated as a result of natural endowments. Finally, shortages of energy resulting from lower investment in fossil fuel development that are not matched by

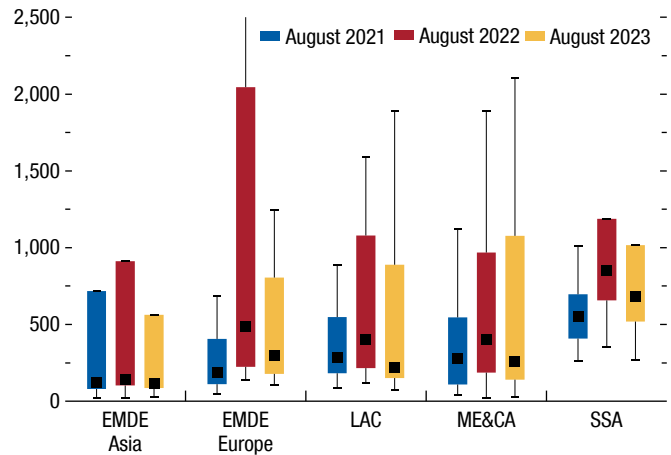
⁴As reported in Box 1.3 of the October 2022 WEO, a 30 percent rise in oil prices relative to baseline could reduce the level of global GDP by about 0.5 percent and raise global inflation by about 1.3 percentage points, relative to baseline. The analysis assumes monetary policy responds endogenously to movements in inflation.

corresponding increases in alternative clean energy supplies may cause more frequent energy crises. Such adverse supply shocks may affect countries asymmetrically, with particularly acute effects on lower-income countries, where food and energy constitute a large share of household consumption. Serious effects are especially likely in sub-Saharan Africa, where food averages about 40 percent of consumption.

- **Underlying inflation persists.** Tight labor markets and wage demands to compensate for past cost-of-living increases could contribute to persistent underlying inflationary pressures. In countries where companies' profit margins have grown in the past two years, there may be room to accommodate a rebound in real wages without triggering further price increases. With economic activity slowing, market pressures could contain the pass-through from labor costs to prices. However, as Chapter 2 explains, near-term inflation expectations remain elevated and above target inflation rates, which may contribute to more persistent wage and price pressures. This would complicate the task of monetary policy in restoring price stability. The ample stock of excess household savings in some economies could, where the surpluses are still sizable, slow the effects of monetary policy tightening on inflation. Greater-than-expected pressures on underlying inflation could then force central banks to—again—raise rates by more than expected.
- **Financial markets reprice.** Financial markets have adjusted upward their expectations in regard to monetary policy tightening in recent months, but new upside inflation surprises would force a monetary policy reassessment and could trigger a sudden rise in interest rate expectations and falling asset prices—as happened in March. Movements such as these could further tighten financial conditions and stress banks and nonbank financial institutions whose balance sheets remain vulnerable to interest rate risk, especially those highly exposed to commercial real estate. Contagion effects are possible. A flight to safety (Box 1.2), with an attendant appreciation of reserve currencies, would trigger negative ripple effects for global trade and growth and raise inflation in emerging market and developing economies, especially those highly dependent on imports of food and fuel.
- **Debt distress increases.** Global financial conditions, which measure the cost of funding in capital markets, have generally eased since the March 2023 banking stress episode, but lending standards have tightened and loan demand has declined in the United States,

Figure 1.24. Sovereign Spreads in Emerging Market and Developing Economies

(Basis points, distribution by economy group)



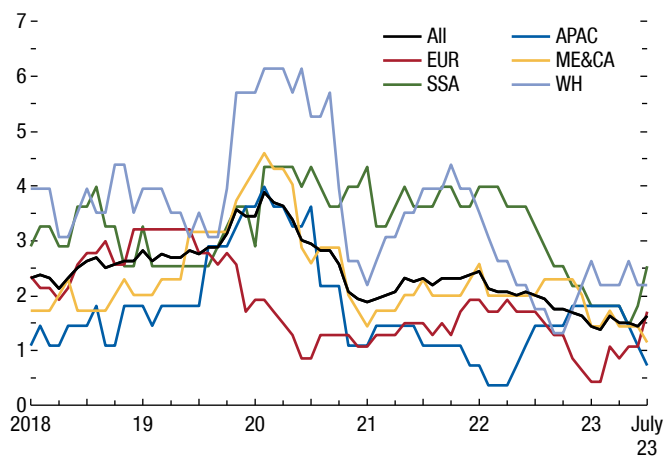
Sources: Bloomberg Finance L.P.; and IMF staff calculations.

Note: For each region, box denotes upper quartile, median, and lower quartile for members, and whiskers show maximum and minimum values within boundary of 1.5 times interquartile range from upper and lower quartiles. Y-axis is cut off at 2,500 basis points. EMDE = emerging market and developing economy; LAC = Latin America and the Caribbean; ME&CA = Middle East and Central Asia; SSA = sub-Saharan Africa.

the euro area, and some emerging market economies (see Chapter 1 of the October 2023 *Global Financial Stability Report*). Moreover, borrowing costs for emerging market and developing economies remain high, constraining priority spending and raising the risk of debt distress. The share of emerging market and developing economies with sovereign credit spreads above 1,000 basis points was 24 percent as of August: still much higher than two years ago (only 9.3 percent). For sub-Saharan Africa, spreads still exceed 680 basis points in more than half of cases (Figure 1.24). The share of low-income countries (56 percent) and emerging markets (25 percent) in or at high risk of debt distress this year remains elevated, as it was last year.

- **Geoeconomic fragmentation intensifies, hampering multilateral cooperation.** The ongoing separation of the world economy into blocs amid Russia's war in Ukraine and other geopolitical tensions could intensify—with more restrictions on trade (in particular, trade in strategic goods, such as critical minerals); cross-border movements of capital, technology, and workers; and international payments. Should this happen, the costs for global prosperity will be high. Over the long term, trade fragmentation alone—that is, the splintering of countries into

Figure 1.25. Social Unrest Stable at Low Level
(Percent of economies experiencing major social unrest)



Source: IMF staff calculations.

Note: The figure shows the fraction of countries within a world region experiencing major events of social unrest (including protests, riots, and major demonstrations) in the preceding 12 months. All = All economies; APAC = Asia-Pacific; EUR = Europe; ME&CA = Middle East and Central Asia; SSA = sub-Saharan Africa; WH = Western Hemisphere.

blocs that trade exclusively with one another—could reduce annual global GDP by up to 7 percent (Aiyar and others 2023). Intensification of geoeconomic fragmentation would also hamper multilateral cooperation in providing crucial public goods, such as fighting climate change and future pandemics and ensuring energy and food security.

- **Social unrest resumes.** Reports of social unrest—including protests, riots, and major demonstrations—have declined internationally since reaching elevated levels in late 2019 (Figure 1.25, which updates the index of Barrett and others 2022). However, a resumption of social turmoil, potentially as a result of future food and fuel price spikes, could hurt economic activity, particularly in countries with more limited scope to cushion the impact through policies (Hadzi-Vaskov, Pienknagura, and Ricci 2021). Social unrest could also complicate the passage and implementation of necessary reforms, including those relating to the energy transition.

Globally Consistent Risk Assessment of the World Economic Outlook Forecast

The risk of a hard landing has clearly receded since April, as the quantitative analysis in Box 1.2, based on the IMF's Group of Twenty (G20) Model, illustrates.

The estimated probability that global growth in 2023 will fall below 2.0 percent—an outcome that has occurred only five times since 1970—is now about 5 percent, down from an estimated 25 percent at the time of the April 2023 WEO. For 2024, the probability of such an outcome is about 15 percent, also down from about 25 percent at the time of the April 2023 WEO. A contraction in global per capita real GDP—which often happens when there is a global recession—in 2024 has an estimated probability below 10 percent. At the same time, the probability of global growth's exceeding 3.8 percent (the historical average during 2000–19) is also less than 20 percent for 2024, highlighting the relatively slow outlook for global growth. Turning to prices, the probability that core inflation in 2024 will be higher than in 2023, instead of declining to 5.3 percent from 6.3 percent in 2023, is assessed at about 15 percent.

Policy Priorities: From Disinflation to Sustained Growth

With inflation declining, policymakers are approaching the final stage of the inflation cycle that started in 2021. But despite the progress, persistent policy challenges remain. Underlying inflation is still too high in most countries and could easily persist, and budgetary space for needed investments is constrained in many cases, particularly in lower- and middle-income countries saddled with unsustainable debts. Putting a priority on supply-enhancing reforms that front-load gains and foster buy-in would narrow the large output losses projected under current policies, especially for emerging market and developing economies. Mitigating the negative effects of climate change and geoeconomic fragmentation and protecting the most vulnerable will require swift and internationally coordinated policy actions.

Policies with Near-Term Impact

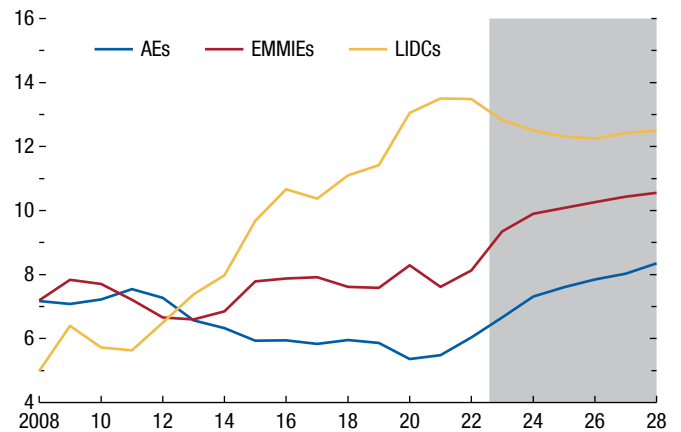
Durably restoring price stability: With global core inflation still high and declining slowly, central banks should generally maintain a tight stance and avoid prematurely easing monetary policy. At the same time, there are fewer cases in which sizable interest rate hikes are warranted, with increasing differentiation across countries' policy needs for ensuring price stability.

- **Returning inflation to target:** In economies in which inflation is still elevated and persistent, a restrictive stance—with real rates above neutral—is needed until

clear signs emerge that underlying inflation is durably cooling. This is critical to safeguarding the success of many central banks in keeping longer-term inflation expectations anchored. As Chapter 2 explains, strong monetary policy frameworks and effective communication are vital for minimizing the output costs of disinflation. Once underlying inflation is clearly cooling, with inflation and inflation expectations approaching the target, moving rates gradually to a more neutral policy stance may be warranted, while signaling continued commitment to price stability. For countries with inflation already below target, easing policies may be necessary to reduce the risks of inflation expectations de-anchoring.

- *Navigating uncertainty along the disinflation path:* The task for central banks is complicated by the difficulty of estimating with confidence levels of neutral rates of interest and of unemployment, as well as by lags in policy transmission (see Box 1.2 of the April 2023 WEO), uncertainties associated with forecasting inflation in this environment, and the differing potency of the transmission mechanism across economic sectors. Calibrating monetary policy will require weighing the costs of lowering nominal rates prematurely versus those of delaying too much.
- *Coordinating monetary and fiscal policies:* Although the primary responsibility for restoring price stability lies with central banks, legislated government spending cuts or tax increases aimed at ensuring public debt sustainability can, by reducing aggregate demand and reinforcing the overall credibility of disinflation strategies, further ease inflation. This is especially the case in countries with overheated economies and steep inflation-unemployment trade-offs. By the same token, in economies with inflation below target, fiscal expansion or a tilting of government spending toward items more supportive of demand, such as targeted household transfers, may be necessary, subject to available budgetary room for maneuver.
- *Monitoring financing conditions:* Financing conditions in capital markets have eased in the United States and the euro area (Adrian, Natalucci, and Wu 2023), which may complicate the task of fighting inflation. Careful monitoring of serious misalignment in financing conditions is warranted given the potential repercussions from a sudden repricing of risk. Central banks should be ready to deploy necessary financial stability tools to con-

Figure 1.26. General Government Interest Payments
(Percent of general government revenues)



Source: IMF staff calculations.

Note: AEs = advanced economies; EMMIEs = emerging market and middle-income economies; LIDCs = low-income developing countries.

tain signs of market strain (Adrian, Gopinath, and Gourinchas 2023).

Strengthening financial supervision and addressing stress: The fast pace of monetary policy tightening continues to put the financial sector under pressure. Strengthened supervision (through implementation of Basel III and removal of forbearance measures) and the monitoring of risks to anticipate further episodes of banking sector stress are warranted. The intensity of supervision should be commensurate with banks' risks and systemic importance, and it is essential to rapidly close oversight gaps in the nonbank financial sector. Macroprudential policy measures could be employed preemptively to tackle emerging risks in banks and nonbank financial institutions. Where market strains emerge, deploying tools that provide liquidity support promptly and forcefully, while mitigating the risk of moral hazard, would limit contagion. In China, where continued financial stress in the property sector presents a downside risk to global growth, stronger action by the central government is needed to avert macrofinancial feedback loops. This action should include further efforts to facilitate the exit of insolvent developers while protecting home buyers' interests, which would also help restore home buyer confidence. Countries at risk of external shocks can make full use of the global financial safety net afforded by international financial institutions, including IMF precautionary financial arrangements.

Normalizing fiscal policy: With fiscal deficits and government debt above prepandemic levels and debt-service costs as a share of GDP rising (Figure 1.26), tightening the fiscal stance is warranted in numerous cases to restore room for budgetary maneuver. In low-income and developing countries, interest payments constitute nearly one-eighth of general government revenues. For countries with limited fiscal space, shifting the composition of spending toward items that provide targeted support to households can support activity. Careful communication of medium-term fiscal policy plans is needed to support credibility and avert disruptive market responses. Where countries are in or at high risk of debt distress, achieving debt sustainability may require not only well-timed fiscal consolidation, but also debt restructuring (see Chapter 3 of the April 2023 WEO). Domestic revenue mobilization, more efficient spending, and improved institutional fiscal frameworks are increasingly pertinent for emerging market and developing economies given high debt levels and sizable spending needs.

Supporting the vulnerable: The composition of fiscal adjustment should protect the most vulnerable, by means of targeted support to households, among other methods, especially in the context of large swings in energy and food prices. Phasing out untargeted fiscal measures, especially those that blunt price signals—such as energy subsidies—is warranted as energy prices return to prepandemic levels.

Avoiding debt distress: Large short-term external financing needs are stretching the ability of numerous emerging market economies and low-income countries to service their debt. Sovereign spreads remain elevated, impeding access to credit for many economies reliant on short-term borrowing. Faster and more efficient coordination on debt resolution, through the G20 Common Framework and the Global Sovereign Debt Roundtable, among other options, would help mitigate the risk of debt distress spreading. The recent agreement between Zambia and its official creditor committee is a welcome step in that direction.

Improving food security: Extreme weather conditions—heat waves, floods, and wildfires—are exacerbating risks to the global supply of staple crops, including risks from the war in Ukraine, and threaten food security for millions of people. In this context, trade restrictions aimed at reducing domestic prices could worsen global food insecurity and create shortages for the world's poorest people. Bans on food exports should be lifted as soon as feasible to safeguard the global flow of food supplies.

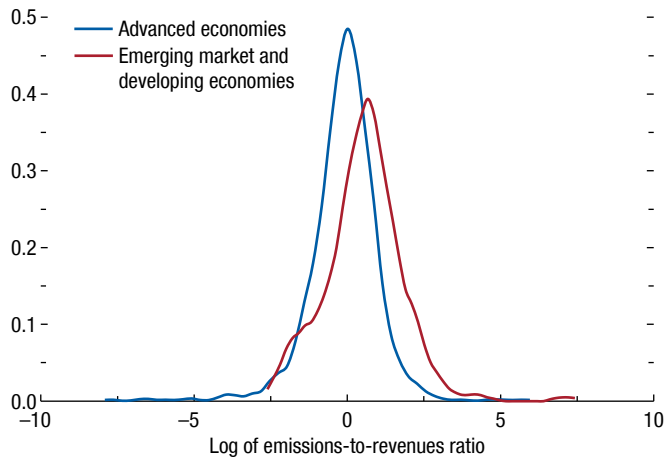
Strengthened multilateral cooperation on food security is needed, with strengthened rules-based frameworks for restrictions on food exports (see Chapter 3).

Enhancing labor supply: Reforms that reduce labor market tightness—by encouraging participation and reducing job search and job matching frictions—would facilitate fiscal consolidation and contribute gradually to easing inflation. Such reforms include short-term training programs for professions experiencing shortages and labor laws and regulations that increase work flexibility through telework and leave policies. Policies that encourage more women and older people to join the workforce, reduce labor market duality, and improve mobility would further enhance labor supply. Active immigration policies in advanced economies can address labor shortages as well as longer-term headwinds to growth, including those from population aging.

Policies with Medium-Term Payoffs

Intensifying macrostructural reforms: Targeted and carefully sequenced structural reforms can equip policymakers with additional levers to reinforce productivity growth despite constrained policy space. This is all the more important given the decline in medium-term growth prospects (Box 1.1). Making a priority of and bundling reforms that alleviate the most critical binding constraints to economic activity—such as governance, business regulation, and external sector reforms—can help front-load the resulting output gains, which helps ensure public buy-in. IMF staff analysis for emerging market and developing economies (Budina and others 2023) suggests that output gains from reforms can be substantial, even in the short term. In cases with large initial gaps in structural indicators relative to the best performance, a bundled and sequenced reform package is estimated to lift the level of output by 4 percent in two years and 8 percent in four years. Gains of this magnitude would significantly narrow the aforementioned output losses from the pandemic for these economies. More broadly, reforms ranging from enhancing human capital by expanding health care coverage and increasing access to early childhood and higher education, to reducing barriers to competition and supporting start-ups, to deepening digitalization would, depending on the economy in which they were enacted, enhance productivity. By accelerating growth, such reforms can also help assuage concerns about potential short-term growth costs of ambitious green reforms, including those that operate through energy

Figure 1.27. Firms Less Green in Emerging Market Economies
(Density)



Source: IMF staff calculations.

Note: The figure plots the kernel density of the log of the emissions-to-revenues ratio separately for firms headquartered in advanced economies and in emerging market and developing economies, after controlling for industry fixed effects (4-digit SIC). Data for 2019 are used, and finance, utilities, and energy sectors are excluded. The calculations are based on Capelle and others (forthcoming). SIC = Standard Industrial Classification.

prices (see Chapter 2 of the October 2022 WEO), and create the necessary fiscal space for implementation. In general, mitigating the potential adverse distributional effects of reforms across economic groups (including those relating to gender and age) requires complementary policies, including targeted support and regulations to ensure that the reform benefits are shared. Industrial policies could be pursued where externalities or market failures are well established and other policies are not available but should avoid protectionist provisions and be consistent with international agreements and World Trade Organization (WTO) rules.

Speeding the green transition and mitigating the effects of climate change: Reductions in global emissions are needed to mitigate climate change. Environmental performance varies widely across firms within industries (Figure 1.27). Laggards—firms with high emissions per unit of output relative to industry peers—operate older physical capital and are less knowledge-intensive and productive (Capelle and others, forthcoming). Significant emissions cuts could be achieved by helping these firms approach current technological frontiers. Carbon pricing and subsidies for green investments would support the adoption of frontier technologies, helping make production both greener and more efficient. Carbon border-adjustment

mechanisms can encourage trading partners to decarbonize and can ensure an equal footing for domestic producers and those in countries with less ambitious carbon-emissions-reduction targets, but they must be designed carefully to support consistency with WTO rules. Green industrial policies—currently pursued in China, the United States, and the European Union—complement carbon pricing to speed the transition. However, they also should be designed in a manner that avoids distortions to international trade (such as domestic-content provisions) and investment, also in line with WTO rules. In parallel, investments in climate adaptation activities and infrastructure are needed, especially for the regions most vulnerable to climate shocks. Enhancing climate-risk-monitoring systems and risk management frameworks and stronger safety nets and insurance are also needed to enhance climate resilience (October 2023 *Fiscal Monitor*).

Establishing a “green corridor” and increasing data sharing: A green corridor agreement is necessary to safeguard the international flow of critical minerals needed for the green transition. It should transcend geopolitical boundaries and be guided by the principles of common climate goals rather than beggar-thy-neighbor policies. Similar agreements could stabilize essential agricultural commodity markets by dampening supply volatility in the wake of adverse shocks. Prudent risk management also calls for investing in diversified supply sources to minimize the potential fallout in case of further fragmentation in commodity markets. A lack of data on critical minerals for the green transition raises uncertainty for producers and consumers and leads to price volatility. An international platform or organization could improve data sharing and standardization (see Chapter 3).

Strengthening multilateral cooperation and mitigating the effects of fragmentation: Multilateral cooperation is vital for achieving progress in dealing with the interlocking challenges holding back global recovery. Joint action is needed on many fronts, and further geo-economic fragmentation would trigger costly delays. Restoring trust in multilateral frameworks is urgently needed to revive a rules-based platform of international cooperation, to foster shared global prosperity, and to regulate potentially disruptive emerging technologies such as artificial intelligence. At the center of such reforms, enhancing trade policy certainty should be a priority. Necessary first steps should include restoring binding dispute settlement in the WTO and clarifying the application of key WTO rules to climate measures.

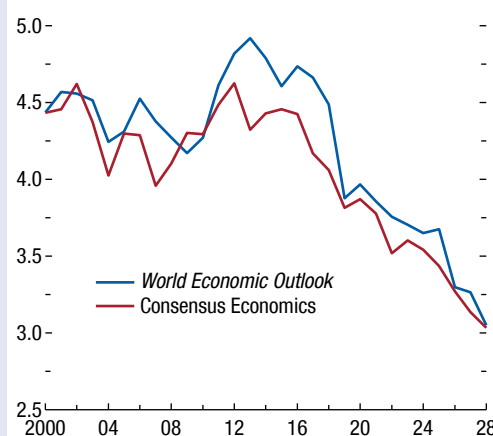
Box 1.1. Dimming Growth Prospects: A Longer Path to Convergence

Since the global financial crisis in 2008, forecasters have steadily diminished their expectations for growth over the medium term. Global five-year-ahead growth projections from the *World Economic Outlook* (WEO) have declined from a peak of 4.9 percent in the April 2008 WEO for growth in 2013 to 3.0 percent in the April 2023 WEO for growth in 2028: the lowest projection since 1990 (Figure 1.1.1). Forecasters at other institutions—as surveyed by Consensus Economics—have similarly reduced their expectations. If the focus is WEO forecasts, the decline in growth prospects started in the early 2000s for advanced economies, while emerging market and developing economies experienced a similar decline after the crisis. Of the 1.9 percentage point global decline in medium-term growth prospects from 2008 to 2023, advanced economies contributed 0.8 percentage point; emerging market and developing economies contributed 1.1 percentage points. Among emerging market and developing economies, low-income developing countries increased their contribution to projected global growth slightly during the same period (Figure 1.1.2). The world’s largest 10 economies, and 81 percent of all economies, have seen a decline in their medium-term growth prospects (Figure 1.1.3). The five largest emerging markets—Brazil, China, India, Indonesia, and Russia—have contributed about 0.9 percentage point to the decline in medium-term global growth prospects between 2008 and 2023. East Asia and the Pacific’s outlook has seen the largest downshift. The global medium-term outlook further declined after the shocks of 2020–22—including the COVID-19 pandemic and the Russian invasion of Ukraine—from 3.6 percent in the January 2020 WEO to 3.0 percent in the April 2023 WEO, with 52 percent of economies (all of them middle-income economies) seeing a decline.

A natural question is whether the decline in forecasters’ expectations for the global economy over the past 15 years has been excessively pessimistic, with outcomes likely to be better than expected. An examination of the bias in WEO forecast errors over time—the average difference between actual outcomes and forecasts—suggests that the answer is no. Forecasts were mostly aligned with growth outcomes during 1995–2008. After the global financial crisis, forecasts exhibited—if anything—some upward bias, with realized growth over the medium term falling short

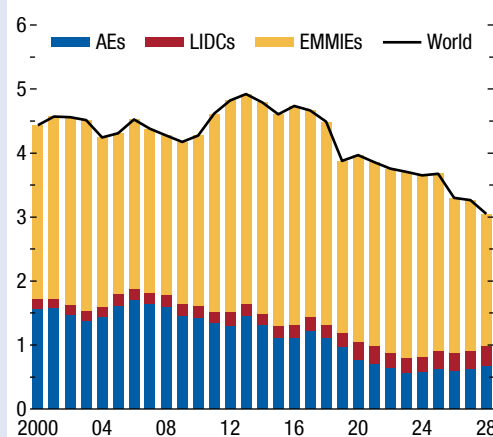
The authors of this box are Nan Li and Diaa Noureldin.

Figure 1.1.1. Five-Year-Ahead Growth Projections (Percent)



Sources: Consensus Economics; and 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* (WEO) five years prior, such that, for example, the 2028 forecast is based on the April 2023 WEO, and so on. The red line depicts the mean of the Consensus Economics forecasts.

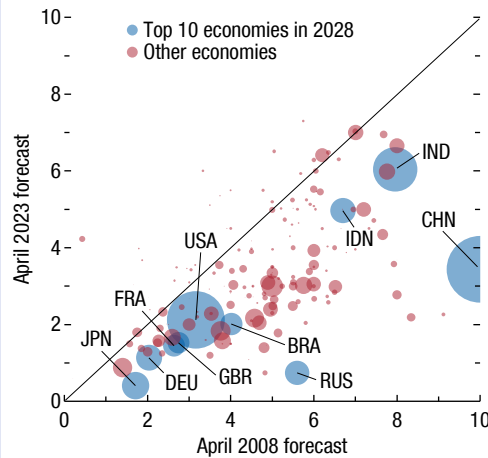
Figure 1.1.2. Five-Year-Ahead Growth Projections: Country Groups (Percent)



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* (WEO) five years prior, such that, for example, the 2028 forecast is based on the April 2023 WEO, and so on. AEs = advanced economies; EMMIEs = emerging market and middle-income economies; LIDCs = low-income developing countries.

Box 1.1 (continued)

Figure 1.1.3. Projected Growth Deceleration in the Largest Economies
(Five-year-ahead GDP growth, percent)



Source: IMF staff calculations.

Note: The predicted variable is real GDP growth. Bubble size indicates GDP in purchasing-power-parity international dollars for 2028. Data labels in the figure use International Organization for Standardization (ISO) country codes.

of medium-term predictions.¹ This suggests that the downward trajectory in the projections could in part reflect correcting for forecast optimism since the crisis.

A deeper look through forecasters' lenses sheds light on the factors driving the decline. First, three-quarters of the reduction in global growth prospects (about 1.4 percentage points) over the past 15 years has come from weaker per capita growth projections rather than merely slower population growth. Second, it is instructive to note that per capita growth can be decomposed into changes in capital per worker (or "capital deepening"), labor force participation, the employment rate (employment as a share of the labor force), and total factor productivity (TFP) (see Abiad and others 2009).²

¹The assessment is based on the regression $e_{i,t} = \alpha + \varepsilon_{i,t}$, in which $e_{i,t}$ is the growth forecast error, defined as the five-year end-of-period moving average of realized growth rates minus the five-year-ahead forecast, conducted as a vintage-by-vintage regression over the period 1990–2017, with the last vintage chosen to compare against the output realization for 2022. The results are robust to using actual growth rates instead of the moving average.

²The term capturing labor force participation also reflects changes in the share of the working age population in total population.

For advanced economies, the decline in per capita output growth in the recent forecasts relative to the forecasts for the early 2000s is attributed predominantly to lower TFP growth, followed by the decline in labor force participation and the slowdown in capital deepening (Figure 1.1.4). This reflects forecasters' views on future TFP growth, potentially due to unbalanced technological advances across sectors (Acemoglu, Autor, and Patterson 2023), frictions preventing efficient resource allocation (Baqaee and Farhi 2020), or diminishing returns to innovation (Bloom and others 2020). The projected decline in the contribution of labor force participation, which is broad-based across advanced economies, could reflect forecasters' views on the impact of population aging. The decline in the contribution of capital deepening could reflect views on declining investment prospects over time, partly on account of scarring effects on capital formation after the global financial crisis, and is most pronounced in regard to euro area economies.³ For emerging market and developing economies, the decline in TFP growth is also the largest contributor to the slowdown, explaining about 60 percent, followed by the decline in capital deepening. The projected decline in TFP growth in emerging market and developing economies could reflect fading effects of technological and educational improvement, the slowdown in reform momentum in the 2000s relative to the 1990s (October 2019 WEO), and rising fragmentation risks that would hurt growth in world trade and global value chains. The projected slowdown in capital deepening is also a significant contributor in some of the largest emerging market and developing economies—such as Brazil and Indonesia.⁴

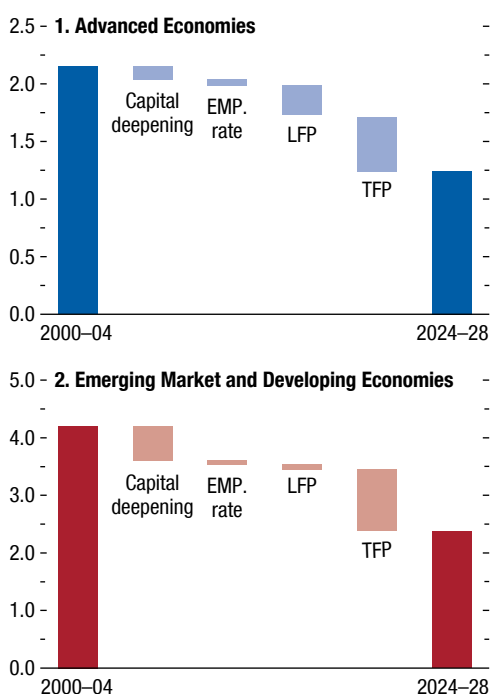
The decline in medium-term growth prospects, especially in emerging market and developing economies, has worrisome implications for the pace of convergence in living standards. Fifteen years ago,

³The scarring effects of the global financial crisis on investment are documented in the April 2015 *World Economic Outlook*. A potential explanation is the relatively larger fiscal consolidation in euro area economies after the crisis. This may have prompted expectations of a slower rate of capital accumulation, given evidence suggesting strong complementarity between public and private investment in European economies (Brasili and others 2023).

⁴These trends are generally consistent with estimates of potential output growth (see, for instance, Kilic Celik, Kose, and Ohnsorge 2023).

Box 1.1 (continued)

Figure 1.1.4. Per Capita Growth Forecast Decomposition (Percent)



Sources: Penn World Table version 10.01; and IMF staff calculations.

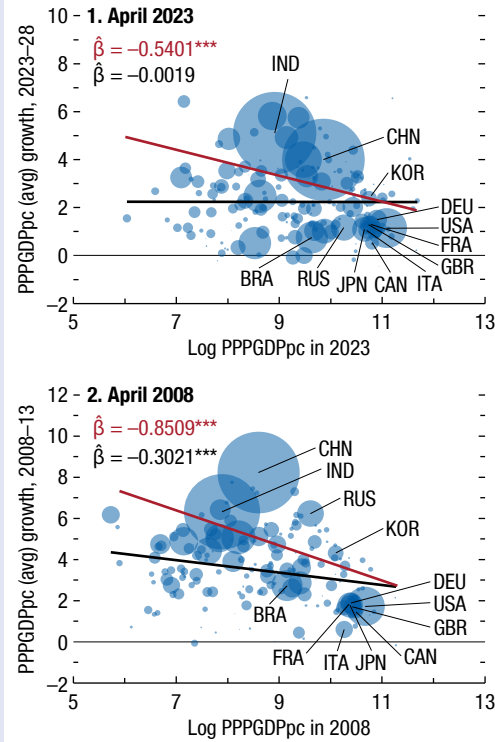
Note: The dark red and blue bars represent the period average of projected five-year-ahead per capita growth rates. The light red and blue bars represent the contributions, in percentage-point changes, to the total reduction in per capita growth between 2000–04 and 2024–28. The sample includes countries for which a full set of projections is available for all included variables and represents about 60 percent of world GDP at purchasing power parity in 2023. The *World Economic Outlook* (WEO) database includes forecasts for gross fixed capital formation, which were used to construct the capital stock, with historical depreciation rates taken from the Penn World Table (assumed constant from 2019 onward). The initial capital stock is estimated based on the respective capital-to-output ratios from the Penn World Table and assuming a capital share in output equal to 0.35. EMP. = employment; LFP = labor force participation; TFP = total factor productivity.

the five-year-ahead growth forecasts in the April 2008 WEO implied a positive and statistically significant rate of absolute convergence—with poorer countries growing unconditionally faster than rich countries by 0.9 percent annually. At this rate of convergence, economies’ progress in raising their living standards and the associated decline in the rate of change might have been expected to translate into a decline in global growth over time. Accordingly, IMF staff estimates suggest that up to 0.4 percentage point of the aforementioned decline in per capita global growth prospects since 2008 may reflect income convergence.⁵ In contrast, the five-year-ahead growth forecasts in the April 2023 WEO imply a convergence rate of only 0.5 percent a year, corresponding to the flatter relationship shown in Figure 1.1.5. These forecasts imply that the expected number of years needed for emerging market and developing economies to close half the gap in income per capita with advanced economies has significantly increased. For example, based on the population-weighted estimates in Figure 1.1.5, this half-life estimate has on average increased from 80 years for projections in the April 2008 WEO to about 130 years for projections in the April 2023 WEO. What is more, these estimates are population weighted, meaning that they give greater weight to more populous and faster-growing countries, such as China and India. Unweighted regressions—indicated in the figure by black lines—show even slower expected convergence rates that decline to near zero in the April 2023 WEO projections. Poorer countries have already suffered greater income losses during the recovery from the pandemic (Brussevich, Liu, and Papageorgiou 2022). The slower prospects for income convergence suggest a particularly difficult road ahead.

⁵The expected (absolute) convergence rate implied by projections in the April 2008 WEO is 0.3 percent when each country is treated as a unit of analysis and 0.9 percent when countries are weighted by population. Applying the 0.3–0.9 range of convergence rates to the level of initial GDP per capita across countries in 2008 implies a decline in global per capita GDP growth of 0.1–0.4 percentage point over 2008–23.

Box 1.1 (continued)

Figure 1.1.5. Medium-Term Growth and Income Convergence



Source: IMF staff calculations.
 Note: Absolute β convergence specification is $100 \times (\log(GDPpc_{i,t+5}) - \log(GDPpc_{i,t}))/5 = \alpha_{(i)} + \beta_{(i)} \log(GDPpc_{i,t}) + \epsilon_{(i,t)}$. Bubble size represents the population in year t . The red line represents population-weighted regression. On the vertical axis, the PPPGDPpc average growth is in percent. Data labels in the figure use International Organization for Standardization (ISO) country codes. PPPGDPpc = GDP per capita in purchasing-power-parity international dollars.

Box 1.2. Risk Assessment Surrounding the *World Economic Outlook's* Baseline Projections

The IMF's *Group of Twenty (G20) Model* is used in this box to derive confidence bands around the *World Economic Outlook (WEO)* forecast and to quantify alternative scenarios. Uncertainty about 2023 has narrowed considerably since the April 2023 WEO as the outturn for the first half of the year is now known. Beyond 2023, risks to growth are considered more balanced than in the April 2023 WEO but still tilted to the downside. The risk of global growth falling below 2 percent—an outcome that has occurred on only five occasions since 1970—in 2024 is assessed at about 15 percent, compared with 25 percent in April. The balance of risks for inflation beyond 2023 has shifted up, reflecting upward revisions to the baseline projection. The risk that core inflation in 2024 will be higher than in 2023 is assessed at about 15 percent. The scenarios assess several risks to the outlook. Upside risks include (1) greater-than-expected disinflation effects from fading supply disruptions and (2) a greater boost to global demand from a stronger recovery in investment in advanced economies. Downside risks include (1) further loss of growth momentum in China, (2) longer-than-expected transmission lags and larger effects from the ongoing global monetary tightening cycle, and (3) tighter financial conditions in emerging markets.

Confidence Bands

The methodology for producing confidence bands is based on Andrle and Hunt (2020) and was used in the October 2022 and April 2023 WEO reports. The G20 model, presented in Andrle and others (2015), is used to interpret historical data on output, inflation, and international commodity prices and to recover the implied economic shocks to aggregate demand and supply. The recovered shocks are sampled through non-parametric methods and fed back through the model to generate predictive distributions around the WEO projections. Distributions for global macro variables are then obtained by aggregating country-level estimates. There are two changes to the distributions for growth and inflation outcomes relative to April. First, shocks from 1982 were sampled more heavily in the previous WEO to stress the risk of a more pronounced slowdown from contractionary monetary policy. Here instead, shocks are sampled uniformly, consistent with risks to the outlook having become more balanced. While risks from monetary policy

The authors of this box are Jared Bebee, Harri Kemp, Pedro Rodriguez, and Rafael Portillo.

remain relevant for the current outlook, they are evaluated through a scenario instead of a shift in the predictive distribution. Second, the distribution for 2023 shocks has shrunk as the outturn for the first half of the year is already known.

Figure 1.2.1 (panels 1, 2, and 3) shows the distributions for global growth and inflation projections that result from the approach and assumptions just discussed. Each shade of blue represents a 5 percentage point interval, and the entire band covers 90 percent of the distribution. Regarding global growth, the range of possible outcomes has narrowed and shifted up relative to April. There is a 70 percent probability that global growth will be between 2.6 percent and 3.4 percent in 2023—a narrower range than in April—and a 70 percent probability that growth will be between 1.9 percent and 4.0 percent in 2024.

Regarding global inflation, uncertainty around 2023 has narrowed for both the headline and core figures: there is now a 70 percent probability that 2023 headline inflation could be about 0.7 percentage point higher or lower than currently projected, lower than the 1.2 percent band shown in April. Beyond 2023, risks have tilted up with the revision to the baseline: the probability that headline inflation in 2024 will be higher than in 2023 is assessed at 25 percent, compared with less than 10 percent in April. Similarly, the probability that core inflation in 2024 will be higher than in 2023 is assessed at 15 percent, compared with about 5 percent back in April.

Risk Scenarios

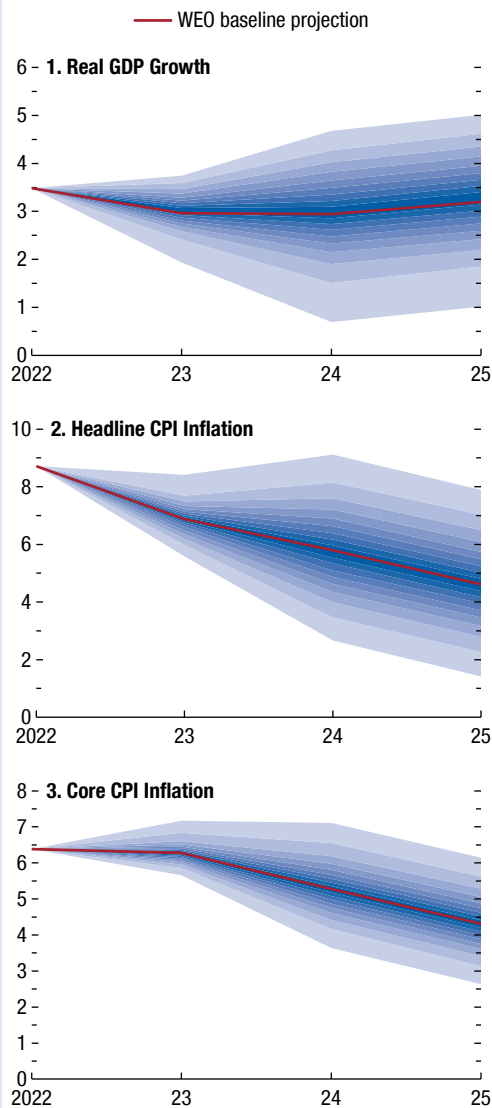
The April 2023 WEO presented a single large downside scenario for the world economy, centered around a large shock to credit supply. While financial risks remain, the probability of a severe scenario from banking sector developments has receded. Instead, this box quantifies several upside and downside risks. While each of the risks quantified here implies relatively moderate effects on global growth and inflation, several could materialize at the same time, in which case the global impact would be correspondingly larger. The scenarios assume that monetary policy and automatic fiscal stabilizers respond endogenously to macro developments, without additional policy support.

Upside Risks

Greater-than-expected global disinflation from further supply normalization: Supply constraints have been an important factor in the global inflation

Box 1.2 (continued)

Figure 1.2.1. Distribution of Forecast Uncertainty around Global GDP Growth and Inflation Projections
(Percent)



Source: IMF staff calculations.

Note: The figure shows the distribution of forecast uncertainty around the baseline projection as a fan. Each shade of blue represents a 5 percentage point probability interval. CPI = consumer price index; WEO = *World Economic Outlook*.

surge experienced during the pandemic recovery, both directly through higher goods inflation early on and indirectly by raising marginal costs. As multiple indicators point to normalization, fading supply disruptions are now helping with the ongoing disinflation. The scenario assumes that the global disinflation impulse is greater than in the baseline forecast, with the consumer price of manufactured goods relative to services—currently estimated to be 1 percent above the global aggregate trend prior to the COVID-19 pandemic—returning to trend over a two-year horizon. The additional impulse in the scenario is larger in countries, mainly advanced economies, that are starting from a higher relative goods price, with an impulse equal to –20 basis points of core inflation in 2023 and –50 basis points in 2024 (relative to baseline). For the remaining countries, except China, the impulse is two-thirds as large; China experiences a smaller shock. The lower-than-expected inflation raises purchasing power globally and allows central banks to lower rates at a more rapid pace over the scenario horizon, supporting global consumption, investment, and trade.

Stronger recovery in investment in advanced economies: Investment has been lagging since the COVID-19 crisis period ended, with global gross fixed capital formation remaining close to 10 percent below pre-pandemic trends. The scenario assumes investment grows by more than in the baseline over the next two years for several advanced economies, reflecting both (1) greater sensitivity to the expected recovery in some regions and sectors, and easing financial conditions, and (2) a stronger-than-expected boost from current policy packages (US Inflation Reduction Act, EU recovery fund). Higher investment supports global demand and trade but also adds to inflationary pressures, with the added assumption that Phillips curves are twice as sensitive to demand, as a result of the current inflation environment, which elicits a stronger policy response. However, the increase is modest in size: in the scenario, investment is 3 percent higher than the baseline by 2025 for the advanced economies group.

Downside Risks

Subdued confidence weighing on China's outlook: The scenario assumes a deeper-than-expected contraction in the real estate sector in the absence of swift action to restructure property developers, weaker consumption in the context of subdued confidence, and lack of meaningful policy support. As a result, China's private consumption and gross fixed capital

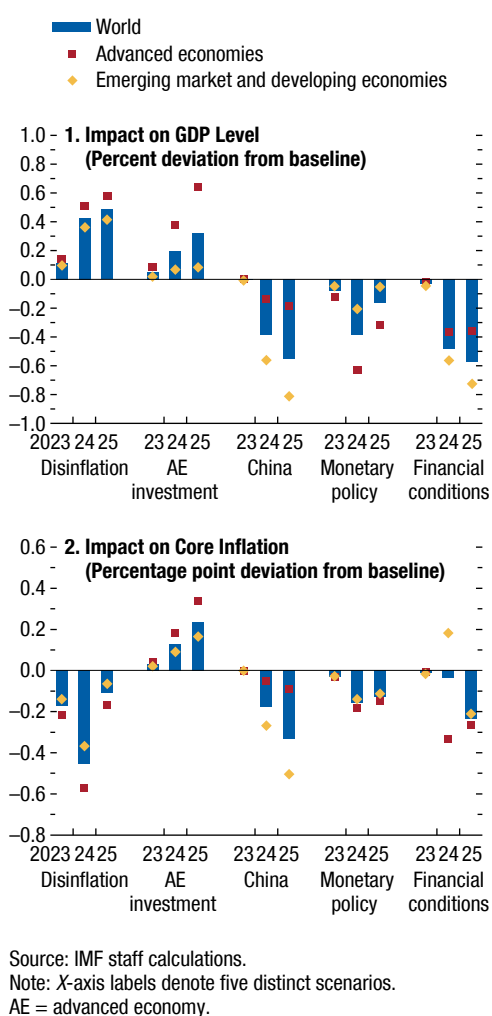
Box 1.2 (continued)

formation decline through 2025 by about –5 percent and –3.5 percent, relative to baseline. The shock fades beyond 2025.

Longer transmission lags and greater-than-expected effects from global monetary policy tightening: The relative resilience of the global economy in the first half of 2023 has raised the question of whether the full effect from the ongoing global monetary tightening is yet to be seen. The scenario assumes that the effects are larger than what is in the current WEO baseline, that the additional impulse in each country is proportional to the change in real rates since the beginning of the tightening cycle, and that the effects materialize by the end of 2023—and especially in 2024. The calibration draws on the uncertainty regarding transmission lags and magnitudes from different models and empirical estimates. Specifically, the shock is calibrated for the United States and the euro area by comparing the effects so far from the tightening, from the IMF’s G20 Model—which happen early in the tightening cycle and are smaller—with the effects from the FRB/US model and the structural vector autoregression (SVAR) model in Gertler and Karadi (2015) for the United States and ECB-Base model for the euro area, which take longer and are generally larger. The differences between the two sets of estimates are then fed into the G20 Model as shocks to aggregate demand, resulting in lower activity and inflation and a decrease in the policy rate relative to the baseline. For other G20 countries, the shock to aggregate demand is calculated as the average of the US and EU estimates (for each 1 percentage point increase in the real rate) multiplied by that country’s real rate increase. The estimated shocks to demand are largest in advanced economies (Australia, Canada, UK, US) and some emerging market economies (Brazil, Mexico).

Tighter financial conditions in emerging market economies: While the underlying cause is not included in the scenario, tighter financial conditions in emerging markets could result from a combination of higher-for-longer rates in advanced economies, especially the United States, and concerns about the implications for emerging market economies of lower growth in China. Following an incipient tightening toward the end of 2023, emerging market economies, excluding China, experience an increase in sovereign and corporate premiums of about 200 and 150 basis points, respectively, in the first half of 2024, relative to the baseline, with some of the tightening persisting

Figure 1.2.2. Impact of Scenario on GDP Level and Core Inflation



into the second half of 2024 and into 2025. Relatedly, currencies of emerging market economies see a depreciation of 10 percent relative to the US dollar in the first half of 2024, relative to the baseline.

Impact on World Output and Inflation

Figure 1.2.2 (panels 1 and 2) presents the effects from all four scenarios. Panel 1 shows the effects on GDP for the years 2023, 2024, and 2025, while panel 2 shows the effects for inflation over the same horizon. Effects on global GDP are presented as percent deviations from the baseline, while effects on global core inflation are presented as percentage point

Box 1.2 (continued)

deviations from the baseline.¹ Global aggregates are shown in bars, while aggregates for advanced economies and emerging markets are shown in red squares and yellow diamonds, respectively.

The scenarios highlight the broadly balanced nature of risks to the outlook:

- The disinflationary scenario generates a decrease in global core inflation that troughs at -0.4 percentage point in 2024 relative to the baseline, generating a 0.5 percent increase in global GDP in 2024, which persists into 2025. The effect is somewhat more pronounced in advanced economies; as a result, the latter group sees a decrease in policy rates of 0.3 percentage point, relative to the baseline.
- The scenario of stronger recovery in investment in advanced economies generates a modest increase in global output of up to 0.3 percent by 2025 and is associated with moderately higher inflation. The impact on GDP in advanced economies peaks at 0.6 percent in 2025, adding an additional 0.3 percentage point to core inflation and requiring an increase in policy rates of about 0.75 percentage point, relative to the baseline. Spillovers to emerging markets are small.

¹The impact on growth rates for a given year can be approximated by subtracting the effects on the level of output from the previous year.

- The downside scenario for China lowers its GDP by as much as -1.6 percent in 2025, with a decrease in core inflation of about 1 percentage point, relative to the baseline. There are spillovers to other countries, and the effect on global output is -0.6 percent by 2025.
- The scenario of longer monetary lags results in a decrease in global output of about -0.4 percent by 2024 and a modest decrease in global core inflation in that year (-0.1 percentage point). The effects are larger in advanced economies: -0.6 percent for output and -0.2 percentage point for core inflation. The main reason for the modest impact on inflation is that policy rates are lowered by 50 basis points in advanced economies in 2024 relative to the baseline, which helps soften the impact.
- Tighter financial conditions in emerging markets lower the level of global output by -0.5 percent by 2024. The effects are more pronounced in emerging market economies, but advanced economies are also negatively affected because of the loss of competitiveness. The inflation responses diverge across country groups initially—the disinflation is initially muted in emerging market economies, whose currencies depreciate, and is more pronounced in advanced economies, whose currencies appreciate—before converging in 2025.

Commodity Special Feature: Market Developments and the Commodity Price Channel of Monetary Policy

Primary commodity prices declined by 7.5 percent between February and August 2023. The widespread decline was led by base metals, with prices falling 15.7 percent, and European natural gas prices, plummeting 36.0 percent. The trend decline in cereal prices was temporarily halted by the collapse of the Black Sea Grain Initiative in July. Gold prices increased. This Special Feature analyzes the commodity price channel of monetary policy.

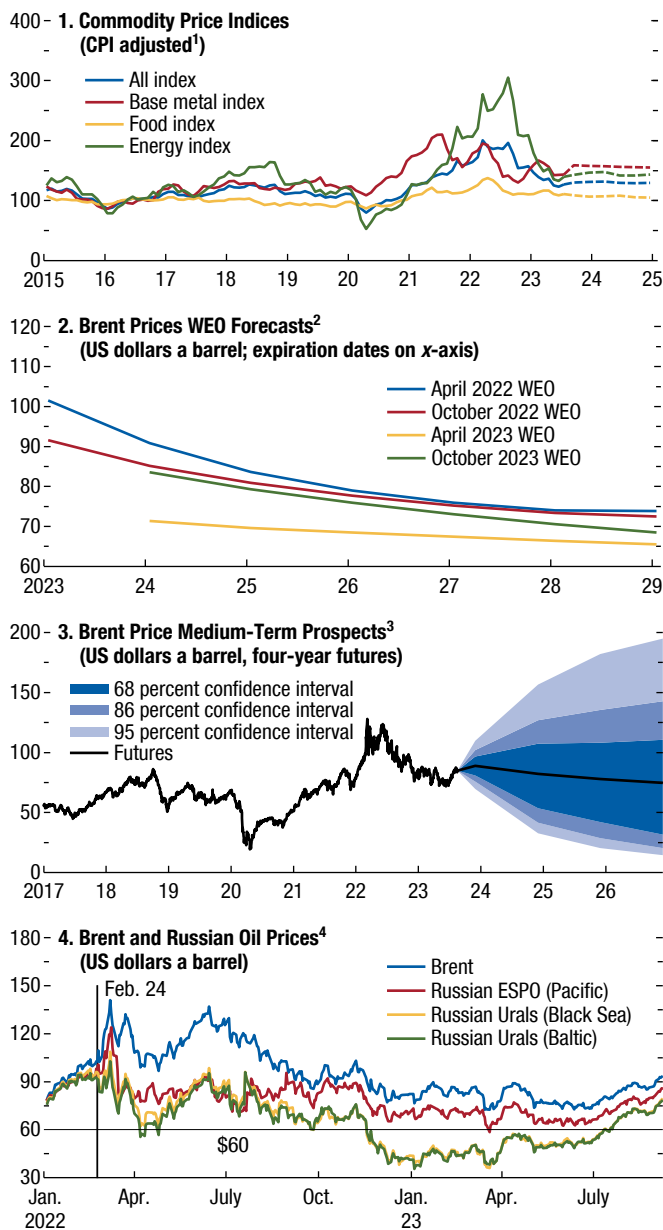
Commodity Market Developments

Supply curbs supporting oil prices. Thanks to a rebound in July and August, crude oil prices increased, by 4.4 percent, between February and August 2023, remaining, however, well below their peak of \$115 in June 2022 (Figure 1.SF.1, panels 1 and 3). On the demand side, a weaker-than-expected rebound in China’s oil consumption, temporary recession fears because of banking woes, and tighter monetary policy in many major economies all contributed to downward price pressures, especially in the second quarter of 2023.

On the supply side, output curbs by OPEC+ (Organization of the Petroleum Exporting Countries plus selected nonmember countries) of 1.2 million barrels a day (mb/d) announced in April—coupled with additional voluntary cuts of 1 mb/d and 0.3 mb/d by Saudi Arabia and Russia, respectively—were only partly offset by strong oil output growth in non-OPEC countries, most notably in the United States, where oil output is expected to increase by 1.1 mb/d this year. Western sanctions on Russian crude oil exports have had mixed effects: export flows of Russian oil have remained fairly steady, and its price discount relative to Brent oil has shrunk over time—Russian oil is trading above the \$60 price cap imposed by the Group of Seven (G7) countries—as the size of the non-Western-aligned oil tanker fleet carrying Russian oil has increased, and as Russia appears to have set up its own maritime insurance.

The contributors of this Special Feature are Christian Bogmans, Wenchuan Dong, Jorge Miranda-Pinto, Andrea Pescatori (Team Lead), Ervin Prifti, Martin Stuermer, and Guillermo Verduzco-Bustos with research assistance from Joseph Moussa and Tianchu Qi. This Special Feature is based on Miranda-Pinto and others (2023).

Figure 1.SF.1. Commodity Market Developments



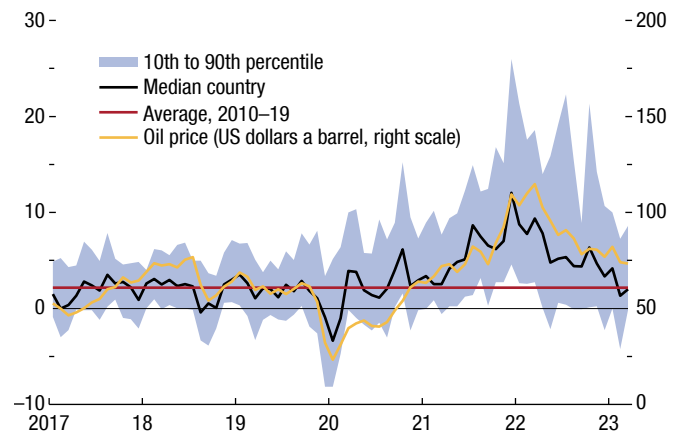
Sources: Argus; Bloomberg, L.P.; Haver Analytics; Refinitiv Datastream; IMF, Primary Commodity Price System; and IMF staff estimates.
¹US consumer price index adjusted. Last actual value is applied to the forecast.
²Forecasts based on *World Economic Outlook* (WEO).
³Derived from prices of futures options on August 18, 2023.
⁴Last data point is September 8, 2023. All prices are daily midpoints. ESPO = Eastern Siberia Pacific Ocean.

Futures markets suggest that crude oil prices will slide by 16.5 percent year over year to average \$80.5 a barrel in 2023 (from \$96.4 in 2022) and continue to fall in coming years, to \$72.7 in 2026 (Figure 1.SF.1, panel 2). The International Energy Agency expects oil demand to increase by 2.2 mb/d, reaching 102.2 mb/d in 2023, outstripping supply in the second half of the year. Uncertainty around this price outlook is elevated (Figure 1.SF.1, panel 3). Upside price risks stem from additional OPEC+ production cuts, a military escalation in the Black Sea, and insufficient investment in fossil fuel extraction. Downside price risks stem from a widespread global economic relapse, a slowdown in Chinese oil demand, and faster penetration of electric vehicles.

Natural gas prices continue to normalize. European Title Transfer Facility trading hub prices declined 36 percent from February to August 2023 to a monthly average of \$10.7 a million British thermal units (MMBtu) and within the upper range of historical prices. Lower demand, high storage overhang from this past winter, and ample supplies of liquefied natural gas (LNG) and of pipeline gas from Norway and northern Africa have all lowered prices. Asian LNG prices declined by 26.4 percent, roughly in lockstep with EU prices. US Henry Hub prices increased by 8.6 percent from February to average \$2.6/MMBtu in August 2023. The price differential between US and European gas is expected to slow gradually as US LNG export capacity expansion picks up in 2024 and beyond. This is reflected in a slowly narrowing gap between the US and EU futures price curves. Title Transfer Facility futures prices suggest that average annual prices could move from \$13.6/MMBtu to \$17.5/MMBtu in 2024 but then down to \$9.1/MMBtu by 2028. US Henry Hub prices are expected to rise from an annual average of \$2.7/MMBtu in 2023 to \$3.9/MMBtu in 2028.

Metal prices have weakened. After a short-lived rebound during the winter, base metal prices declined by 15.7 percent from February to August as China's reopening lost steam and its real estate sector, which together with construction accounts for roughly 20 percent of global metal consumption, kept faltering (Figure 1.SF.1, panel 1). Higher interest rates and weak European industrial demand also contributed to the negative market sentiment. Forecasts for base metal prices have also been revised downward since the April 2023 *World Economic Outlook*, with prices now projected to decline by 4.7 percent in 2023 and 7.1 percent in 2024. Gold prices remain high following a slowdown in the Federal

Figure 1.SF.2. Headline Inflation
(Month-over-month percent change, seasonally adjusted)



Sources: Haver Analytics; IMF, Primary Commodity Price System; and IMF staff calculations.
Note: Distribution (shaded area) covers countries accounting for 83.9 percent of *World Economic Outlook* World GDP (purchasing-power-parity-weighted).

Reserve's tightening pace and continued demand for inflation hedges and alternatives to the dollar.

Agricultural prices continue their downward trend. Between February and August, the IMF's food and beverage price index lost 6.7 percent, continuing its decline, though at a slower pace than in the second half of 2022. Prices of all major food commodities except sugar, rice, and pork contributed to the downward trend. As a result of a robust supply response in the 2022–23 season, grain prices fell consistently and in August stood 20.7 percent lower than in February. Grain prices remain, however, 7.7 percent above the average of the past five years. Food security concerns prompted recent export restrictions in India, the world's largest rice exporter. Risks to prices are tilted to the upside, stemming mostly from the ramifications of the end of the Black Sea Grain Initiative and uncertain effects of El Niño (see chapter text), possibly exacerbated by the proliferation of food export restrictions.

The Commodity Price Channel of Monetary Policy

Sharp fluctuations in commodity prices, among other factors, have been blamed for the recent global surge in inflation and for its subsequent fall (Figure 1.SF.2) (see, for example, Gagliardone and Gertler 2023; Blanchard and Bernanke 2023; and Ball, Leigh, and Mishra 2022). Commodity prices, however, are not exogenous with respect to the macroeconomy. Indeed,

part of the recent monetary policy reaction to inflation may have operated through a *commodity price channel*, as policy actions from major central banks affect global activity and financial conditions, which are typically major drivers of fluctuations in commodity prices. How quantitatively important is the commodity price channel of monetary policy—especially US monetary policy—in driving inflation in the United States and worldwide?

Empirical analysis of this question has been limited.¹ This Special Feature contributes to filling the gap by estimating the effects of US monetary policy shocks on commodity prices and, through this channel, their spillback to the US economy and spillovers to consumer prices in other countries. It also looks at pass-through from commodity prices to consumer prices and potential asymmetries.

A Conceptual Framework

Among central banks, the Federal Reserve plays a special role. This is because the bulk of cross-border capital flows are denominated in dollars, and US monetary policy is a key driver of the global financial cycle (Dées and Galesi 2021; Miranda-Agrippino and Rey 2020). Changes in US interest rates thus have pronounced repercussions for the rest of the world (Rey 2013).² Therefore, this analysis will focus on the effects of US monetary policy shocks (for an analysis of the effect of European Central Bank shocks, see Online Annex 1.1).³

Conceptually, US monetary policy can affect commodity prices through (1) a cost-of-carry channel, by affecting the opportunity cost of commodity

storage; (2) a real-economy channel, by affecting current and future commodity consumption; (3) a liquidity-and-portfolio channel, by affecting financial conditions and thus trading liquidity in physical and derivative markets; and (4) an exchange rate channel, as most commodities are traded in dollars. Since monetary policy typically has long lags affecting the real economy, an immediate effect of a monetary policy shock through the real-economy channel can work only through expectations and thus only for easy-to-store commodities.⁴

The Effects of Monetary Policy Shocks on Commodity Prices: A High-Frequency Approach

Local projections are used in the analysis presented here to estimate the effects of monetary policy shocks—as in Jarociński and Karadi (2020)—on commodity prices.⁵ The strongest impact is found for industrial metals (for example, nickel and copper) and oil. A 10 basis point monetary policy surprise leads to a 2.5 percent drop in the base metal price index and a 2 percent drop in oil prices, with the peak responses after about 20 days (see Figure 1.SF.3). Prices for raw materials, such as cotton and rubber, also have a similar decline, whereas the reaction of food prices, such as those for cereals, is smaller (less than 1 percent) and less precisely estimated.

Results are consistent with the cost-of-carry and real-economy channels, as higher interest rates increase the opportunity costs of holding inventories and, through the delayed effect on economic activity of higher funding costs, reduce future demand. These effects are more relevant for commodities with high storability (for example, base metals).⁶ The gold price reaction is very precisely estimated, with the price dropping by 1.1 percent after 23 days. For a given exchange rate, this sets a cap for the cost-of-carry channel, since gold prices are moved, during normal times,

¹Recent examples are Breitenlechner, Georgiadis, and Schumann (2022) and Ider and others (2023).

²The dollar is both an *intervention* currency and an *anchor* currency (Gourinchas 2019). This helps propagate US monetary policy impulses from the center to the periphery and provides a common component to the global monetary environment. The spillovers of US monetary policy to the rest of the world are further strengthened by the importance of dollar funding for global bank balance sheets, as well as the increasing length and complexity of global supply chains (Bruno and Shin 2015).

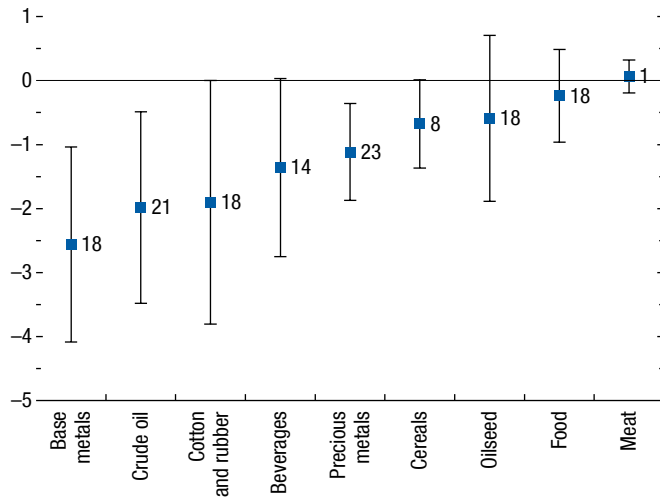
³Policy rate comovement among central banks is elevated. Moreover, US monetary policy shocks seem to lead to policy reactions and policy surprises from other central banks, such as the Bank of Canada and the European Central Bank (see Online Annex 1.1 for details). Kearns, Schrimpf, and Xia (2023) document that spillovers from other central banks are modest. In the case of China, typically it is fiscal policy that is more prevalently used for business cycle fluctuations rather than monetary policy. All online annexes are available at www.imf.org/en/Publications/WEO.

⁴Sizable monetary policy shocks can also have a nonlinear effect on commodity prices (Miao, Wu, and Funke 2011).

⁵Only dollar-denominated commodity prices are considered for 1990–2019. The *pure* monetary policy surprise from Jarociński and Karadi (2020), which does not consider central bank information effects, is used. More details are presented in Online Annex 1.1.

⁶The responses of natural gas prices (Henry Hub) are not considered, as gas markets present important structural changes throughout the sample. For the period 1990–2019, natural gas prices do not respond to US monetary policy. However, for the 2016–19 subsample only, when US natural gas exports increased dramatically, a significant decline in gas prices after US monetary policy tightening is observed.

Figure 1.SF.3. Peak Commodity Price Responses to a 10-Basis-Point US Monetary Policy Shock
(Percent change)



Sources: Bloomberg L.P.; IMF, Primary Commodity Price System; UN Comtrade; and IMF staff calculations.
Note: The numbers next to the boxes represent the horizon (day) of the maximum decline in commodity prices. 90 percent error bars are displayed.

mostly by the opportunity cost of storing gold.⁷ Monetary policy shocks also affect the dollar, which appreciates by 0.4 percent, but the impact is short-lived.⁸

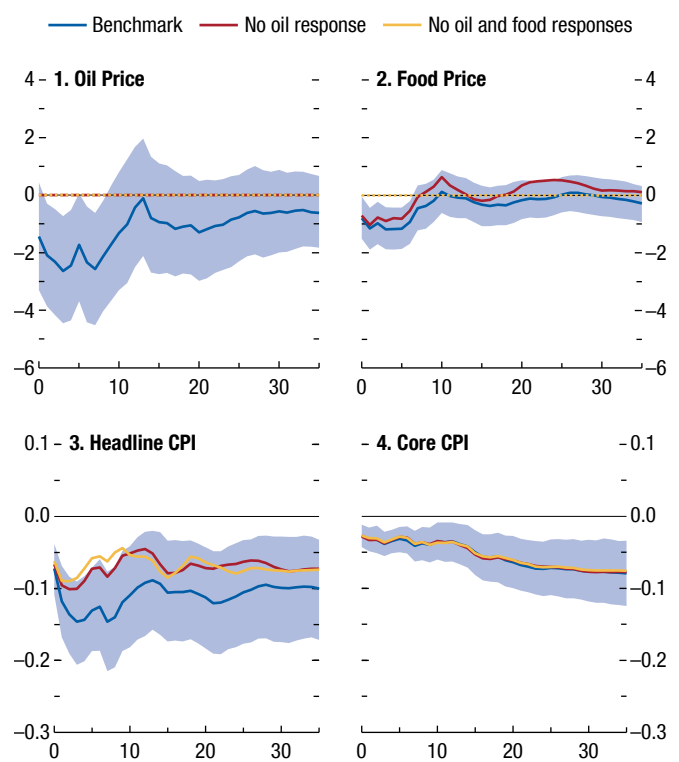
The Effects of Monetary Policy Shocks on Commodity Prices, Spillbacks, and Spillovers

Next, to gauge domestic spillbacks and spillovers from US monetary policy to other countries, a monthly proxy–structural vector autoregression approach is used. The analysis first looks at the effects of the commodity price channel on US inflation. It then moves on to the effects on other countries’ inflation. The focus is on prices of food and oil, which have the most direct effects on headline inflation.

⁷Except in the case of natural gas, the results are robust to choosing different subsample periods, suggesting that the relationship between monetary policy and commodity prices has not changed over time. This remains the case even if the sample is broken into segments before and after 2004, a year typically used to distinguish between periods before and after the financialization of commodity markets (Tang and Xiong 2012).

⁸This suggests that, conditional on a monetary policy shock, the correlation between the dollar and commodity prices is negative at high frequencies. Although there is evidence that the unconditional correlation between commodity prices and the dollar has changed since 2015 (Hofmann, Igan, and Rees 2023), the analysis presented in this Special Feature does not find evidence of a change in the relationship between US monetary policy and commodity price indices for that period (see Online Annex 1.1 for details).

Figure 1.SF.4. Impulse Response Functions for a 10-Basis-Point US Monetary Policy Shock
(Percent)



Sources: Bloomberg L.P.; Board of Governors of the Federal Reserve System; UN Comtrade; US Bureau of Labor Statistics; US Energy Information Administration; and IMF staff calculations.
Note: Red (yellow) lines show the response of the variables under the assumption that oil prices (oil and food prices) do not react. Blue areas are 68 percent confidence bands. Oil and food prices are expressed in current-year dollars. CPI = consumer price index.

The Spillbacks

A 10 basis point increase in the US federal funds rate induces a decline in oil prices of 2 percent on impact, and the effect persists for eight months. Food prices decline by 1 percent, and the effect is less persistent. The responses of the headline consumer price index (CPI), industrial production, and the exchange rate are in line with the textbook implications of a monetary policy tightening (see Figure 1.SF.4 and Online Annex 1.1).⁹

⁹In addition to the monetary policy instrument, the first specification considers seven macroeconomic variables: the one-year Treasury bill, US headline CPI, US core CPI, US industrial production, the excess bond premium, the US dollar, the West Texas Intermediate oil price, and a food price index. The data span 1990–2019. The focus on food and energy commodities is because their pass-through to headline inflation is more direct and less delayed than those of other commodities, such as metals, fertilizers, and raw materials.

Table 1.SF.1. Average Response of CPIs
(Percent)

		0–6 Months	0–12 Months	12–24 Months
United States	Benchmark	-0.12	-0.12	-0.02
	No oil	-0.09	-0.07	-0.02
	Contribution ¹	(32)	(40)	–
	No oil, no food	-0.07	-0.06	-0.01
	Contribution	(41)	(47)	–
	Contribution MA ²	(43)	(40)	–
Other Countries	Benchmark	-0.07	-0.07	0
	No oil	-0.04	-0.03	-0.01
	Contribution	(48)	(57)	–
	No oil, no food	-0.02	-0.02	0
	Contribution	(66)	(74)	–

Sources: Board of Governors of the Federal Reserve System; US Energy Information Administration; World Bank; and IMF staff calculations.

Note: Average response of CPIs to 10 basis point increase in interest rate. Time ranges in each column are average period of decline. CPI = consumer price index; MA = Mediation Analysis.

¹Percentages in parentheses are contributions of commodity channel.

²“Contribution MA” presents the contribution of the overall commodity index from instrumental variables local projection (IV-LP) mediation analysis (MA).

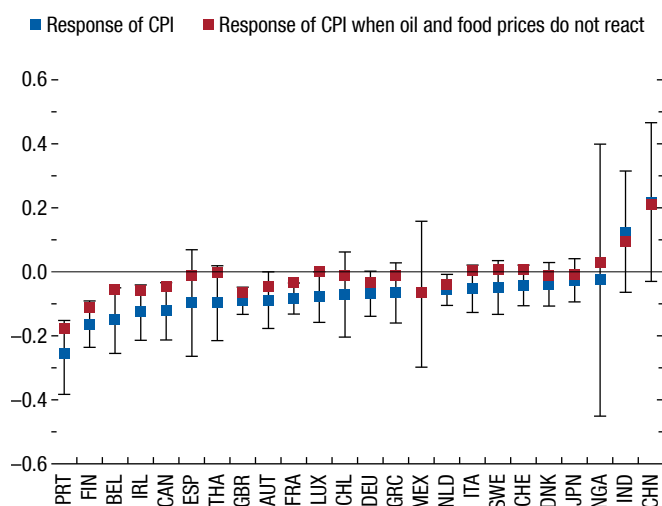
To isolate the commodity price channel of US monetary policy, in the spirit of Bernanke, Gertler, and Watson (1997), the impulse response functions are estimated again, with the condition imposed that US monetary policy has no effect on (1) oil prices and (2) both oil and food prices. If the commodity price channel is shut down, US monetary policy has smaller effects on the CPI. As Table 1.SF.1 shows, absent oil and food price responses, headline CPI would have declined by 0.07 percentage point rather than by 0.12 percentage point in the first half-year, implying a 41 percent contribution of the commodity price channel. The contribution is similar for the first year, but it declines over time as core inflation becomes the main driver (see Figure 1.SF.4, panel 4). Oil prices have a dominant role, since oil prices affect food prices but not vice versa.

An instrumental variable–local projection mediation analysis tends to confirm these results, with an average commodity price contribution of 43 percent over a half-year period (see Table 1.SF.1 and Online Annex 1.1).

The Spillovers

Figure 1.SF.5 reports the effects of US monetary policy on countries’ CPI (in blue), along with the effect of US monetary policy on countries’ CPI absent the commodity price channel (red).¹⁰ As expected,

¹⁰To study the effects of US monetary policy on foreign inflation through commodity prices, the previous specification is augmented with the CPI of country i and the bilateral exchange rate for country i and the United States, with the estimate repeated for a set of 24 countries. The same decomposition is performed to study how much of the change in country i ’s CPI is due to US monetary policy’s effect on commodity prices.

Figure 1.SF.5. Contribution of Oil and Food Prices in the Transmission of US Monetary Policy Shocks
(Percent)


Sources: Board of Governors of the Federal Reserve System; US Energy Information Administration; World Bank; and IMF staff calculations.

Note: Blue and red squares are the average one-year response of CPIs after an increase of 10 basis points in the US interest rate. Error bars are 68 percent confidence intervals. Data labels in the figure use International Organization for Standardization (ISO) country codes. CPI = consumer price index.

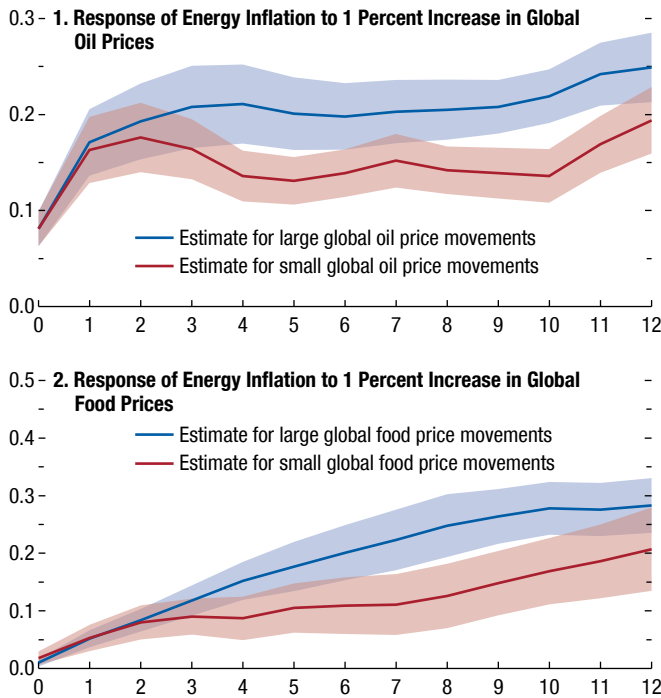
most countries’ CPIs decline after a US monetary policy tightening. The role of the commodity price channel is quantitatively important for several countries. As highlighted in Table 1.SF.1, for the average country, the commodity price channel accounts for 66 percent of the total spillover of US monetary policy onto inflation in the first half-year. The oil price alone contributes 48 percent.

Asymmetric Pass-Through

Some observers have suggested that in the most recent episode of heightened inflation, the pass-through from global commodity prices to domestic consumer prices increased. It has also been suggested that producers are eager to pass cost changes on to consumers when commodity prices are on the rise but refrain from doing so when commodity prices decline. Finally, producers may also pass a larger fraction of commodity price changes on to consumer prices when the changes to commodity prices are larger and happen more quickly, attracting the attention of producers by virtue of their salience.

A series of local projections of domestic food and energy inflation on food commodity price and oil price

Figure 1.SF.6. Asymmetric Pass-Through of Commodity Price Shocks
(Percent)



Sources: Ha, Kose, and Ohnsorge (2021); and IMF staff calculations.
Note: Shaded area is 90 percent confidence interval. Numbers on x-axis represent months after shock. Coefficient on large (small) price movements estimated on subsample of price changes larger than (smaller or equal to) one standard deviation.

shocks are conducted to test these hypotheses. For food inflation, there is no evidence that the pass-through is higher during commodity price booms than busts or that the pass-through for price increases is larger than that for price decreases. However, some evidence shows that the pass-through of large oil price shocks to domestic energy inflation could be twice the size of that for small ones (Figure 1.SF.6, panel 1). For food

inflation, there is also evidence that the food price pass-through is heightened for larger and thus more salient shocks (Figure 1.SF.6, panel 2).

Conclusions

Monetary policy has a strong direct effect on commodity prices, especially those of industrial and storable commodities such as oil and metals. Spillbacks and spillovers to other countries from US monetary policy shocks are fast. After a 10 basis point monetary policy shock, the decline in oil and food prices over the course of six months reduces both domestic and other countries' inflation by 0.05 percent on average. This result implies that the commodity price channel of US monetary policy has relatively larger spillovers to other countries than spillbacks to the United States. Whereas the commodity price channel accounts for 41 percent of the total decline in US headline CPI, it accounts for 66 percent of the total decline in headline CPI for the average country in the sample.

Spillovers from US monetary policy shocks tend to be more relevant for consumer prices in other advanced economies, whereas the reaction of consumer prices in emerging market economies and their commodity price channels are less precisely estimated, as emerging markets tend to have more regulated prices. There is no significant commodity price channel for core inflation. Major central banks, when setting policy objectives, should consider their spillbacks and spillovers through a commodity price channel and expect stronger pass-through during times of sharp commodity price changes (relative to times of small changes). Finally, as the Federal Reserve tends to set the tone for the global monetary policy stance, and given that other major central banks such as the European Central Bank can also affect commodity prices, the commodity price channel could be strengthened in periods of high monetary policy coordination.

Annex Table 1.1.1. European Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment
(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices ¹			Current Account Balance ²			Unemployment ³		
	2022	Projections		2022	Projections		2022	Projections		2022	Projections	
		2023	2024		2023	2024		2023	2024		2023	2024
Europe	2.7	1.2	1.5	15.4	10.5	9.4	2.0	2.0	2.1	...	...	...
Advanced Europe	3.5	0.7	1.2	8.5	5.9	3.3	1.9	2.5	2.6	6.0	6.0	6.0
Euro Area ^{4,5}	3.3	0.7	1.2	8.4	5.6	3.3	-0.7	1.2	1.4	6.7	6.6	6.5
Germany	1.8	-0.5	0.9	8.7	6.3	3.5	4.2	6.0	6.6	3.1	3.3	3.3
France	2.5	1.0	1.3	5.9	5.6	2.5	-2.0	-1.2	-1.3	7.3	7.4	7.3
Italy ⁶	3.7	0.7	0.7	8.7	6.0	2.6	-1.2	0.7	0.9	8.1	7.9	8.0
Spain	5.8	2.5	1.7	8.3	3.5	3.9	0.6	2.1	2.0	12.9	11.8	11.3
The Netherlands	4.3	0.6	1.1	11.6	4.0	4.2	9.2	7.6	7.6	3.5	3.7	4.1
Belgium	3.2	1.0	0.9	10.3	2.5	4.3	-3.6	-2.7	-1.9	5.6	5.7	5.7
Ireland	9.4	2.0	3.3	8.1	5.2	3.0	10.8	7.8	7.2	4.5	4.1	4.2
Austria	4.8	0.1	0.8	8.6	7.8	3.7	0.7	0.1	0.0	4.8	5.1	5.4
Portugal	6.7	2.3	1.5	8.1	5.3	3.4	-1.2	1.3	1.1	6.1	6.6	6.5
Greece	5.9	2.5	2.0	9.3	4.1	2.8	-10.1	-6.9	-6.0	12.4	10.8	9.3
Finland	1.6	-0.1	1.0	7.2	4.5	1.9	-3.6	-1.7	-0.9	6.8	7.3	7.4
Slovak Republic	1.7	1.3	2.5	12.1	10.9	4.8	-8.2	-2.7	-4.0	6.2	6.1	5.9
Croatia	6.2	2.7	2.6	10.7	8.6	4.2	-1.6	-0.2	-0.4	6.8	6.3	5.9
Lithuania	1.9	-0.2	2.7	18.9	9.3	3.9	-5.1	0.0	0.9	5.9	6.5	6.3
Slovenia	2.5	2.0	2.2	8.8	7.4	4.2	-1.0	4.4	3.8	4.0	3.6	3.8
Luxembourg	1.4	-0.4	1.5	8.1	3.2	3.3	3.6	3.7	4.0	4.8	5.2	5.8
Latvia	2.8	0.5	2.6	17.2	9.9	4.2	-4.7	-3.0	-2.4	6.9	6.7	6.6
Estonia	-0.5	-2.3	2.4	19.4	10.0	3.8	-2.9	1.8	2.6	5.6	6.7	7.1
Cyprus	5.6	2.2	2.7	8.1	3.5	2.4	-9.1	-8.6	-7.9	6.8	6.7	6.4
Malta	6.9	3.8	3.3	6.1	5.8	3.1	-5.7	-3.0	-2.9	2.9	3.1	3.2
United Kingdom ⁶	4.1	0.5	0.6	9.1	7.7	3.7	-3.8	-3.7	-3.7	3.7	4.2	4.6
Switzerland	2.7	0.9	1.8	2.8	2.2	2.0	10.2	8.0	8.0	2.2	2.1	2.3
Sweden	2.8	-0.7	0.6	8.1	6.9	3.6	4.8	5.4	5.4	7.5	7.5	8.1
Czech Republic	2.3	0.2	2.3	15.1	10.9	4.6	-6.1	0.5	1.7	2.1	2.8	2.6
Norway	3.3	2.3	1.5	5.8	5.8	3.7	30.2	26.2	25.4	3.3	3.6	3.8
Denmark	2.7	1.7	1.4	8.5	4.2	2.8	13.5	11.4	9.9	4.5	5.0	5.0
Iceland	7.2	3.3	1.7	8.3	8.6	4.5	-2.0	-0.6	-0.4	3.8	3.4	3.8
Andorra	8.8	2.1	1.5	6.2	5.2	3.5	17.0	17.9	18.4	2.1	1.9	1.7
San Marino	5.0	2.2	1.3	5.3	5.9	2.5	8.0	3.8	2.9	4.3	4.0	3.9
Emerging and Developing Europe⁷	0.8	2.4	2.2	27.9	18.9	19.9	2.6	-0.4	-0.3	...	...	...
Russia	-2.1	2.2	1.1	13.8	5.3	6.3	10.5	3.4	4.0	3.9	3.3	3.1
Türkiye ⁶	5.5	4.0	3.0	72.3	51.2	62.5	-5.3	-4.2	-3.0	10.3	9.9	10.1
Poland	5.1	0.6	2.3	14.4	12.0	6.4	-3.0	1.0	0.3	2.9	2.8	2.9
Romania	4.7	2.2	3.8	13.8	10.7	5.8	-9.3	-7.3	-7.1	5.6	5.6	5.4
Ukraine ⁶	-29.1	2.0	3.2	20.2	17.7	13.0	5.0	-5.7	-7.2	24.5	19.4	10.6
Hungary	4.6	-0.3	3.1	14.5	17.7	6.6	-8.0	-0.9	-1.6	3.6	3.9	3.8
Belarus	-3.7	1.6	1.3	15.2	4.7	5.7	3.7	2.7	2.0	4.2	4.0	3.6
Bulgaria	3.4	1.7	3.2	13.0	8.5	3.0	-0.7	0.0	0.1	4.2	4.6	4.4
Serbia	2.3	2.0	3.0	12.0	12.4	5.3	-6.9	-2.3	-3.2	9.4	9.1	9.0

Source: IMF staff estimates.

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

¹Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.²Percent of GDP.³Percent. National definitions of unemployment may differ.⁴Current account position corrected for reporting discrepancies in intra-area transactions.⁵Based on Eurostat's harmonized index of consumer prices, except in the case of Slovenia.⁶See the country-specific notes for Italy, Türkiye, Ukraine, and the United Kingdom in the "Country Notes" section of the Statistical Appendix.⁷Includes Albania, Bosnia and Herzegovina, Kosovo, Moldova, Montenegro, and North Macedonia.

Annex Table 1.1.2. Asian and Pacific Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment
(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices ¹			Current Account Balance ²			Unemployment ³		
	2022	Projections		2022	Projections		2022	Projections		2022	Projections	
		2023	2024		2023	2024		2023	2024		2023	2024
Asia	3.9	4.6	4.2	3.8	2.8	2.7	1.8	1.6	1.5	...	...	...
Advanced Asia	1.8	2.1	1.8	3.8	3.5	2.7	3.6	3.8	3.9	2.9	2.8	2.9
Japan	1.0	2.0	1.0	2.5	3.2	2.9	2.1	3.3	3.7	2.6	2.5	2.3
Korea	2.6	1.4	2.2	5.1	3.4	2.3	1.8	1.3	1.7	2.9	2.7	3.2
Taiwan Province of China	2.4	0.8	3.0	2.9	2.1	1.5	13.3	11.8	12.1	3.7	3.7	3.7
Australia	3.7	1.8	1.2	6.6	5.8	4.0	1.1	0.6	-0.7	3.7	3.7	4.3
Singapore	3.6	1.0	2.1	6.1	5.5	3.5	19.3	16.6	15.2	2.1	1.8	1.8
Hong Kong SAR	-3.5	4.4	2.9	1.9	2.2	2.3	10.6	7.1	6.3	4.3	3.2	3.1
New Zealand	2.7	1.1	1.0	7.2	4.9	2.7	-9.0	-7.9	-6.5	3.3	3.8	4.9
Macao SAR	-26.8	74.4	27.2	1.0	0.9	1.7	-23.5	19.9	32.4	3.0	2.7	2.5
Emerging and Developing Asia	4.5	5.2	4.8	3.8	2.6	2.7	1.2	0.7	0.6	...	...	...
China	3.0	5.0	4.2	1.9	0.7	1.7	2.2	1.5	1.4	5.5	5.3	5.2
India ⁴	7.2	6.3	6.3	6.7	5.5	4.6	-2.0	-1.8	-1.8	...	...	...
Indonesia	5.3	5.0	5.0	4.2	3.6	2.5	1.0	-0.3	-0.6	5.9	5.3	5.2
Thailand	2.6	2.7	3.2	6.1	1.5	1.6	-3.0	-0.2	1.9	1.3	1.2	1.1
Vietnam	8.0	4.7	5.8	3.2	3.4	3.4	-0.3	0.2	0.7	2.3	2.1	2.1
Philippines	7.6	5.3	5.9	5.8	5.8	3.2	-4.5	-3.0	-2.6	5.4	4.7	5.1
Malaysia	8.7	4.0	4.3	3.4	2.9	2.7	3.1	2.7	2.8	3.8	3.6	3.5
Other Emerging and Developing Asia⁵	3.9	3.8	5.6	12.3	10.8	7.4	-3.8	-1.2	-1.2	...	...	...
<i>Memorandum</i>												
ASEAN-5 ⁶	5.5	4.2	4.5	4.8	3.6	2.5	2.7	2.3	2.3	...	...	...
Emerging Asia ⁷	4.5	5.2	4.8	3.4	2.3	2.5	1.3	0.8	0.7	...	...	...

Source: IMF staff estimates.

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

¹Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.²Percent of GDP.³Percent. National definitions of unemployment may differ.⁴See the country-specific note for India in the "Country Notes" section of the Statistical Appendix.⁵Other Emerging and Developing Asia comprises Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Fiji, Kiribati, Lao P.D.R., Maldives, the Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, Palau, Papua New Guinea, Samoa, the Solomon Islands, Sri Lanka, Timor-Leste, Tonga, Tuvalu, and Vanuatu.⁶Indonesia, Malaysia, the Philippines, Singapore, and Thailand.⁷Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

Annex Table 1.1.3. Western Hemisphere Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment
(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices ¹			Current Account Balance ²			Unemployment ³		
	2022	Projections		2022	Projections		2022	Projections		2022	Projections	
		2023	2024		2023	2024		2023	2024		2023	2024
North America	2.3	2.1	1.5	7.9	4.2	2.8	-3.4	-2.7	-2.6	...	...	...
United States	2.1	2.1	1.5	8.0	4.1	2.8	-3.8	-3.0	-2.8	3.6	3.6	3.8
Mexico	3.9	3.2	2.1	7.9	5.5	3.8	-1.2	-1.5	-1.4	3.3	2.9	3.1
Canada	3.4	1.3	1.6	6.8	3.6	2.4	-0.3	-1.0	-1.0	5.3	5.5	6.3
Puerto Rico ⁴	2.0	-0.7	-0.2	5.9	2.9	1.5	...	...	...	6.2	6.8	6.6
South America⁵	3.8	1.6	2.0	17.4	18.7	14.7	-3.0	-1.9	-1.6	...	...	...
Brazil	2.9	3.1	1.5	9.3	4.7	4.5	-2.8	-1.9	-1.8	9.3	8.3	8.2
Argentina	5.0	-2.5	2.8	72.4	121.7	93.7	-0.7	-0.6	1.2	6.8	7.4	7.2
Colombia	7.3	1.4	2.0	10.2	11.4	5.2	-6.2	-4.9	-4.3	11.2	10.8	10.4
Chile	2.4	-0.5	1.6	11.6	7.8	3.6	-9.0	-3.5	-3.6	7.9	8.8	9.0
Peru	2.7	1.1	2.7	7.9	6.5	2.9	-4.1	-1.9	-2.1	7.8	7.6	7.4
Ecuador	2.9	1.4	1.8	3.5	2.3	1.8	2.4	1.5	1.6	3.2	3.8	3.9
Venezuela	8.0	4.0	4.5	186.5	360.0	200.0	3.6	2.2	3.4	...	...	...
Bolivia	3.5	1.8	1.8	1.7	3.0	4.4	-0.4	-2.7	-3.3	4.7	4.9	5.0
Paraguay	0.1	4.5	3.8	9.8	4.7	4.1	-6.0	0.6	0.1	6.8	6.2	6.0
Uruguay	4.9	1.0	3.2	9.1	6.1	5.9	-3.5	-3.7	-3.3	7.9	8.1	8.0
Central America⁶	5.4	3.8	3.9	7.2	4.2	3.6	-3.2	-2.2	-2.1	...	...	...
Caribbean⁷	13.9	9.8	8.3	12.6	13.2	6.5	4.4	0.8	2.0	...	...	...
<i>Memorandum</i>												
Latin America and the Caribbean ⁸	4.1	2.3	2.3	14.0	13.8	10.7	-2.4	-1.8	-1.5	...	...	...
Eastern Caribbean Currency Union ⁹	9.9	4.7	4.0	5.5	4.2	2.4	-13.4	-11.3	-10.2	...	...	...

Source: IMF staff estimates.

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

¹Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix. Aggregates exclude Venezuela.²Percent of GDP.³Percent. National definitions of unemployment may differ.⁴Puerto Rico is a territory of the United States, but its statistical data are maintained on a separate and independent basis.⁵See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.⁶Central America refers to CAPDR (Central America, Panama, and the Dominican Republic) and comprises Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.⁷The Caribbean comprises Antigua and Barbuda, Aruba, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.⁸Latin America and the Caribbean comprises Mexico and economies from the Caribbean, Central America, and South America. See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.⁹Eastern Caribbean Currency Union comprises Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines, as well as Anguilla and Montserrat, which are not IMF members.

Annex Table 1.1.4. Middle East and Central Asia Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment
(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices ¹			Current Account Balance ²			Unemployment ³		
	2022	Projections		2022	Projections		2022	Projections		2022	Projections	
		2023	2024		2023	2024		2023	2024		2023	2024
Middle East and Central Asia	5.6	2.0	3.4	14.0	18.0	15.2	8.6	4.1	3.6	...	...	...
Oil Exporters⁴	5.7	2.2	3.4	13.3	12.9	9.4	13.8	6.8	6.0	...	...	...
Saudi Arabia	8.7	0.8	4.0	2.5	2.5	2.2	13.6	5.9	5.4	5.6	...	...
Iran	3.8	3.0	2.5	45.8	47.0	32.5	4.2	3.4	3.7	9.3	9.4	9.6
United Arab Emirates	7.9	3.4	4.0	4.8	3.1	2.3	11.7	8.2	7.7	...	...	...
Kazakhstan	3.3	4.6	4.2	15.0	15.0	9.0	3.5	-1.5	-0.7	4.9	4.8	4.8
Algeria	3.2	3.8	3.1	9.3	9.0	6.8	9.8	2.9	1.0	...	...	...
Iraq	7.0	-2.7	2.9	5.0	5.3	3.6	17.3	-1.9	-4.3	...	...	...
Qatar	4.9	2.4	2.2	5.0	2.8	2.3	26.7	17.6	15.4	...	...	...
Kuwait	8.9	-0.6	3.6	4.0	3.4	3.1	36.0	30.3	27.7	2.2	2.2	2.2
Azerbaijan	4.6	2.5	2.5	13.9	10.3	5.6	29.8	16.3	15.7	5.9	5.9	5.8
Oman	4.3	1.2	2.7	2.8	1.1	1.7	6.4	5.1	5.4	...	...	...
Turkmenistan	1.6	2.5	2.1	11.2	5.9	10.5	7.1	3.4	1.8	...	...	...
Bahrain	4.9	2.7	3.6	3.6	1.0	1.4	15.4	6.6	7.0	5.4	...	...
Oil Importers^{5,6}	5.3	1.8	3.3	15.1	26.7	25.1	-5.1	-3.1	-3.6	...	...	...
Egypt	6.7	4.2	3.6	8.5	23.5	32.2	-3.5	-1.7	-2.4	7.3	7.1	7.5
Pakistan	6.1	-0.5	2.5	12.1	29.2	23.6	-4.7	-0.7	-1.8	6.2	8.5	8.0
Morocco	1.3	2.4	3.6	6.6	6.3	3.5	-3.5	-3.1	-3.2	11.8	12.0	11.7
Uzbekistan	5.7	5.5	5.5	11.4	10.2	10.0	-0.8	-4.3	-4.6	8.9	8.4	7.9
Sudan ⁷	-2.5	-18.3	0.3	138.8	256.2	152.4	-11.2	-1.0	-7.4	32.1	46.0	47.2
Tunisia	2.5	1.3	1.9	8.3	9.4	9.8	-8.6	-5.8	-5.4	15.2	...	...
Jordan	2.5	2.6	2.7	4.2	2.7	2.6	-8.8	-7.6	-5.4	22.9	...	...
Georgia	10.1	6.2	4.8	11.9	2.4	2.7	-4.0	-6.1	-5.8	17.3	18.4	18.6
Armenia	12.6	7.0	5.0	8.6	3.5	4.0	0.8	-1.4	-2.3	13.0	13.5	14.0
Tajikistan	8.0	6.5	5.0	6.6	4.6	5.7	15.6	-3.7	-2.4	...	...	...
Kyrgyz Republic	6.3	3.4	4.3	13.9	11.7	8.6	-46.5	-20.0	-6.1	9.0	9.0	9.0
West Bank and Gaza ⁷	3.9	3.0	2.7	3.7	3.4	2.7	...	...	...	24.4	24.2	24.0
Mauritania	6.5	4.5	5.3	9.6	7.5	4.0	-15.3	-9.9	-11.1	...	...	...
<i>Memorandum</i>												
Caucasus and Central Asia	4.8	4.6	4.2	13.0	11.0	8.3	6.0	0.4	0.6	...	...	...
Middle East, North Africa, Afghanistan, and Pakistan ⁶	5.7	1.7	3.3	14.1	19.0	16.2	8.9	4.7	4.0	...	...	...
Middle East and North Africa	5.6	2.0	3.4	14.4	17.5	15.0	10.2	5.2	4.6	...	...	...
Israel ⁸	6.5	3.1	3.0	4.4	4.3	3.0	3.4	4.2	4.0	3.8	3.5	3.9

Source: IMF staff estimates.

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

¹Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.

²Percent of GDP.

³Percent. National definitions of unemployment may differ.

⁴Includes Libya and Yemen.

⁵Includes Djibouti, Lebanon, and Somalia. See the country-specific note for Lebanon in the "Country Notes" section of the Statistical Appendix.

⁶Excludes Afghanistan and Syria because of the uncertain political situation. See the country-specific notes in the "Country Notes" section of the Statistical Appendix.

⁷See the country-specific notes for Sudan and West Bank and Gaza in the "Country Notes" section of the Statistical Appendix.

⁸Israel, which is not a member of the economic region, is shown for reasons of geography but is not included in the regional aggregates.

Annex Table 1.1.5. Sub-Saharan African Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment
(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices ¹			Current Account Balance ²			Unemployment ³		
	2022	Projections		2022	Projections		2022	Projections		2022	Projections	
		2023	2024		2023	2024		2023	2024		2023	2024
Sub-Saharan Africa	4.0	3.3	4.0	14.5	15.8	13.1	-1.9	-2.7	-2.8	...	...	...
Oil Exporters⁴	3.2	2.5	3.0	18.0	21.6	21.3	2.8	1.1	0.9	...	...	...
Nigeria	3.3	2.9	3.1	18.8	25.1	23.0	0.2	0.7	0.6	...	...	...
Angola	3.0	1.3	3.3	21.4	13.1	22.3	9.6	3.1	3.7	...	...	...
Gabon	3.0	2.8	2.6	4.3	3.8	2.5	1.6	-0.8	-2.1	...	...	...
Chad	3.4	4.0	3.7	5.8	7.0	3.5	6.2	0.2	-3.3	...	...	...
Equatorial Guinea	3.2	-6.2	-5.5	4.9	2.4	4.0	9.6	-2.6	-3.0	...	...	...
Middle-Income Countries⁵	3.6	2.7	3.6	9.4	9.4	6.6	-2.7	-3.3	-3.0	...	...	...
South Africa	1.9	0.9	1.8	6.9	5.8	4.8	-0.5	-2.5	-2.8	33.5	32.8	32.8
Kenya	4.8	5.0	5.3	7.6	7.7	6.6	-5.1	-4.9	-4.9	...	...	...
Ghana	3.1	1.2	2.7	31.9	42.2	23.2	-2.1	-2.5	-2.8	...	...	...
Côte d'Ivoire	6.7	6.2	6.6	5.2	4.3	2.3	-6.5	-4.7	-3.8	...	...	...
Cameroon	3.8	4.0	4.2	6.3	7.2	4.8	-1.8	-2.6	-2.4	...	...	...
Zambia	4.7	3.6	4.3	11.0	10.6	9.6	3.6	5.0	7.4	...	...	...
Senegal	4.0	4.1	8.8	9.7	6.1	3.3	-19.9	-14.6	-7.9	...	...	...
Low-Income Countries⁶	5.7	5.3	5.8	18.7	19.1	14.1	-6.8	-5.5	-5.7	...	...	...
Ethiopia	6.4	6.1	6.2	33.9	29.1	20.7	-4.3	-2.4	-2.0	...	...	...
Tanzania	4.7	5.2	6.1	4.4	4.0	4.0	-5.4	-5.1	-4.2	...	...	...
Democratic Republic of the Congo	8.9	6.7	4.7	9.3	19.1	10.6	-5.2	-6.0	-5.3	...	...	...
Uganda	6.4	4.6	5.7	7.2	5.8	4.7	-8.2	-7.1	-8.2	...	...	...
Burkina Faso	1.5	4.4	6.4	14.1	1.4	3.0	-6.2	-5.1	-5.2	...	...	...
Mali	3.7	4.5	4.8	9.7	5.0	2.8	-6.9	-6.5	-5.7	...	...	...

Source: IMF staff estimates.

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

¹Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.²Percent of GDP.³Percent. National definitions of unemployment may differ.⁴Includes Republic of Congo and South Sudan.⁵Includes Benin, Botswana, Cabo Verde, the Comoros, Eswatini, Lesotho, Mauritius, Namibia, São Tomé and Príncipe, and Seychelles.⁶Includes Burundi, Central African Republic, Eritrea, The Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mozambique, Niger, Rwanda, Sierra Leone, Togo, and Zimbabwe.

Annex Table 1.1.6. Summary of World Real per Capita Output
(Annual percent change; in constant 2017 international dollars at purchasing power parity)

	Average									Projections	
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
World	2.3	2.0	1.9	2.5	2.5	1.7	-4.0	5.3	3.0	2.0	1.9
Advanced Economies	0.9	1.7	1.3	2.1	1.9	1.3	-4.7	5.5	2.2	1.1	1.1
United States	0.8	2.0	0.9	1.6	2.4	1.8	-3.6	5.6	1.7	1.6	1.0
Euro Area ¹	0.4	1.7	1.6	2.5	1.6	1.4	-6.4	5.8	3.2	0.5	1.1
Germany	1.4	0.6	1.4	2.3	0.7	0.8	-3.9	3.1	1.1	-0.6	0.9
France	0.4	0.6	0.7	2.2	1.5	1.5	-7.9	6.1	2.2	0.7	1.1
Italy ²	-0.9	0.9	1.5	1.8	1.1	0.7	-8.7	7.7	4.1	1.0	1.0
Spain	-0.4	3.9	2.9	2.8	1.9	1.2	-11.6	6.5	5.1	2.0	1.3
Japan	0.6	1.7	0.8	1.8	0.8	-0.2	-4.0	2.5	1.3	2.4	1.5
United Kingdom ²	0.5	1.6	1.3	1.8	1.1	1.1	-11.4	7.3	3.3	0.0	0.2
Canada	0.9	-0.1	0.0	1.8	1.4	0.4	-6.2	4.4	1.7	-1.1	0.2
Other Advanced Economies ³	2.3	1.5	1.8	2.4	2.0	1.2	-2.2	5.8	1.8	1.0	1.6
Emerging Market and Developing Economies	4.3	2.8	2.8	3.3	3.3	2.3	-3.1	5.7	3.5	2.9	2.9
Emerging and Developing Asia	7.1	5.8	5.8	5.7	5.6	4.4	-1.3	6.7	3.9	4.6	4.2
China	9.4	6.5	6.2	6.4	6.3	5.6	2.1	8.4	3.1	5.0	4.2
India ²	6.2	6.7	7.0	5.6	5.3	2.8	-6.7	8.2	6.5	5.5	5.3
Emerging and Developing Europe	3.5	0.5	1.5	4.0	3.4	2.3	-1.5	7.4	2.7	2.7	1.9
Russia	3.3	-2.2	0.0	1.8	2.9	2.2	-2.3	6.1	-0.6	2.4	1.3
Latin America and the Caribbean	2.2	-0.8	-1.9	0.3	0.2	-1.0	-8.1	6.4	3.3	1.5	1.4
Brazil	2.6	-4.1	-3.8	0.8	1.3	0.7	-3.7	4.4	2.4	2.5	0.9
Mexico	0.4	1.5	0.6	0.8	0.9	-1.3	-9.5	4.9	3.0	2.3	1.3
Middle East and Central Asia	1.8	0.6	2.0	0.0	0.7	-0.2	-4.7	2.4	7.2	0.1	1.6
Saudi Arabia	0.7	-0.6	-1.4	-0.1	5.4	1.3	-8.9	6.5	4.0	-1.2	1.9
Sub-Saharan Africa	2.5	0.4	-1.3	0.2	0.5	0.4	-4.3	2.1	1.4	0.8	1.4
Nigeria	4.1	0.0	-4.2	-1.8	-0.7	-0.4	-4.3	1.1	0.7	0.4	0.6
South Africa	1.6	-0.2	-0.8	-0.3	0.1	-1.2	-7.3	3.8	1.1	-0.6	0.3
<i>Memorandum</i>											
European Union	0.8	2.1	1.8	2.9	2.1	1.8	-5.8	6.0	3.4	0.5	1.3
ASEAN-5 ⁴	3.7	3.3	3.6	4.1	3.9	3.2	-5.4	3.2	4.5	3.2	3.6
Middle East and North Africa	1.3	0.4	2.3	-0.7	0.4	-0.7	-5.2	2.5	3.5	0.1	1.6
Emerging Market and Middle-Income Economies	4.6	3.0	3.1	3.6	3.6	2.5	-3.0	6.4	3.4	3.3	3.1
Low-Income Developing Countries	3.5	2.2	1.5	2.5	2.7	2.6	-1.2	1.1	4.1	1.6	2.9

Source: IMF staff estimates.

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.

¹Data are calculated as the sum of those for individual euro area countries.

²See the country-specific notes for India, Italy, and the United Kingdom in the "Country Notes" section of the Statistical Appendix.

³Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

⁴ASEAN-5 comprises Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

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Inflation reached multidecade highs in many economies in 2022. While headline inflation has since come down as supply chain disruptions have eased and commodity prices have declined, core inflation is proving stickier. The specter of high inflation becoming embedded in expectations and leading to pricing choices that keep inflation high haunts central banks. This chapter unpacks recent patterns in inflation expectations and studies their role in driving inflation, and the implications for monetary policy. Expectations from professional forecasters, financial markets, and households and a new indicator for firms' views agree about broad inflation dynamics. Historical episodes in which inflation expectations rose over a sustained period of at least a year suggest that it takes about three years for inflation and near-term (over the next 12 months) inflation expectations to come back to pre-episode levels on average, given historical monetary policy reactions. Although long-term (five years in the future) inflation expectations have generally remained anchored on average, near-term expectations have risen markedly across economies since 2022. Empirical estimates of the expectations channel point to the growing importance of near-term expectations for understanding inflation dynamics. Using a new macroeconomic model with a mix of forward- and backward-looking learners, analysis shows how economies with greater shares of more backward-looking learners prolong price pressures and diminish the potency of monetary policy, since such agents do not consider the future impacts of monetary policy. The share of backward-looking learners in the economy is estimated to be larger in emerging market than advanced economies. By fostering an increase in the share of forward-looking learners, improvements in monetary policy frameworks and central bank communication strategies can help bring inflation back to target more quickly and at a lower output cost—in other words, they can increase the chances that the economy makes a “soft landing.”

The authors of this chapter are Silvia Albrizio (co-lead), John Bluedorn (co-lead), Allan Dizioli, Christoffer Koch, and Philippe Wingender, with support from Yaniv Cohen, Pedro Simon, and Isaac Warren. Arash Sheikholeslam and Mona Wang provided computational and technical assistance. Yuriy Gorodnichenko was an external consultant. The chapter benefited from comments by Robert Rich and internal seminar participants and reviewers.

Introduction

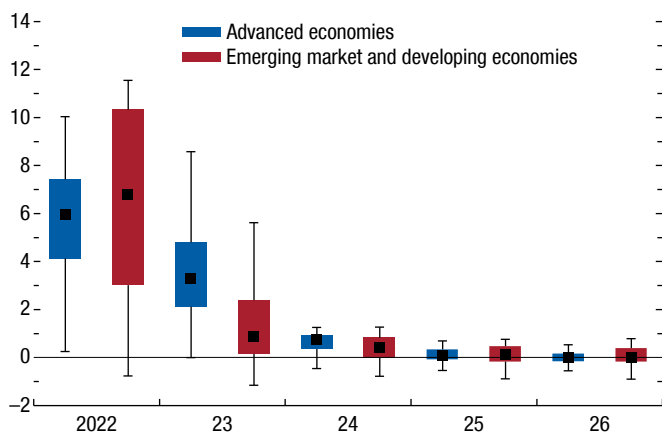
In the wake of the shocks of the COVID-19 pandemic and Russia's invasion of Ukraine, inflation around the world reached multidecade highs in 2022, well above central bank targets, particularly in advanced economies (see Chapter 1, Figure 1.7). As policy tightening gradually rebalances aggregate demand toward potential output, supply chain disruptions have eased, and commodity prices have declined, headline inflation is coming down, but underlying price pressures (as captured by core inflation) remain elevated. Professional forecasters expect inflation rates will return closer to central banks' targets in 2024, with a shift in their median deviation toward zero and a sharp narrowing of the distribution (Figure 2.1).¹ However, they also expect that, given the current contractionary stance and anticipated policy action going forward, rates will be fully back at targets only by 2026, on average.

Since consumption and investment decisions as well as price- and wage-setting processes partly reflect households' and firms' expectations about the future pace of price changes, inflation expectations play a critical role in shaping inflation dynamics. Amid the current higher inflation environment, some observers have expressed concerns that expectations could remain elevated or even rise further and long-term expectations could de-anchor from target inflation rates. In turn, expectations that future inflation will rise could feed into current inflation rates, keeping them high. If an expectations channel for inflation is important, it also means that policies that bring expectations down could help to lower inflation more quickly and easily. The idea is that the more effective monetary policy-makers are in influencing inflation expectations, the lower the cost in forgone output involved in central banks achieving their inflation objectives (Sargent 1983; Ball 1994). In other words, the expectations channel is critical to whether central banks can achieve

¹Professional forecasters are typically private sector forecasters and do not include IMF forecasters that contribute to the *World Economic Outlook* forecasts. See Consensus Economics' criteria for inclusion in their survey for further details.

Figure 2.1. Cross-Economy Deviations of Inflation Expectations from Targets
(Percentage points)

Inflation rates are expected to revert to targets, but only gradually over the next two years.



Sources: Consensus Economics; and IMF staff calculations.

Note: Inflation expectations in the figure are from professional forecasters, in order to maximize economy coverage. For each economy group, the boxes denote the upper quartile, median, and lower quartile of the distribution; the whiskers show the maximum and minimum within the boundary of 1.5 times the interquartile range.

the elusive “soft landing” of bringing the inflation rate down to target without a recession.

The relevance of inflation expectations for an economy’s inflation dynamics likely depends on the prevailing context and recent experience, as well as on the measures of inflation expectations considered (for example, near- versus long-term mean expectations). In general, when expected inflation is systematically far from actual inflation, what expectations measure is most salient for understanding inflation dynamics is an open question (Werning 2022). When inflation is low and stable at central bank targets, economic agents may become inattentive, reducing the information content of expectations (Coibion and others 2020). This may have characterized the situation in many advanced economies prior to the COVID-19 pandemic (Reis 2021). However, when inflation rises sharply or becomes volatile, then economic agents may become more attentive, and expectations may become an important driver of actual inflation.

Motivated by these considerations, this chapter aims to contribute to the large and growing literature on inflation expectations by examining alternative indicators of inflation expectations, their importance for inflation dynamics, and how their behavior may

influence monetary policy effectiveness and vice versa.² It addresses the following questions:

- How have inflation expectations across different agents and at alternative horizons behaved before and after the pandemic across economies? Are there signs of inflation expectations deanchoring since 2021? Or do the rapid interest rate hikes over 2022 appear to have contained risks?
- How important are expectations in explaining inflation dynamics, particularly since the COVID-19 shock? Does the prevailing level of inflation (high or low) affect the explanatory power of inflation expectations?
- How do expectations affect monetary policy effectiveness, and how does policy affect expectations? How does the expectations formation process affect the trade-offs that monetary policymakers face to bring inflation rates back to their targets?

Drawing on empirical and model-based analyses, the chapter’s main findings are as follows:

- *Across economic agents, movements in near-term (next-12-months) inflation expectations broadly concur, showing a sharp rise in 2022.* Survey-based measures of expectations of professional forecasters and households, financial-market-implied expectations, and this chapter’s newly constructed measure of firms’ expectations (based on the text analysis of firms’ earnings calls) fluctuate differently, but around a common trend.
- *Despite the sharp increase in inflation over 2022 across many economies, long-term (five-year-ahead) inflation expectations in the average economy have remained stable.* According to multiple metrics—including inflation target deviations, expectations’ variability, and

²Recent IMF policy contributions on the topic include Chapter 3 of the October 2018 *World Economic Outlook* (WEO), which concluded that more anchored inflation expectations improve the economic resilience of emerging market economies; Chapter 2 of the October 2021 WEO, which presented evidence that long-term inflation expectations remained anchored after the pandemic; and Chapter 2 of the October 2022 WEO, which found that the explanatory power of inflation expectations for wages after the pandemic had grown and that strong action by monetary policy to counter inflationary shocks could help ensure expectations remain anchored. Among the notable recent empirical and theoretical contributions on the topic of inflation expectations in the academic literature, see Bems and others (2021), Binder (2017), Coibion and others (2020), and Reis (2020), among many others. See also Kose and others (2019) for another overview of the literature and an examination of expectations in selected emerging market and developing economies. Note that the chapter’s focus on expectations should not be taken to suggest that they are the sole driver of inflation dynamics. They are a key contributor, but other factors are also important, as described later.

expectations' disagreement—long-term expectations have remained well anchored in most economies.

- *Historical episodes characterized by initial periods of persistently rising expectations suggest that expectations come down only slowly.* In these cases, it took about three years for inflation and near-term expectations to return to their pre-episode levels. Notably, real policy rates were lower and are now higher, on average, compared with those in past episodes, suggesting that monetary tightening since 2022 has been unusually sharp.
- *Near-term expectations are critical to understanding inflation dynamics and explain a growing share of inflation since 2022.* Using a novel causal identification strategy to estimate Phillips curves, the chapter finds a strong role for inflation expectations in the group of advanced economies. In emerging market economies, lagged inflation is also important, suggesting a greater role for more backward-looking learners. There are also signs that the pass-through from inflation expectations to inflation tends to be higher in periods of higher inflation, such as those experienced of late throughout the world.
- *The properties of the expectations formation process have a strong impact on the effectiveness of monetary policy, making central banks' understanding of them key.* A newly developed dynamic stochastic general equilibrium model with a mix of forward- and backward-looking agents that learn demonstrates that the output costs of monetary tightening rise with the share of backward-looking learners in the economy or with the prevailing level of inflation.³ The analysis also shows that both inflation expectations and inflation would decline modestly more quickly with improvements in monetary policy frameworks and communication—such as simpler and more regular messaging and better targeting of audiences—that boost the share of forward-looking learners in the economy. However, such measures may take time or be more difficult to implement than tighter cyclical policies, which come with much higher costs in terms of slowing growth.

In general, inflation dynamics depend on the shares of forward- versus backward-looking learners in the economy and their influence on expectations. If central banks

³In technical terms, the forward-looking learners form their expectations according to the standard, full-information rational expectations assumptions, whereas the backward-looking learners form their expectations through adaptive learning based on a small statistical model of the variables of interest for expectations, updating the model based on recent and past experiences only. See Online Annex 2.5 for further details.

were to focus solely on bringing inflation down quickly, they would tighten even further and reduce the time required to bring inflation rates back to targets by two years, but at the cost of a sharper economic slowdown. When policymakers choose policies to take account of the trade-offs among the objectives of inflation close to target, output at potential, and smooth policy rate paths (helping manage financial stability concerns), a scenario for a representative advanced economy facing today's inflation circumstances suggests that it is likely to take about three to four years for inflation and expectations to converge back to the central bank's target.⁴

Given the role of central banks in influencing the transmission of monetary policy, the chapter's findings suggest that they benefit from having clear understandings of the expectations formation processes at work in their economies and tailoring their communications strategies accordingly, in parallel with structural reforms to reinforce central bank independence and transparency. Managing expectations better could require investing more in data collection and monitoring of expectations, including across different agents. Technological improvements mean that alternative methods of measuring expectations—such as the text-based analysis of firms' earnings calls pioneered here—may make this more feasible.

Some caveats to the analysis and findings in this chapter should be highlighted. First, data limitations constrain the empirical analysis of inflation expectations across exercises and, especially, cross-agent comparisons. To ensure the broadest sample coverage, the chapter takes a macroeconomic perspective and focuses on mean expectations, typically among professional forecasters, rather than the distribution or behavior of individual-level expectations, which are not widely available.⁵ This may be preferable, because the analysis can provide more practical insights for

⁴Note that this conclusion is based on a stylized social welfare function (see Online Annex 2.5 for more details). See Chapter 1 of the April 2023 *Global Financial Stability Report* for a discussion of the financial stability implications of the monetary policy stance and their impact on central bank choices.

⁵Although this chapter focuses on mean inflation expectations to ensure broad country coverage, the distribution of expectations across individuals might also play an important role. See Reis (2023) and Clements, Rich, and Tracy (2023) for arguments regarding the importance for inflation of disagreements in expectations across individuals and agents. Many of the latest studies dive into the microeconomic data on inflation expectations by individuals for specific economies, contrasting their properties across agents or undertaking randomized controlled trials to identify influences on expectations. See Andre and others (2022), Candia and others (2023), D'Acunto and others (2020), Weber and others (2022), and Weber and others (2023) for recent examples.

policymakers, who likely face many of the same data constraints. Second, the causal interpretation of the Phillips curve estimates is conditional on the assumptions of the instrumental variables estimation strategy based on lags. As detailed in Online Annex 2.4, the findings are largely robust to varying the timing of the instruments, providing some comfort. However, if the underlying assumptions do not hold, then the estimates should be interpreted as associational. Third, if there have been structural breaks in the behavior of the economy, then the empirical and historical analyses may not be as informative. State dependence in the Phillips curve analysis addresses one possible form of break. The model-based analysis also affords some insurance against potential structural breaks, incorporating a limited form of structural change through learning. Fourth, the model-based analysis findings on the impact of improved monetary policy frameworks and communications on expectations and inflation are illustrative. The mapping from an increase in the share of forward- compared with backward-looking agents in the economy to monetary policy framework and communications improvements is stylized.⁶

The chapter begins by presenting patterns in inflation expectations, focusing on the postpandemic recovery. It compares them with the observed patterns after historical episodes in which expectations rose over an extended period. The chapter then uses a novel identification approach to study the channel from expectations to inflation and how well recent inflation dynamics can be explained by expectations. The penultimate section describes the results of a model-based analysis with a mix of forward- and backward-looking learning agents to examine how the expectations formation process may influence the conduct of monetary policy and vice versa. The final section suggests potential policy actions in light of the chapter's findings.

Recent Patterns in Inflation Expectations

This section first compares the recent behavior of inflation expectations across professional forecasters, financial markets, households, and firms for selected economies.

⁶Although the chapter demonstrates that improvements in monetary policy frameworks and communications are consistent with an increase in the share of forward-looking learners, it cannot exclude the possibility that other institutional or structural interventions (for example, educational attainment, fiscal frameworks, governance, and so on) could also be associated with a change in the expectations formation process. However, a full examination of these alternative interventions lies outside the scope of this chapter.

It then analyzes the evolution of near- and long-term inflation expectations of professional forecasters. Finally, it puts current macroeconomic dynamics into historical perspective by comparing them with those in past episodes in which both near- and long-term inflation expectations rose over a sustained period.

Expectations on Broad Inflation Dynamics Similar across Agents

Different economic agents may not have the same inflation expectations, reflecting their different information sets, attention, and priorities, among other factors. This subsection shows how indicators of near-term inflation expectations across agents (professional forecasters, financial markets, households, and firms) have behaved since 2017 for a selected set of four major economies for which comparable data are available (Figure 2.2).⁷ To address the scarcity of data on firm-level expectations across economies and time, a new indicator of firms' inflation expectations is constructed using text analysis of firms' earnings calls (see Box 2.1 for details). For comparability, expectations by agent type are transformed into *z*-scores.⁸

Across economies, the four agents' near-term expectations display broadly similar patterns, agreeing on the inflation upswing from 2021, but with some variation in the timing. They concur that inflation peaked in 2022 and is now on the downswing. Each of the indicators, by agent and across economies, reaches two-and-a-half to more than four standard deviations, pointing to the extraordinary size of the rise in inflation expectations during the postpandemic recovery compared with the experience since the early 2000s.

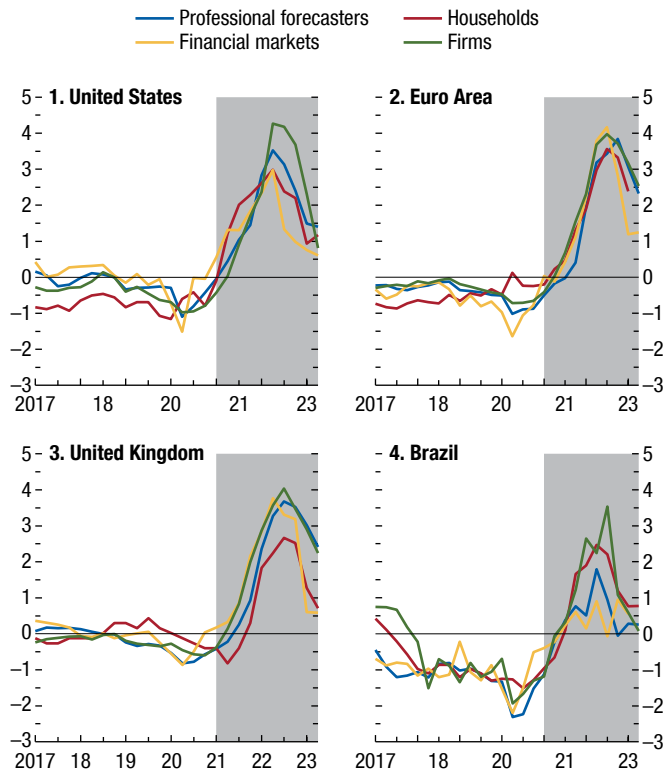
Different agents' inflation expectations exhibit slightly different properties. Households' inflation expectations appear noisier, leading and lagging movements in other agents' expectations (for the euro area and the United Kingdom, respectively). Financial-market-implied inflation expectations, derived from inflation-indexed bonds or inflation swaps, have continuous real-time availability, but disentangling the signal on expectations from the

⁷As noted in the introduction, the lack of widely available data on inflation expectations—particularly from financial markets, households, and firms—limits the economy and time coverage of the various analytical exercises undertaken in the chapter.

⁸The *z*-score transformation takes a variable and subtracts its sample mean, then divides the resulting quantity by the sample standard deviation of the variable. It is unit free and implicitly range adjusted, allowing for ready comparison of dynamics across different variables.

Figure 2.2. Next-12-Months Mean Inflation Expectations by Economic Agent
(z-score, standard deviations from the mean)

Economic agents agree on the broad dynamics of near-term inflation expectations. The sharp increases in 2022 were unusual compared to the experience of the last 20 years.



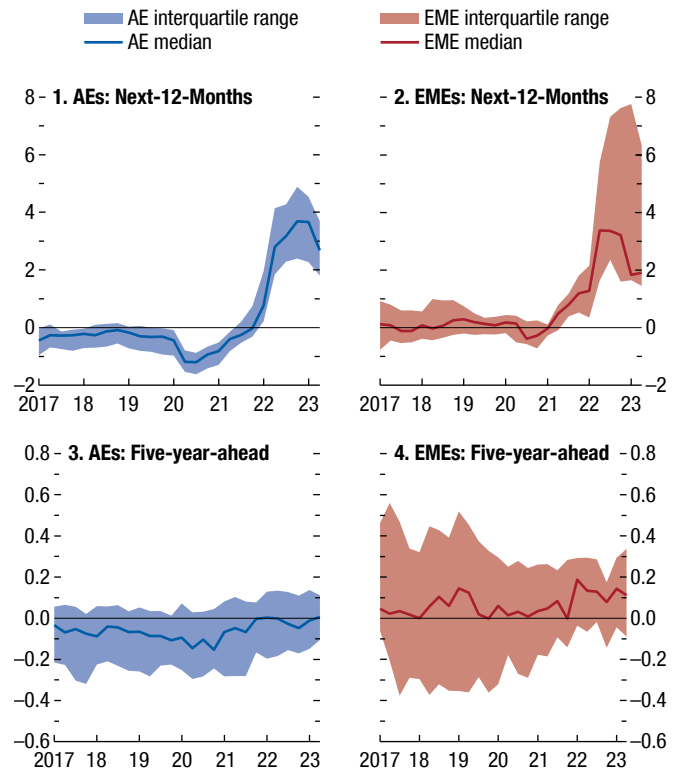
Sources: Consensus Economics; European Commission; Haver Analytics; NL Analytics; S&P Capital IQ; and IMF staff calculations.
Note: The figure shows z-scores (variable minus its mean, all divided by its standard deviation) calculated over the period 2004:Q1 to 2023:Q2 at quarterly frequency. Shaded areas in each panel highlight the period from 2021 onward, when realized inflation began notably rising.

fluctuating risk premium is challenging (Chapter 1 of April 2023 *Global Financial Stability Report*). Firms' near-term inflation expectations tend to mark the upper bound of the cross-agents expectations range during the recent inflation surge. Professional forecasters' expectations convey more signal but may suffer from herding and strategic behavior (Reis 2023).

Typically, professional forecasters' expectations fall somewhere between the more volatile, yet continuously available, market-implied and noisier household expectations. They also have the advantage of the broadest coverage among expectations measures across economies, time, and forecast horizon. As such, the analyses of the chapter mostly use the expectations of professional forecasters.

Figure 2.3. Cross-Economy Distribution of Mean Inflation Expectations over Time
(Percentage point deviation from target)

Near-term inflation expectations shot up rapidly from 2022 but are now reverting, while long-term expectations have moved only marginally, but in a narrowing range.



Sources: Central bank websites; Consensus Economics; Haver Analytics; and IMF staff calculations.
Note: Mean inflation expectations in the figure are from professional forecasters. Economies are included in the sample based on data availability. See Online Annex 2.1 for details. AEs = advanced economies; EMEs = emerging market economies.

Near-Term Inflation Expectations above Targets, Long-Term Contained

When a larger set of economies is examined, a consistent picture emerges: near-term inflation expectations in deviation from central banks' targets have risen, whereas deviations of long-term expectations have been broadly stable (Figure 2.3).⁹

For advanced economies, the period prior to the start of the COVID-19 pandemic in the first quarter of 2020 was marked by a mild undershooting of inflation expectations relative to target in both the near

⁹Central bank inflation targets are either explicit or implicit; see Online Annex 2.1 for further details on data sources. All online annexes are available at www.imf.org/en/Publications/WEO.

and long terms (Figure 2.3, panels 1 and 3). Near-term expectations rose markedly after 2021. If anything, long-term expectations in advanced economies have moved closer to inflation targets since the pandemic.

For emerging market economies, the distribution of near-term inflation expectations is somewhat wider and skewed to the upside, indicating greater variation in inflation experiences, particularly in recent quarters (Figure 2.3, panel 2). Median long-term inflation expectations have moved upward by a modest 10 basis points (Figure 2.3, panel 4). The interquartile range for long-term expectations has narrowed and shifted up somewhat. Overall, though, the patterns suggest that long-term inflation expectations have remained stable.

For both advanced and emerging market economies, multiple metrics of inflation expectations anchoring—related to the average absolute deviations from target, variability of expectations over time, and disagreement about expectations across individuals—suggest that long-term inflation expectations have stayed anchored despite recent rises in inflation (see Online Annex 2.2). Although reassuring, this anchoring of long-term expectations should not be taken for granted—it likely reflects in part the active response of policymakers to dampen price pressures.

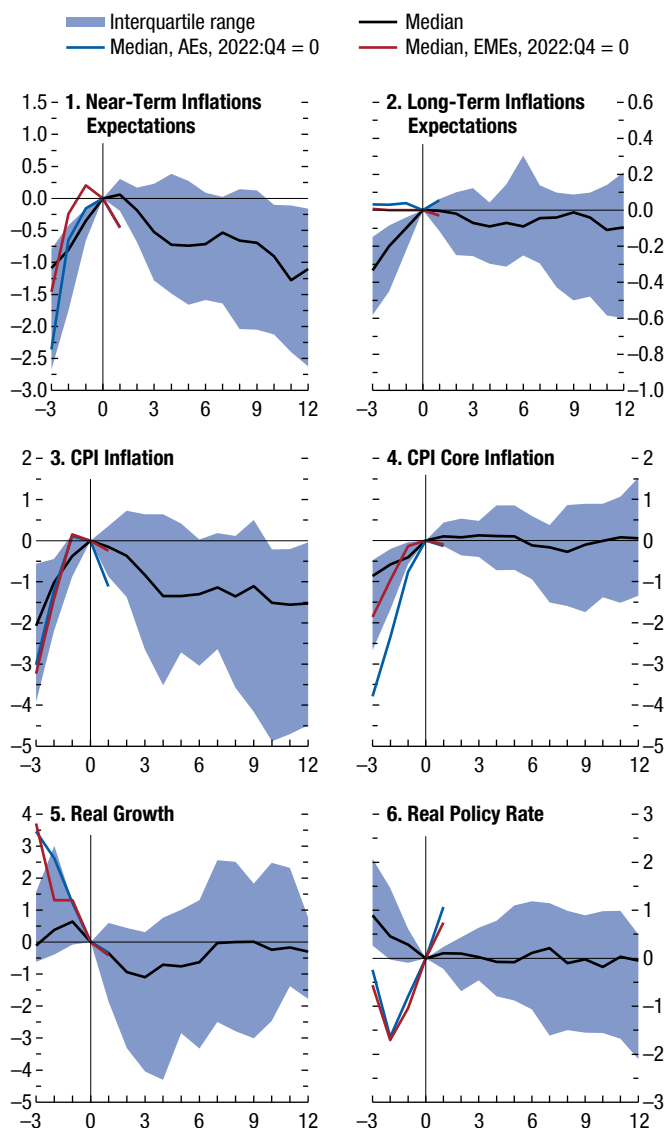
History Suggests It Can Take Time for Inflation and Near-Term Expectations to Come Down

Long-term inflation expectations have remained stable, but how unusual are the current paths of other major macroeconomic variables? To put it into historical context, the chapter compares the recent experience with that observed after historical episodes in which near- and long-term inflation expectations were rising for at least a year (Figure 2.4).

Current paths for actual inflation are so far in line with historical medians, whereas near-term inflation expectations displayed a sharper increase and a faster decline compared with those in previous episodes. After inflation expectations persistently rose over a year, economies subsequently tended to see a gradual but slow decline in headline inflation and near-term inflation expectations. Both typically take about three years to revert to their pre-episode levels, although core inflation remained stickier. However, there is a large variability across experiences, as observed in the interquartile ranges.

Figure 2.4. Historical Episodes with Persistently Rising Near- and Long-Term Inflation Expectations
(Percentage points relative to level at end of episode)

After past episodes in which inflation expectations rose persistently for a year or more, it took about three years on average for inflation and near-term expectations to come back down to pre-episode levels. Compared with those in these historical episodes, recent long-term inflation expectations have been unusually stable and real policy rate paths sharper across economy groups.



Sources: Consensus Economics; and IMF staff calculations.
Note: Horizontal axes show quarters after the end of the historical episode. All rates are expressed in annual terms. Near-term inflation expectations (panel 1) are expected inflation rates over the subsequent year on a rolling basis. Long-term inflation expectations (panel 2) are expected inflation rates in five years' time. Real policy rates are interest rates based on expected inflation. Inclusion as a historical episode requires four quarters in which both near- and long-term inflation expectations are rising. The sample spans 1989:Q4 to 2023:Q1, with exact time coverage varying by economy. A total of 32 historical episodes are identified, with 16 from AEs and 16 from EMEs. See Online Annex 2.3 for further details. AEs = advanced economies; CPI = consumer price index; EMEs = emerging market economies.

In contrast, recent paths for real policy rates and long-term inflation expectations appear different than the median paths in past episodes. On the one hand, real policy rates in 2022 were well below those in the comparative paths of earlier episodes, partly on account of the sharp and large rise in inflation. On the other hand, real rates are now well above the historical median, with the difference reflecting rapid monetary tightening and the latest falls in headline inflation. Unlike those in earlier episodes, long-term inflation expectations have been unusually stable coming into the recent high inflation regime. This is consistent with and supports the chapter’s findings on the recent stability and (so far) solid anchoring of long-term expectations.

The Role of Expectations in Inflation Dynamics

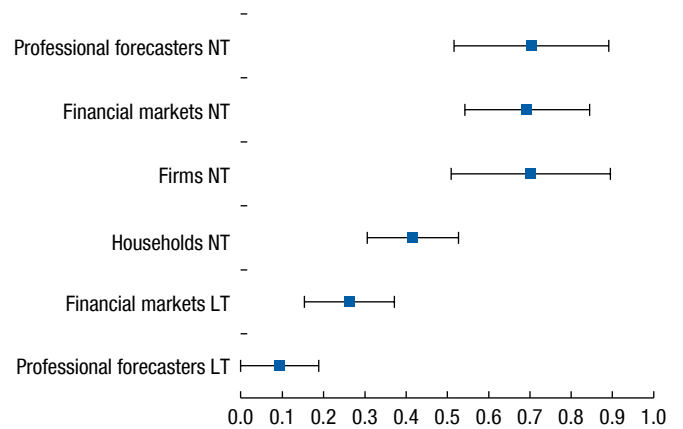
To provide a better understanding of the role of expectations in inflation dynamics, this section considers a hybrid price Phillips curve framework that relates current inflation to a set of drivers, including inflation expectations, lagged inflation, and the output gap.¹⁰ The section first assesses the explanatory power of different agents’ expectations for inflation and the relative importance of near- versus long-term expectations. Second, an instrumental variables approach is used to identify the causal impact of inflation expectations on inflation. Third, using the causal estimates, the section shows the contributions of different drivers to recent inflation dynamics for average advanced and emerging market economies. Finally, the section explores whether the effect of expectations on inflation changes with the prevailing level of inflation.¹¹

¹⁰See Chapter 3 of the October 2018 *World Economic Outlook* (WEO), Chapter 2 of the October 2021 WEO, and Chapter 2 of the October 2022 WEO for recent analyses looking at cross-economy estimates of Phillips curves (for prices and wages). Dao and others (2023) use a similar approach to analyze inflation developments in the United States and the euro area. See Online Annex 2.4 for further details on the estimation and analysis.

¹¹Other potential important dimensions in modeling the Phillips curve relationship, such as time-varying coefficients, nonlinearities, structural breaks, and the influence of higher-order moments of measured expectations, as well as alternative measures of slack, are left for future work.

Figure 2.5. Estimated Effects of Alternative Inflation Expectations Measures on Current Inflation
(Standardized regression coefficients)

Near-term measures of inflation expectations can better predict current inflation than longer-term measures. Expectations of firms, financial markets, and professional forecasters show similar performances.



Source: IMF staff calculations.

Note: The figure shows standardized coefficients from linear regressions estimated by pooled time series for the euro area, United Kingdom, and United States using quarterly data from 1991:Q2 through 2023:Q1. The dependent variable is quarterly headline inflation, seasonally adjusted at an annualized rate. See Online Annex 2.4 for details on the regression specification and additional control variables. Horizontal lines show 90 percent confidence intervals with heteroskedasticity-robust standard errors. LT = long-term (five-year-ahead; for financial markets is next-five-years) inflation expectations; NT = near-term (next-12-months) inflation expectations.

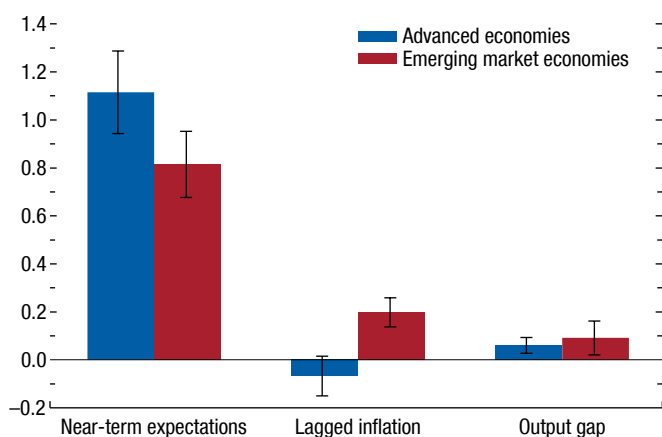
Near-Term Expectations Matter Most for Inflation

When considered one by one, alternative measures of inflation expectations (by agents or horizons) show different abilities to explain inflation when the hybrid Phillips curve model is used (Figure 2.5). The coefficient estimates represent the change in inflation associated with a one standard deviation increase in the indicated measure of expectations.¹² The first finding is that long-term inflation expectations have lower predictive power than near-term measures. Both financial-market-based and professional forecasters’ five-year-ahead inflation expectations have smaller standardized coefficients than other measures (Figure 2.5, bottom two sets of boxes and whiskers). These results are consistent with those of recent

¹²The coefficients are standardized to account for the volatility of different measures and to allow a comparison of inflation forecasts with the new index of firms’ inflation expectations, which is based on a different scale. Because of lack of data availability, this comparison can be undertaken for the United Kingdom, the United States, and the euro area.

Figure 2.6. Key Coefficients of the Hybrid Phillips Curve
(Regression coefficients)

Near-term inflation expectations play a larger role in explaining current inflation in advanced economies than in emerging market economies.



Source: IMF staff calculations.

Note: The figure shows coefficients from linear regressions estimated by pooled time series using quarterly data from 1991:Q2 through 2023:Q1. The dependent variable is quarterly headline inflation, seasonally adjusted at an annualized rate. See Online Annex 2.4 for details on the regression specification and additional control variables. Whiskers show the 90 percent confidence intervals with Driscoll-Kraay standard errors.

work that finds a small role for long-term expectations on current inflation (Werning 2022; Hajdini 2023). Second, there is remarkable consistency across professional forecasters', financial markets', and firms' near-term inflation expectations (Figure 2.5, top three boxes and whiskers). These results imply that a one-standard-deviation increase in expectations is associated with a 0.7 standard deviation increase in current inflation.¹³ Finally, the coefficient for households' near-term expectations falls somewhere between those for near- and long-term expectations of other agents.

In light of these findings and crucially because of broader economy and time coverage, the baseline specification of the hybrid Phillips curve is estimated using near-term inflation expectations from professional forecasters (Figure 2.6). The estimated relationship suggests that a 1 percentage point rise in near-term expectations is associated with a 1.1 percentage point rise in current inflation among advanced economies, whereas for emerging market economies, the rise is about

¹³Coefficients for inflation expectations unadjusted for volatility range from 1.1 to 1.4. The estimated coefficients for long-term expectations are lower than those for near-term expectations. Excluding the post-2019 period results in lower estimated coefficients, but similar patterns.

0.8 percentage point. Lagged inflation has little explanatory power in advanced economies (slightly negative but not different from zero with statistical significance), whereas in emerging market economies, the carryover from the previous quarter's inflation (about 0.2 percentage point) is statistically significant.¹⁴ Finally, the output gap has a statistically significant relationship with current inflation for both economy groups but is somewhat larger for the group of emerging market economies.

Expectations' Role for Inflation May Be Smaller Than Simple Statistical Associations Suggest

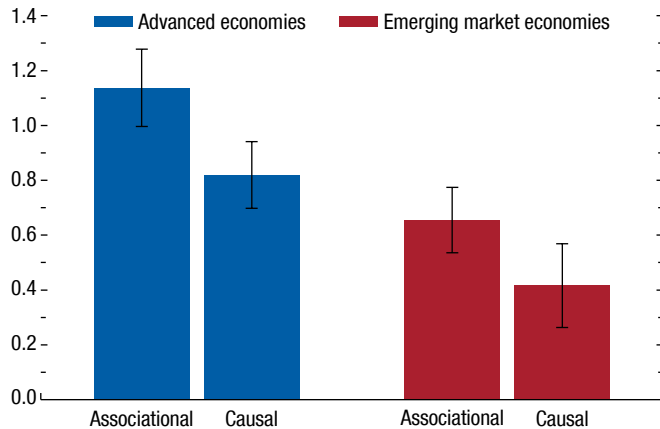
The previous results document statistical associations between current inflation and near-term inflation expectations—they do not account for the possibility that current inflation could drive expectations of future inflation or that omitted factors could be driving both. To address these shortcomings and estimate the causal effect of expectations on inflation (the expectations channel), an instrumental variables strategy based on lags of near-term inflation expectations and the output gap is used to reestimate the hybrid Phillips curve. The strategy leverages the facts that these variables display serial correlation over time (current values are strongly related to their past values) and that lags of these variables do not directly affect current inflation under the hybrid Phillips curve specification.¹⁵

¹⁴Chapter 3 of the October 2016 *World Economic Outlook* (WEO) and Chapter 2 of the October 2016 and October 2021 WEO, respectively, as well as Kamber, Mohanty, and Morley (2020), also find higher coefficients for lagged inflation in hybrid Phillips curves in emerging market economies compared with those in advanced economies. Forbes, Gagnon, and Collins (2021) demonstrate that the coefficients on lagged inflation decrease when panel estimates include only advanced economies. These studies do not explore potential causes, but the higher prevalence of price indexation in many emerging market economies may account for these findings (Céspedes and others 2005; Frankel 2010; Kganyago 2023). In addition, weaker monetary policy frameworks, on average, could also contribute to the smaller relative role of expectations. It might also be rational for adaptive learners to rely more on past inflation when indexation is more prevalent and the credibility of policymaking institutions is lower. Improvements in monetary policy frameworks and communications in emerging market economies over the past 15 years (see Box 2.2) suggest that lagged inflation could play a reduced role in these economies' inflation dynamics going forward. Finally, emerging market economies might suffer from larger measurement error on inflation expectations, which would lead to an attenuation bias and a relatively more important estimated role for lagged inflation.

¹⁵See Online Annex 2.4 for further details on the model specification, instrumental variables strategy, its performance and key results, and robustness checks. The instrumental variables estimates are stable across time periods.

Figure 2.7. Associational versus Causal Estimated Effects of Inflation Expectations on Current Inflation
(Regression coefficients)

Accounting for the influence of current inflation on expectations of future inflation in the Phillips curve reduces the estimated effects of inflation expectations on current inflation by about 30 percent across economy groups.



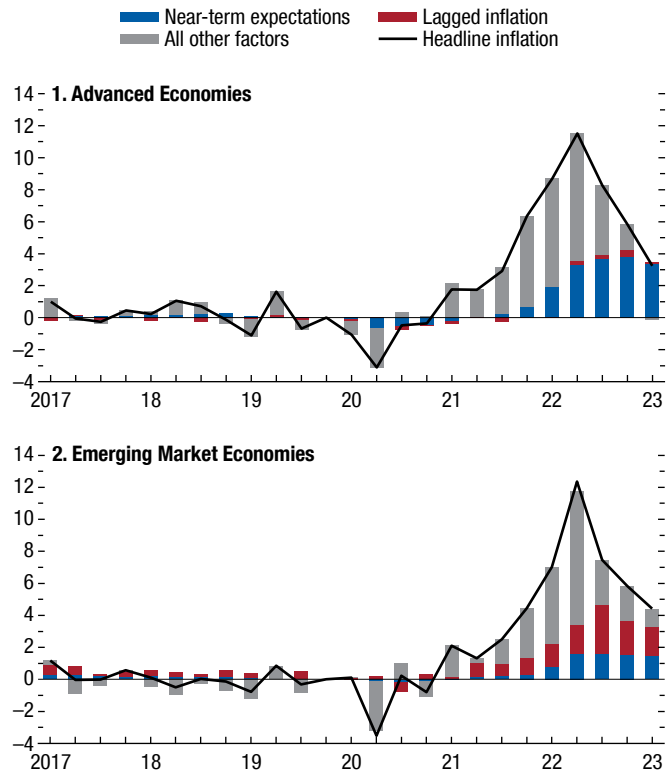
Source: IMF staff calculations.

Note: The figure shows coefficients from linear regressions estimated by pooled time series using quarterly data from 1991:Q2 through 2023:Q1. Whiskers show the 90 percent confidence interval around the estimated coefficient. The dependent variable is quarterly headline inflation, seasonally adjusted at an annualized rate. Associational estimates are computed by ordinary least squares, while causal estimates are computed using an instrumental variables approach. Models include economy and time fixed effects along with additional control variables. See Online Annex 2.4 for further details on the specification and instrumental variables strategy.

The causal estimates of the effects of near-term expectations on current inflation are about 30 percent lower in magnitude than the associational estimates (Figure 2.7). This implies that some of the observed variation in near-term inflation expectations reflects reverse causation (that is, higher current inflation drives up expectations of future inflation) or omitted factors that affect both current inflation and expectations. By removing these biases, the instrumental variables estimates provide a more accurate assessment of the expectations channel. For the average advanced economy, inflation would rise by about 0.8 percentage point for a 1 percentage point rise in near-term expectations. The pass-through estimate for the average emerging market economy is about 0.4 percentage point. The difference in magnitudes, combined with differences in the relationship of current inflation to past inflation, suggests that expectations formation in emerging market economies on average tends to be more backward looking than what is observed in advanced economies.

Figure 2.8. Contributors to Recent Inflation Dynamics
(Percentage point deviation from 2019:Q4)

A decomposition of the recent dynamics of headline inflation reveals the growing importance of near-term inflation expectations.



Source: IMF staff calculations.

Note: Bars in the figure show the contributions to average headline inflation by economy group relative to the contributions observed in 2019:Q4. Contributions are calculated using coefficients estimated by instrumental variables pooled time series with quarterly data over 1991:Q2–2023:Q1. The black lines in each panel show the average seasonally adjusted annualized quarter-on-quarter headline consumer price index inflation observed relative to 2019:Q4. The “All other factors” category includes the contributions from time fixed effects (common global factors), all other explanatory variables, and the regression residual. See Online Annex 2.4 for details on the specification and estimation.

Expectations Explain an Increasing Share of Recent Inflation Dynamics

The contribution to recent inflation dynamics of the expectations channel can be calculated using the causal estimates of the hybrid Phillips curve (Figure 2.8). For the average advanced economy, factors other than expectations and lagged inflation initially drove most of the increase in inflation that took place over 2021–22 (Figure 2.8, panel 1). These include common global factors, such as the economic disruptions caused by the COVID-19 shock, large swings in commodity prices, and global supply chain issues, as well as the economy-specific effects of energy prices and the

output gap (which may in turn reflect domestic aggregate demand measures). Even so, Figure 2.8 reveals a large and growing role for near-term inflation expectations in explaining inflation dynamics in the most recent quarters.¹⁶ In contrast, lagged inflation had a small role.

Turning to the average emerging market economy, once again factors other than expectations and lagged inflation were responsible for the peak in inflation in 2022 (Figure 2.8, panel 2). On average, expectations have played a significant but smaller role in accounting for headline inflation than among advanced economies. On the other hand, lagged inflation explained almost half of the average rise in inflation since the first quarter of 2020.

Higher Inflation Environment, Higher Pass-Through from Expectations

The final exercise in the section consists of estimating whether the pass-through from inflation expectations to current inflation varies by the level of inflation: Are there signs of a nonlinearity or state dependence in the effect of expectations on inflation? In both advanced and emerging market economies, the estimated pass-through is higher when inflation is elevated (above its economy-specific sample median; Figure 2.9). The difference is particularly large, with the coefficient increasing from 0.6 when inflation is low (below its economy-specific sample median) to 0.9 when inflation is high and statistically significant for advanced economies. These results imply that the expectations channel may be even more important in accounting for inflation dynamics at present, while inflation remains high.

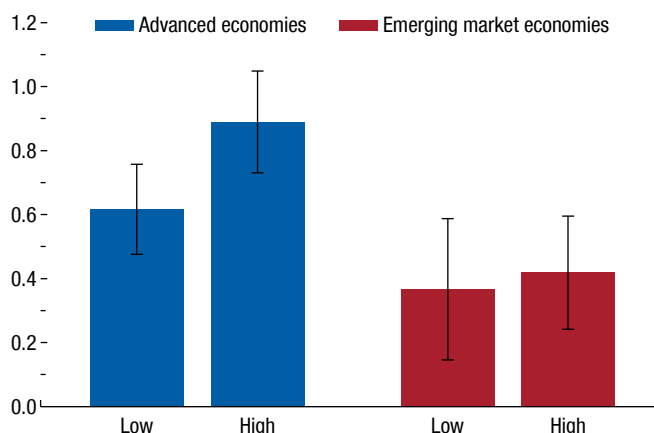
Expectations Formation and Monetary Policymaking

This section explores the question of how inflation expectations affect monetary policy effectiveness and how different policies can affect expectations. It uses a semistructural model to illustrate how the expectations formation processes in an economy

¹⁶Other factors have remained relevant in recent quarters despite a net contribution approaching zero, as shown by the gray bars in Figure 2.8, panel 1. This is because the pass-through from lower energy prices has been offset by other factors, mainly captured by quarterly fixed effects.

Figure 2.9. State-Dependent Pass-Through from Expectations to Inflation
(Regression coefficients)

The pass-through (or effect) from inflation expectations to current inflation is higher when the prevailing level of inflation is higher across economy groups. The difference in pass-through by prevailing level of inflation is larger for advanced economies.



Source: IMF staff calculations.
Note: Bars in the figure show the average estimated coefficients from regressions of headline inflation on inflation expectations by economy group, interacted with an indicator for whether lagged headline inflation was above an economy's median inflation level over the sample period. Estimation is via instrumental variables using quarterly data over 1991:Q2–2023:Q1. See Online Annex 2.4 for further details on the regression specification and estimation. The whiskers show the 90 percent confidence interval using heteroskedasticity-robust standard errors.

interact with monetary policy actions, affecting the dynamics of inflation, expectations, and economic activity.

The analysis extends the standard dynamic stochastic general equilibrium model with expectational learning by Alvarez and Dizioli (2023). The model includes price and wage Phillips curves (relating price and wage inflation to expectations, the gap between real wages and productivity, and economic slack), an IS curve (relating output to the nominal interest rate and inflation expectations), and a monetary policy reaction function.¹⁷ Two new features are incorporated into the model. First, heterogeneous agents or a mix of backward- and forward-looking learners with different information sets are added. Backward-looking learners form their expectations based on their recent experience, whereas forward-looking learners form their expectations rationally based on full information about the

¹⁷See Online Annex 2.5 for more details about the model, its structure, and its estimation.

economy, including the share of backward-looking learners. This means that forward-looking learners will behave more like backward-looking learners as the share of backward-looking learners rises in the economy.¹⁸ Second, as inspired by Blanchard and Bernanke (2023), near-term expectations are influenced by long-term expectations and vice versa. The main additional assumption is that long-term expectations have an impact on inflation only through their effect on near-term expectations. An alternative model allowing only forward-looking learners is also considered for comparison. The two models—heterogenous expectations and forward-looking learners or rational expectations only—are estimated for two representative economies (advanced and emerging market) to help capture the structural differences between the two economy groups. With heterogenous agents, the estimated shares of backward-looking learners are about 20 percent for the advanced economy and about 30 percent for the emerging market economy, with the remainder being forward-looking learners.

More Backward-Looking Learners Prolong Inflation and Weaken Monetary Policy Transmission

The propagation of shocks to the economy depends upon how expectations are formed. Following an identical cost-push shock (for example, a surprise rise in energy and commodity prices, an unanticipated supply chain disruption raising input costs, or other supply-side shocks), inflation is persistently higher when there are heterogenous agents in the economy, as compared with an economy that has only forward-looking learners. With a share of backward-looking learners in the economy, inflation expectations respond more to a cost-push shock and are stickier. Backward-looking learners assume that higher current inflation means that future inflation will be persistently higher. This prolongs the price pressures compared with those in the economy with forward-looking learners who know that the cost-push shock is transitory and do not change their inflation expectations much (Figure 2.10,

¹⁸Other expectations formation processes are possible (for example, completely anchored, unresponsive inflation expectations). The chapter does not aim to be exhaustive. It illustrates instead how a plausible mix of two highly relevant kinds of processes may affect developments.

panels 1–4). Moreover, with heterogenous agents, monetary policy has less power initially to influence inflation (Figure 2.10, panels 5–8). The main reason is that backward-looking learners do not consider the impact of monetary policy on future marginal costs, unlike forward-looking learners. Without this forward-looking component, monetary policy can influence expectations only through its direct effects on the output gap.

Higher Sacrifice Ratio with More Backward-Looking Learners or Higher Inflation

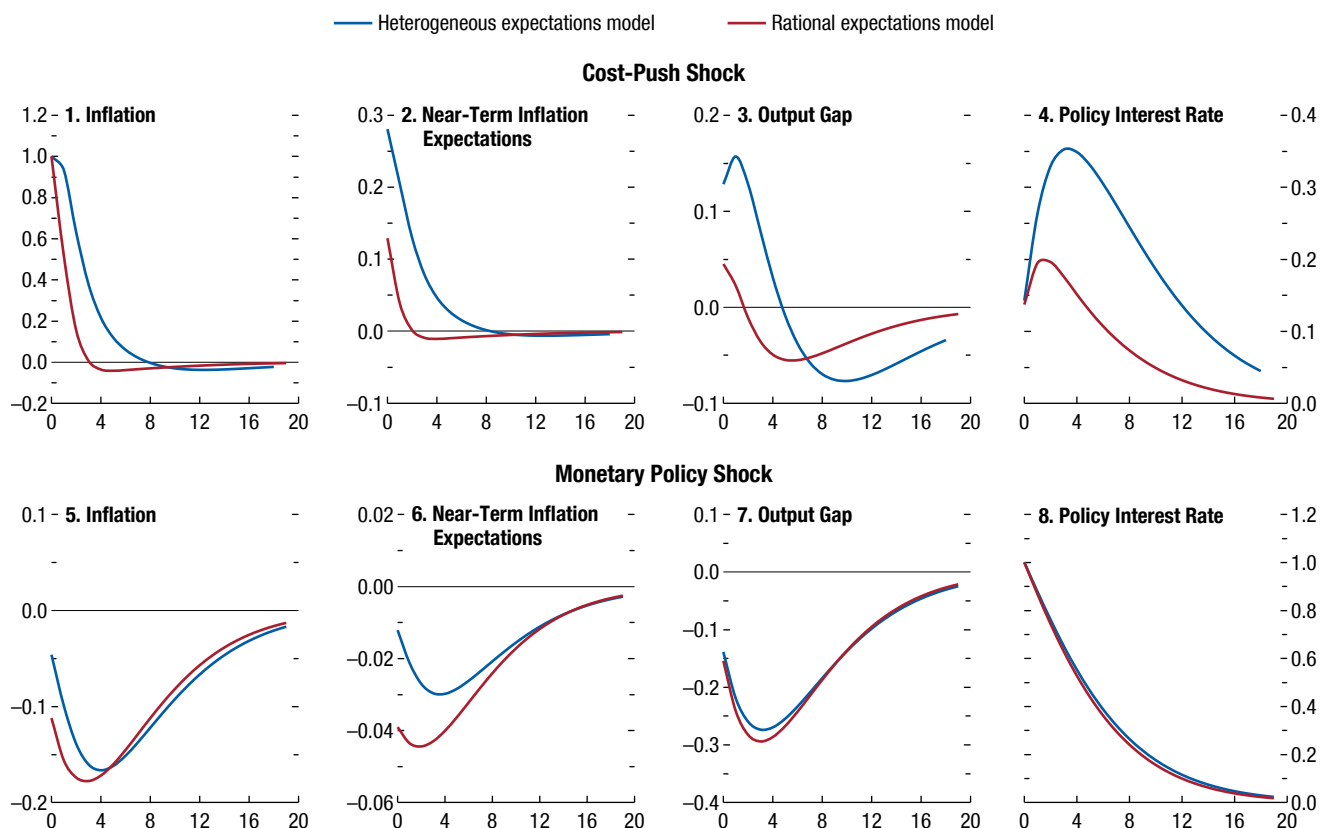
The combination of more prolonged inflationary episodes following a cost-push shock and less powerful monetary policy implies that achieving a given level of inflation reduction over a given period will be more costly in terms of output forgone. This will be reflected in the level of the sacrifice ratio, defined here as the percentage of output forgone to achieve a 1 percentage point faster reduction in the inflation rate over a three-year period (Figure 2.11).¹⁹ First, the sacrifice ratio is larger in the heterogenous agents' model than in the rational expectations model with only forward-looking learners (regardless of the economy group). The main reason for this increased sacrifice ratio is the weaker inflation expectations channel for monetary policy when there are more backward-looking learners in the economy. Second, the sacrifice ratio also tends to be higher for an emerging market than an advanced economy, as the former is estimated to have a higher share of backward-looking learners. Third, when there are heterogenous agents, the economy's dynamics become state dependent. In a high-inflation environment, backward-looking learners behave as though inflation will be permanently higher, entailing a slight endogenous inflation de-anchoring and making monetary policy's job harder (Figure 2.11, rightmost bars).²⁰

¹⁹Tetlow (2022) reports a wide range of sacrifice ratio estimates for advanced economies, with a mode of seven (similar to that presented here) across 40 different models and slightly different definitions. That said, the chapter's focus is on the qualitative comparison across cases.

²⁰To get closer to current conditions, a high-inflation environment is simulated by running the model for eight periods, with inflation 2 percentage points above target, to establish the initial conditions for the scenario.

Figure 2.10. Macroeconomic Responses to Shocks Conditional on Agents' Expectations Formation
(Percentage points)

Following a cost-push shock, inflation expectations are more sensitive when the economy has a mix of forward- and backward-looking learners (heterogeneous expectations) than when it has only forward-looking learners (rational expectations). Inflation is also more persistent. Monetary policy is less effective, as backward-looking learners do not take account of the effects of interest rate rises on future marginal costs.



Source: IMF staff calculations.

Note: Numbers on the horizontal axes in the panels represent quarters after the shock at time 0. Panels 1–4 show the impulse responses to a cost-push shock that increases inflation by 1 percentage point. Note that the output gap increases after this shock, because potential output falls by more than real GDP. Panels 5–8 show the impulse responses to a temporary monetary policy shock that increases the policy rate by 100 basis points. Note that the monetary policy shock's impact on inflation peaks after five quarters in the heterogeneous-expectations model and after three quarters in the rational-expectations model.

Monetary Policy Framework and Communications Improvements Ease Disinflation

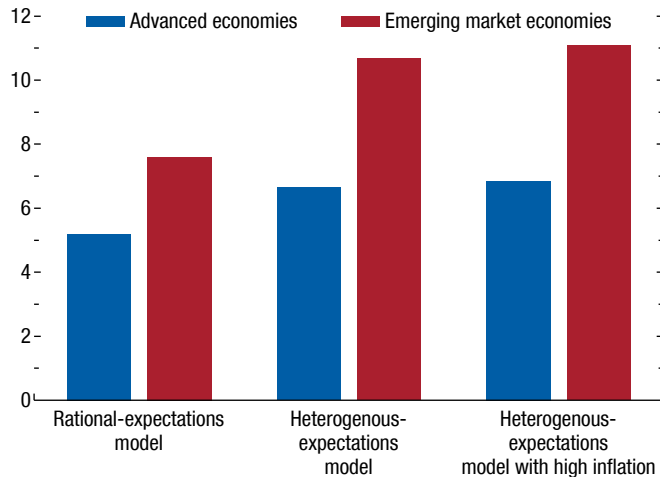
The estimated model offers a laboratory for considering how alternative policy interventions help hasten a decline in inflation. The first intervention examined is one that would lead to an increase in the share of forward-looking learners in the economy.²¹ How might such a shift be achieved?

²¹Several studies over the past several years indicate that most individuals do not understand the central bank's role in the economy and how policy rate changes affect the economy, suggesting that their expectations may be distorted. See, among others, Coibion, Gorodnichenko, and Weber (2022), ECB (2021), Kumar and others (2015), and van der Cruysen, Jansen, and de Haan (2015). Andre and others (2022) find that over a sample of 6,500 US households, households on average believe that a rise in a central bank's policy interest rate would increase inflation.

Recent studies suggest that improvements in monetary policy frameworks—encompassing central banks' independence and transparency and their communications strategies—can increase agents' attention to and understanding of monetary policy actions, helping to make inflation expectations more forward looking (Coibion and others 2020; Carotta, Mello, and Ponce 2023). Brazil's recent decision to adopt a continuous (rather than calendar year) 3 percent inflation rate target from 2025 onward is a concrete example of an improvement in operational effectiveness and communications strategy, helping to reduce uncertainty and enhance monetary policy effectiveness. Additional examples of improvements in communications strategies include actions since 2020 by the central banks of Pakistan

Figure 2.11. Sacrifice Ratios under Alternative Expectations Processes
(Percent of output forgone to lower inflation by 1 percentage point)

Sacrifice ratios are larger when economies include a mix of forward- and backward-looking learners (heterogenous expectations), as monetary policy is less effective in that case. Emerging market economies tend to have higher shares of backward-looking learners, pushing up their ratios. Higher prevailing inflation slightly worsens the ratio, as backward-looking learners raise their expectations.



Source: IMF staff calculations.
Note: The sacrifice ratios in the figure are calculated under the assumption that monetary policy is implemented to bring the inflation rate down by 1 percentage point over three years. See Online Annex 2.5 for further details on the dynamic stochastic general equilibrium model.

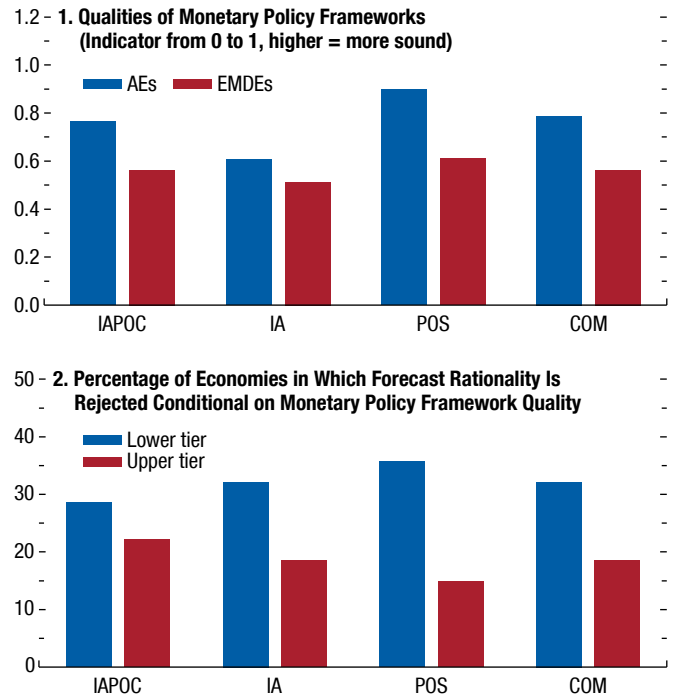
and Uruguay to announce their preset monetary policy meeting calendar in advance. Additional examples of improvements in operational effectiveness include decisions since 2019 by the central banks of Chile and Thailand to state their primary policy objective as price stability, with clearly defined numerical targets. Through the lens of the model, the chapter quantifies the potential effects of such interventions in a stylized, illustrative manner.

Moreover, an association exists between the qualities of the monetary policy framework in an economy and the likelihood that a simple forecast rationality test of mean inflation expectations is rejected (Figure 2.12; see also Online Annex 2.5). When monetary policy frameworks are weaker (in terms of central bank independence, transparency, and communications), the share of economies in which forecast rationality of expectations is rejected tends to be higher, consistent with a greater incidence of backward-looking learners.²²

²²The monetary policy framework indicators come from Unsal, Papageorgiou, and Garbers (2022). See also Box 2.2.

Figure 2.12. Soundness of Monetary Policy Frameworks and Forecast Rationality Tests across Economies

Monetary policy frameworks in advanced economies score higher along multiple dimensions, on average, than do those in emerging market and developing economies. Forecast rationality is statistically rejected more often for economies that have lower-quality monetary policy frameworks.



Sources: Unsal, Papageorgiou, and Garbers (2022); and IMF staff calculations.
Note: Panel 1 shows the mean of the indicator by economy group for which data are available (2007–21). Panel 2 of the figure shows the share of economies (among those with expectations from professional forecasters) for which a simple forecast rationality test (Lovell 1986) rejects the hypothesis of rational expectations. See Online Annex 2.7 for further details. AEs = advanced economies; EMDEs = emerging market and developing economies; IAPOC = Overall Monetary Policy Framework index, which is composed of three pillars: Independence and Accountability (IA), Policy and Operational Strategy (POS), and Communications (COM).

Further bolstering the evidence on the importance of the soundness of monetary policy frameworks, a negative association exists between the size of deviations of near-term inflation expectations (or realized inflation rates) from targets and the quality of monetary policy frameworks. As monetary policy frameworks improve, the deviations from target are smaller, implying that inflation comes back to target more quickly, on average (see Online Annex 2.7).

Although there has been a notable trend toward improving frameworks in emerging market and developing economies (Box 2.2), the quality of monetary policy frameworks and communications is higher, on average, in advanced economies than in emerging market and

developing economies. As such, the analysis of the policy intervention considers a decline in the share of backward-looking learners in the economy equal to the difference between the share of backward-looking learners in the representative emerging market versus that in the representative advanced economy.²³ With a higher share of forward-looking learners, the same monetary policy tightening path as under the baseline would have stronger effects on inflation expectations (Figure 2.13, panels 1, 3, and 5). Monetary policy is more effective not only because forward-looking learners understand the impacts on future marginal costs, but also because they know that there is a lower share of backward-looking learners in the economy and hence become even more forward looking. These results are consistent with findings highlighted in Box 2.1, in which US monetary policy is found to be more effective in shaping expectations when firms are more attentive to monetary policy than the average firm in the sector and therefore are more forward looking. The faster transmission to inflation expectations translates into a lower realized inflation path and importantly a softer landing, with only small additional output costs.

In contrast, even tighter cyclical policies (either monetary or fiscal) as additional interventions also help dampen inflation and expectations, but come with larger output costs (Figure 2.13, panels 2, 4, and 6). While the two cyclical policy interventions are not strictly comparable, they both work in part through generating lower aggregate demand initially.²⁴ Over time, then, the inflation-lowering effects of tightening feed into inflation expectations, further lowering realized inflation.

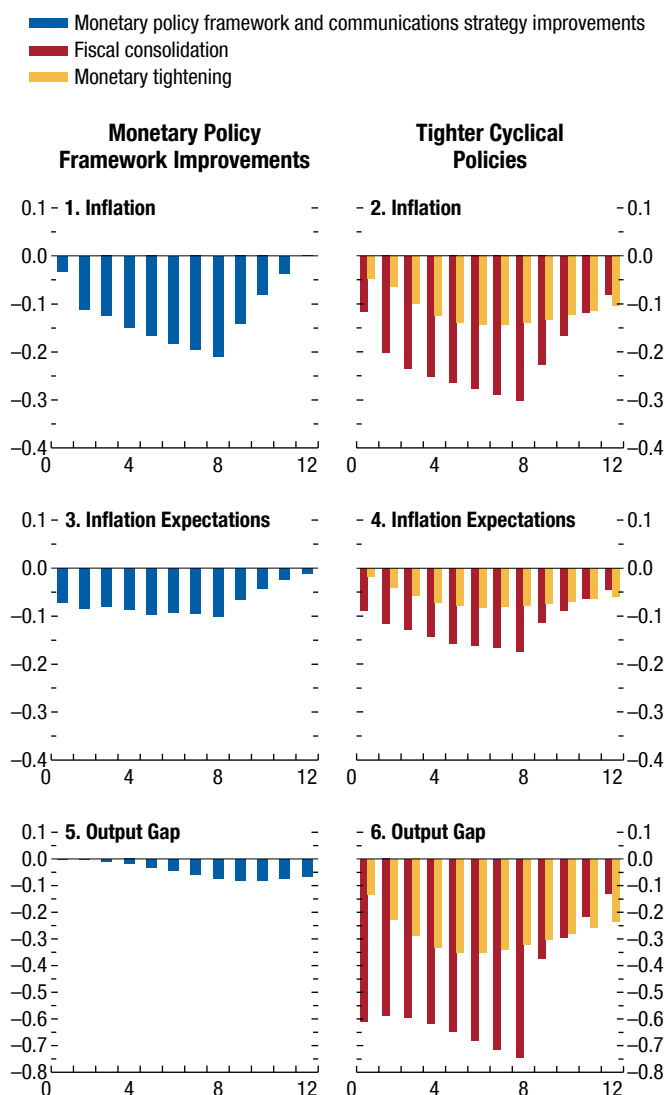
Although an improvement in monetary policy framework and communications comes with markedly lower output costs due to its primary impacts on expectations and their formation, difficulties in implementing these interventions in a timely and effective manner mean that they are not silver bullets and should be seen as complementary to usual monetary policy actions.

²³The difference in the share of backward-looking learners is about 8 percent.

²⁴Specifically, the illustration assumes standard unit policy interventions on impact, with policy persistence properties that differ across the fiscal and monetary interventions, as described in the note to Figure 2.13. Learning dynamics in the model also imply that the evolution of the system can depend on the specific properties of the intervention, as well as the prevailing context. See Online Annex 2.5 for further details.

Figure 2.13. Policy Interventions to Hasten the Reduction of Inflation and Inflation Expectations
(Percentage point, deviation from baseline)

Improvements in the monetary policy framework and communications strategy that boost the share of forward-looking learners in the economy improve the trade-off between lowering inflation and fostering growth through their effects on the expectations channel. Tighter cyclical policies—fiscal consolidation and monetary tightening—also lower inflation and inflation expectations, but at a higher output cost.



Source: IMF staff calculations.

Note: Horizontal axes show quarters since the indicated intervention at time $t = 1$. The “Monetary policy framework and communications strategy improvements” intervention assumes that the share of forward-looking learners increases, compared with the baseline, by the difference in the estimated shares in the advanced versus the emerging market economy models. The “Fiscal consolidation” intervention assumes that fiscal spending is cut by 1 percent of GDP for two years and monetary policy does not try to offset the effects of the fiscal efforts. The “Monetary tightening” intervention assumes an initial 100 basis points rise in the policy rate on impact that then declines endogenously. See Online Annex 2.5 for details on the dynamic stochastic general equilibrium model and its calibration.

Moreover, the role of fiscal policy for inflation and inflation expectations is likely more complex than what can be captured by the illustrative model here. As shown in the empirical analysis in Box 2.2, worse fiscal positions (that is, higher public debt and persistent deficits) can reduce the effectiveness of sounder monetary policy frameworks in lowering inflation expectations in emerging market and developing economies. In other words, more sustainable fiscal positions are associated with lower average inflation expectations. Even so, there may be conditions under which fiscal support measures may help to lower inflation or at least smooth out a sharp inflationary shock, as seen in Box 2.3’s analysis of the fiscal relief measures to offset the energy shock in Europe in 2022. Consumers’ perceived or expected persistence of these measures is critical to how they affect the path of inflation.

Monetary Policy Faces Inflation-Output Trade-Offs

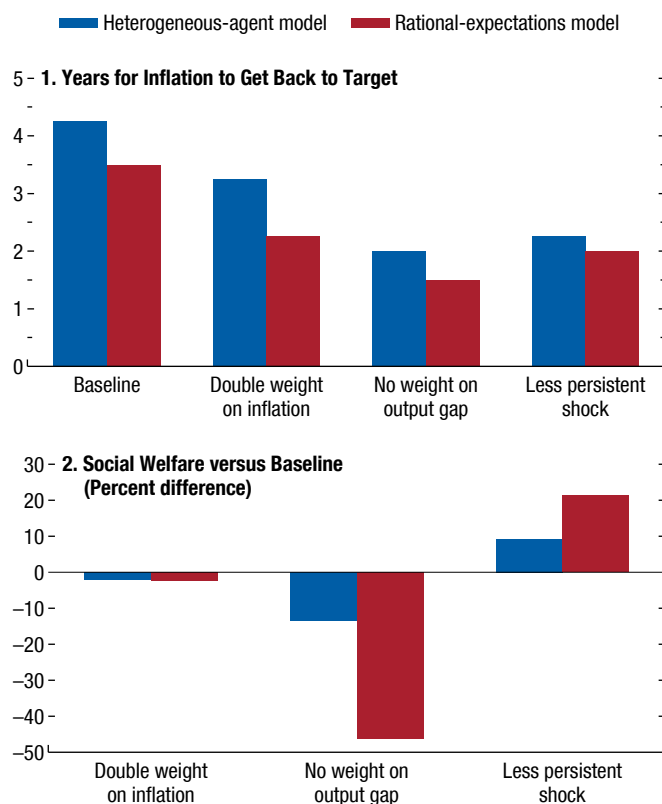
In the current context in which core inflation in many countries is more persistent than initially expected, an important question policymakers face is the timeline for bringing inflation back to target. This subsection illustrates how a central bank’s optimal choice, one that minimizes a stylized welfare loss function, would vary with its objectives and the properties of the underlying shocks in the context of the illustrative model. The baseline case assumes that the central bank seeks to minimize a function that equally weights the welfare losses from the output gap and inflation target deviations, alongside a smoother policy rate path.²⁵ In the heterogeneous agents’ model, the central bank under the baseline would opt to calibrate the policy rate path to bring inflation back to target in about four years (Figure 2.14, panel 1).²⁶ If the central bank were to accelerate this process and decided to double the weight of inflation in its objective function, then it would aim for inflation to come back to target in about three years. In a more extreme case in which

²⁵Specifically, the exercise assumes that the central bank minimizes a welfare loss function that values interest rate smoothing and equally weights output and inflation deviations (a quadratic loss function). The central bank is also assumed to know the expectations formation process in the economy and to have full information on the path of future cost-push shocks. See Online Annex 2.7 for more details on the exercise.

²⁶Since shock persistence is highly uncertain, this subsection presents two scenarios assuming different degrees of persistence. If the shock turns out to be less persistent, monetary policy will be able to bring inflation back to target in less than four years (Figure 2.14, panel 2).

Figure 2.14. Policy Objectives, Social Welfare, and Expectations Formation

After a cost-push shock, the time it takes inflation to get back to target in an economy depends on the formation of expectations and the central bank’s objectives. A greater share of backward-looking learners in the economy draws out the timeline, regardless of policy objectives. A comparison with a stylized social welfare function suggests that a faster path may come with costs unless driven by less persistent shocks.



Source: IMF staff calculations.

Note: The figure assumes that a cost-push shock raises inflation 2 percentage points above target initially. The shock has an estimated half-life of 14 quarters. In the baseline scenario, the central bank’s policy seeks to minimize welfare loss, as measured by a stylized social welfare function. The latter includes an interest rate smoothing term and weighs output gap and inflation deviations equally. Panel 2 welfare baselines differ by the expectations formation process. For an identical welfare function, social welfare is about 20 percent higher with rational than with heterogeneous expectations, reflecting enhanced policy effectiveness and lower endogenous persistence of shocks. See Online Annex 2.5 for further details on the assumed objective and social welfare functions and other aspects of the dynamic stochastic general equilibrium model. The “Less persistent shock” scenario reduces the half-life of the shock to 6.5 quarters.

the central bank cares only about inflation, it would choose to bring inflation back to target in two years. However, this latter choice entails lower welfare if society in fact values equally both minimal output gaps and inflation target deviations (Figure 2.14, panel 2).²⁷

²⁷The welfare losses clearly depend on the weights that each society would put on inflation target and output gap deviations.

Finally, if there were only forward-looking learners in the economy, then it would be optimal to bring inflation back to target in about three years. Overall, even if the cost-push shock were half as persistent as under the baseline assumptions, it would still be optimal to wait about two years to bring inflation back to target. All these scenarios show that in the presence of a persistent cost-push shock and partially backward-looking expectations, it may be optimal to use a more extended timeline over which inflation is brought to target.

Conclusions

Near-term inflation expectations rose sharply in many economies amid the economic recovery from the pandemic and after the large cost-push shocks of 2022 (from the surprise rises in energy and commodity prices and supply chain disruptions). The rise in expectations was broadly synchronous across professional forecasters, financial markets, households, and firms. In contrast, long-term expectations have remained broadly stable, on average, with no signs of de-anchoring. Past episodes with jointly rising near- and long-term inflation expectations over a sustained period indicate it took about three years on average for inflation and near-term expectations to return to pre-episode levels, although there has been wide variability across episodes.

An estimated hybrid Phillips curve suggests that near-term inflation expectations play a more prominent role in explaining current inflation than long-term expectations. Over recent quarters, the drivers of inflation have shifted from underlying cost-push shocks toward inflation expectations, particularly for the average advanced economy. For the average emerging market economy, expectations play a smaller role than lagged inflation, but still a significant one. This is particularly relevant because the pass-through of expectations to inflation increases when inflation is already elevated, as it is in the present time.

More generally, the analysis underlines the critical role of the expectations formation process for inflation dynamics and the conduct of monetary policy. With a larger share of backward-looking learners in the economy, mean expectations are more persistent and can get stuck at a higher level when inflation is higher for a sustained period. This stickiness reduces the potency of monetary policy and increases the sacrifice ratio (or cost in terms of output forgone) compared with a case in which expectations are purely forward looking.

Given the greater inflation persistence implied by having a share of backward-looking learners in the

economy, it could take up to four years to get inflation back to its target if central banks equally weigh the welfare losses from inflation deviating from target with those from output gaps. If central banks were to disregard the output gap effects of their actions and tighten more and faster, the analysis suggests they could bring inflation back to target in two years, but at the cost of lower output.

Taken together, the chapter's results and recent findings suggest that monetary policymakers benefit from having a clear understanding of the nature of expectations processes at play in their economies. Improved data on expectations could involve close monitoring and enhanced collection of information on expectations across economic agents, particularly near-term expectations which appear more important for current inflation dynamics. The performance of a novel measure of firms' inflation expectations derived from text analysis of firms' earnings calls presented in this chapter points to how technological developments have made it more feasible and cost-effective to extract timely information on expectations.

Improvements to monetary policy frameworks—particularly those that enhance central bank independence and transparency—and communication strategies have the scope to boost the share of forward-looking learners in the economy and thereby the effectiveness of monetary policy (Dincer, Eichengreen, and Geraats 2022). Recent literature suggests that exposure to news improves the precision of perceptions and expectations, increases confidence, and lowers dispersion of beliefs (Lamla and Vinogradov 2019). Haldane, Macaulay, and McMahon (2020) recommend that central bank communications strategies should start with the three Es: explanation, engagement, and education. Focusing on household and firms, other recent contributions suggest addressing inattention by taking account of audience segmentation and using sources of communication that have been identified as most relevant for people with more backward-looking expectations—for example, television in the United States and euro area (see Coibion and others 2020, D'Acunto and others 2020, and Weber and others 2022, among others). They also suggest shaping messages that are simple and repeated often, investing in financial literacy education, emphasizing the goal and not the instruments (for example, former European Central Bank President Mario Draghi's 2012 “whatever it takes” speech), and targeting the message to the conjuncture. These communication strategies can help economic agents become aware of, understand, and internalize the effects of monetary policy decisions.

Box 2.1. Firms’ Inflation Expectations, Attention, and Monetary Policy Effectiveness

The inflation expectations channel can improve when firms pay greater attention to monetary policy and develop a stronger understanding of what it means for their business prospects. However, surveys of firms’ inflation expectations are scarce and time consuming to implement (Coibion and others 2020). This box introduces a new firm-level index of near-term inflation expectations based on text analysis of firms’ earnings calls and presents preliminary findings on how firms’ attention to inflation can influence the effectiveness of monetary policy.

An index of firms’ attention to monetary policy is built in this box using a text analysis of firms’ earnings calls. Details of its construction feature in Albrizio, Dizioli, and Simon (2023) and are similar to those for the firm-level index of inflation expectations, as described in Online Annex 2.6. Specifically, an index for US firms’ attention to the Federal Reserve is constructed based on the frequency of sentences discussing monetary policy in their earnings call transcripts (see Figure 2.1.1 for an aggregate picture).

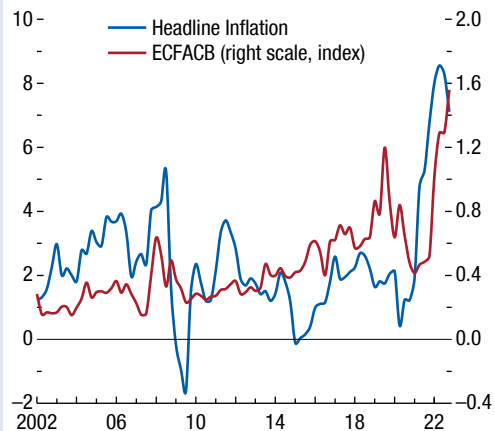
Dynamic responses are estimated using local projections to assess the effect of a monetary policy shock on a firm’s inflation expectations, conditional on the firm’s attentiveness to monetary policy.¹ Attentiveness by firm is de-measured by sectoral average attentiveness in the regression. Because of the de-meaning and the inclusion of time fixed effects, the interaction between the monetary policy shock and attention reflects the marginal effect of monetary tightening on a firm’s inflation expectations from its being more attentive. More attentive firms decrease their inflation expectations by about 1 percent of one standard deviation more than the average after four quarters (Figure 2.1.2).² This corresponds to an amplification of about one-fourth to the sector’s average negative response. The results bolster the chapter’s argument that monetary policy is more effective when monetary policy frameworks and communication strategies help improve agents’ trust in central banks and their understanding of central banks’ monetary policy decisions.

The authors of this box are Silvia Albrizio, Pedro Vitale Simon, and Allan Gloe Dizioli.

¹The specification includes an interaction between a US monetary policy shock measure (from Acosta 2023) and an attention index, firm and time fixed effects, and firm-level controls, based on Ottonello and Windberry (2020). Firm-level controls include sales growth, leverage, employment, total assets, and share of current assets in total assets. Standard errors are two-way clustered by firms and time.

²The shocks have been scaled to have unit standard deviation.

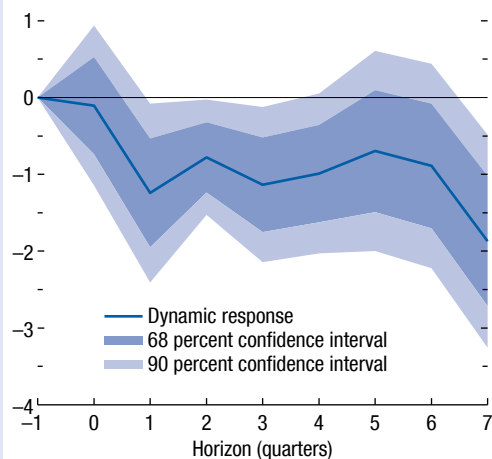
Figure 2.1.1. US Inflation and Firms’ Attention to the Federal Reserve
(Percent, unless noted otherwise)



Sources: NL Analytics; S&P Capital IQ; and IMF staff calculations.

Note: The figure shows an index of firms’ attention to the central bank (right scale), extracted from earnings call transcripts and actual inflation (left scale). The index is calculated by applying text-based analysis using transcripts of US-based companies’ earnings calls and measures the intensity of discussion related to the Federal Reserve. ECFACB = Earnings-Calls-based Firm Attention to the Central Bank index.

Figure 2.1.2. Role of Attention in Monetary Policy Effectiveness
(Percent of ECFIE standard deviation)



Sources: Haver Analytics; NL Analytics; S&P Capital IQ; S&P Compustat; and IMF staff calculations.

Note: The line in the figure is the estimated cumulative impulse response to a one-standard-deviation contractionary monetary policy shock for a firm that is one standard deviation above the average firm attentiveness in its sector. Shaded areas represent 68 (outer) and 90 percent (inner) confidence intervals. ECFIE = Earnings-Calls-based Firm Inflation Expectations index.

Box 2.2. Fiscal Imprudence and Inflation Expectations: The Role of Monetary Policy Frameworks

Fiscal imprudence—high levels of public debt to GDP—is generally regarded as having the potential to generate uncertainty and influence inflation expectations by eroding perceptions of monetary policy credibility and independence.¹ That much has been clear since the work of Sargent and Wallace (1981) and Leeper (1991). This box empirically examines how the level of inflation expectations is related to an economy’s monetary policy framework, given the level of public debt.

In the study presented in this box, the soundness of monetary policy frameworks is captured by a new index, the IAPOC index, developed by Unsal, Papageorgiou, and Garbers (2022).² It shows that even after economy-specific controls and time-invariant characteristics are accounted for, higher public debt is associated with expectations of higher inflation, given a specific level of monetary policy framework (Figure 2.2.1, panel 1).³ This heightened impact is even more evident when the focus is on the stock of public debt in foreign currency and exacerbated when fiscal deficits are persistent (Figure 2.2.1, panel 2). However, as monetary policy frameworks are improved (as seen with the shift in the IAPOC index distribution in emerging market and developing economies over the past 15 years), inflation expectations become less sensitive to the level and composition of public debt or persistent fiscal deficits.

Overall, the study findings indicate that difficulties posed by higher public debt levels for managing inflation expectations in emerging market and developing economies could be eased by adopting strong monetary policy frameworks. Whereas monetary policymaking

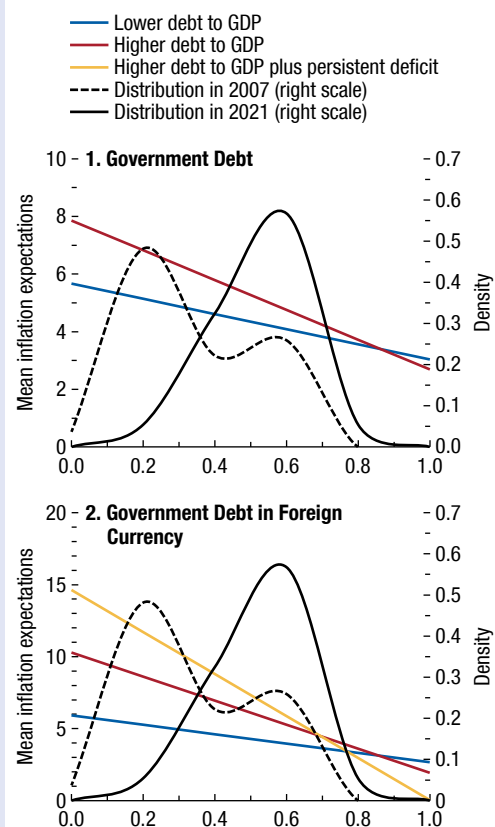
The authors of this box are Omer Akbal, Mariarosaria Comunale, Marina Conesa, Chris Papageorgiou, and Filiz Unsal.

¹See Brandao-Marques and others (2023) for a recent empirical study of the issue and Bianchi and Melosi (2022), Bianchi, Faccini, and Melosi (2022), and Cochrane (2022) for theoretical arguments.

²The IAPOC index and its subindicators quantify the soundness of monetary policy frameworks across countries through three pillars: Independence and Accountability (I and A), Policy and Operational Strategy (P and O), and Communications (C). This comprehensive index enables a multidimensional characterization of monetary policy frameworks—going beyond monetary policy or exchange rate regime classifications—across 13 advanced economies and 37 emerging market and developing economies. See Unsal, Papageorgiou, and Garbers (2022) for further details. The data set has been updated to 2021.

³Advanced economies do not show this differential sensitivity to debt levels over different IAPOC index scores.

Figure 2.2.1. Inflation Expectations in Emerging Market and Developing Economies: Monetary Policy Frameworks and Public Debt Interactions (Percent)



Sources: Consensus Economics; Unsal, Papageorgiou, and Garbers (2022); and IMF staff calculations.

Note: Horizontal axes show the IAPOC index level. The lines show the marginal effects of monetary policy framework changes (according to the IAPOC [Overall Monetary Policy Framework] index) on mean inflation expectations, conditional on the ratio of total (foreign-currency) government debt to GDP. “Higher (lower)” debt is the average debt to GDP, conditional on its being above (below) the sample mean. Estimates are from a fixed-effects panel regression across economies of mean inflation expectations on the interaction of the IAPOC index score and debt to GDP. Distributions represent the density of the IAPOC index for the assessed economies in 2007 (dashed) and 2021 (solid), with a rightward shift indicating improvement.

in many of these economies is better equipped than 15 years ago to serve as an anchor of stability, the adoption of a prudent fiscal policy approach remains key to effective preparation for challenges and to prevent the risk of fiscal dominance in the future.

Box 2.3. Energy Subsidies, Inflation, and Expectations: Unpacking Euro Area Measures

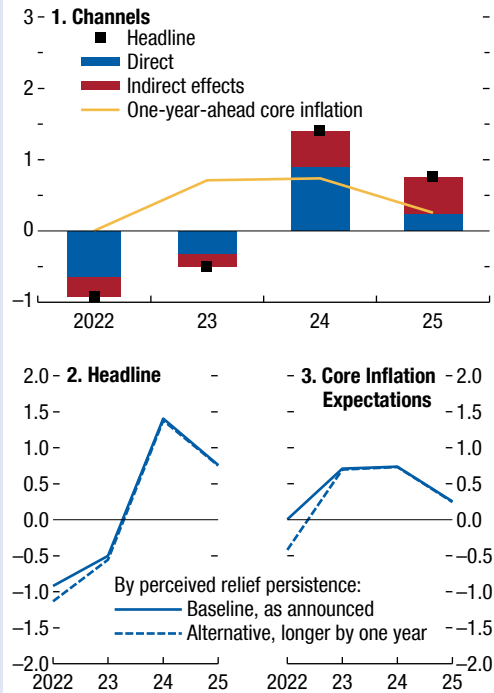
Several European economies have used energy subsidies, tax cuts, and price caps to help smooth the impact of recent shocks to energy prices on incomes and inflation. The effectiveness and desirability of such measures depends on many factors beyond the scope of this box, including their impact on energy markets, resource misallocation, and fiscal sustainability, as well as details of the policy design. One important channel is inflation expectations. Temporary energy subsidies directly lower inflation today but increase it relative to the no-measures scenario after they expire, smoothing the overall inflation path. If energy subsidies are perceived as temporary, the expectations channel may reduce their effectiveness in lowering inflation, as expectations of higher future inflation may affect price-setting today.

A model from the IMF’s Flexible System of Global Models is used in this box to simulate the impacts on expected and realized inflation of announced energy relief measures (price subsidies and caps) in the euro area.¹ The simulation assumes that the sharp upward shock to energy prices in 2022 is temporary and unwinds. It also includes the indirect effects of energy prices on core inflation through the supply chain. The model estimates that fiscal relief measures lowered euro area inflation by 0.9 percentage point in 2022 and by half a percentage point in 2023 (Figure 2.3.1, panel 1). Although additional fiscal borrowing to finance subsidies boosts demand, its effect on core inflation is more than offset by the reduction in supply-chain costs. These fiscal measures smooth out the inflation impact of the energy shock over time, leading to a rise in inflation over 2024–25 (relative to the no-measures scenario) and preventing an undershoot as energy subsidies expire and the energy shock unwinds. The measures have a net neutral effect on core inflation expectations in 2022 but increase them by 0.7 percentage point over 2023–24. These findings assume, however, that agents fully understand the temporary nature of the subsidies. What if agents misperceive and think that the subsidies will last for a year more than announced? In this alternative scenario, expectations fall more in 2022 (Figure 2.3.1, panel 2). Subsidies also lead firms to lower their

The author of this box is Chris Jackson.

¹See Dao and others (2023) for further details on the structure of the model and simulation calibration.

Figure 2.3.1. Marginal Impacts of Fiscal Measures for Relief from the Energy Price Shock on Inflation and Expectations
(Percentage point deviation from no-measures scenario)



Sources: Dao and others (2023); and IMF staff calculations. Note: Panel 1 shows the marginal impacts on inflation of announced fiscal relief measures for energy, using the IMF’s Flexible System of Global Models. The blue bars show the direct effects of measures (subsidies, tax cuts, or price caps on consumer energy prices), and the red bars show the indirect effects from changes in aggregate demand, supply chain costs, and core inflation expectations. The baseline in panel 2 assumes fiscal relief measures last in 2022 as originally announced. The alternative assumes that households misperceive and expect measures will last longer, but then in 2023 they realize their error and adjust to the announced path.

prices by more in 2022, because they now expect core inflation to be lower in 2023. The fall in inflation expectations increases the impact of fiscal policy on inflation from -0.9 to -1.1 percentage points in 2022 and from -0.5 to -0.6 percentage point in 2023. But once agents realize their error and correct, inflation and expectations bounce back, highlighting the role of the expectations channel.

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Russia's invasion of Ukraine in 2022 caused major commodity markets to fragment, and continued geopolitical tensions could make matters worse. This chapter examines the key channels through which further disruptions in commodity trade could affect prices, economic activity, and the clean energy transition. It finds that commodity markets are particularly vulnerable in the event of fragmentation. Commodity production is often highly concentrated because of natural endowments, and many commodities are difficult to substitute in the short term. Further fragmentation of commodity markets—which had been on the rise even before the war in Ukraine—could cause large price changes and more price volatility. Model simulations suggest that trade disruptions could result in substantial economic impacts in commodity-dependent economies. However, due to offsetting effects across producing and consuming countries, global economic costs appear modest. Crucially, low-income countries with a high reliance on agricultural imports would be disproportionately affected, raising food security concerns. The fragmentation of mineral markets could also make the clean energy transition more costly and lead to lower-than-needed investment in renewable energy and electric vehicles. Taken together, the findings present yet another argument for multilateral cooperation on trade policies. At the very least, agreements on a “green corridor” for critical minerals and a “food corridor” would safeguard the global goals of averting climate change and food insecurity.

Introduction

Since the end of the Cold War, primary commodity markets have become more integrated as a result of trade liberalization, technological innovation,

The authors of this chapter are Jorge Alvarez (co–team lead), Mehdi Benatiya Andaloussi, Christopher Evans, Chiara Maggi, Marika Santoro, Alexandre Sollaci, and Martin Stuermer (co–team lead), with contributions by Marijn Bolhuis, Jiaqian Chen, Benjamin Kett, Seung Mo Choi, Peter Nagle, and Alessandra Sozzi, and under the guidance of Petia Topalova. Yarou Xu, Carlos Morales, and Canran Zheng provided outstanding research assistance. Andrei Levchenko was the external consultant. The chapter also benefited from discussions with Thibault Fally, Julien Martin, James Sayre, David Shin, and John Sturm as well as from comments by internal seminar participants and reviewers. We are grateful to Naomi Idoine and her colleagues from the British Geological Survey for guidance on data.

and declines in transportation costs. Integrated commodity markets have provided cheap inputs that have supported global growth and so have helped raise living standards, especially in emerging markets.¹

However, the war in Ukraine put this process in reverse. For the first time since the 1970s, commodities such as crude oil, natural gas, and wheat were broadly used to exert pressure in a major conflict. Exports were restricted and countersanctions imposed. These disruptions in commodity trade contributed to surging inflation in 2022 in many parts of the world, food insecurity in low-income countries, and slower global growth (IMF 2023).

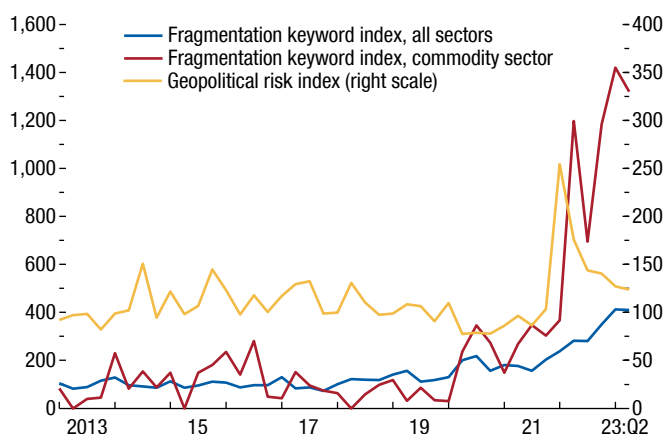
While most commodity prices have since normalized, geopolitical tensions signal that more severe fragmentation of commodity trade is a major risk.² Many countries are trying to reshore commodity supply chains for national security, geopolitical, or other reasons. Measures include those for critical minerals for clean energy technologies, semiconductors, and defense (examples of actions are the US Inflation Reduction Act, the European Chips Act, and China's export restrictions on gallium and germanium).

As a result, concerns about fragmentation, deglobalization, and nearshoring have risen sharply, especially in the commodity sector (Figure 3.1). Text mining analysis of earnings calls reveals that prior to the COVID-19 pandemic, firms barely mentioned keywords related to fragmentation, but usage surged after Russia's invasion of Ukraine.

¹Economic theory suggests that the consumption gains and the more efficient use of resources generated by trade should boost GDP. See Feyrer (2019, 2021) for recent analysis and Irwin (2019) for a review of the literature on trade and growth.

²Building on Aiyar and others (2023), the chapter defines geo-economic fragmentation (referred to as “fragmentation” for brevity in the rest of the chapter) as any policy-driven reversal of integration, including reversals guided by strategic considerations such as national security. It encompasses trade, fiscal and financial measures such as tariffs, export restrictions, subsidies, and restrictions on payments. The trade literature of the early 2000s used “fragmentation” to describe the geographic dispersion of production processes in globally integrated supply chains (Arndt and Kierzkowski 2000; Deardorff 2001).

Figure 3.1. Fragmentation Keywords in Earnings Calls
(Indices, 2013–15 = 100)



Sources: Caldara and Iacoviello (2022); Hassan and others (2019); NL Analytics, Inc.; and IMF staff calculations.

Note: Fragmentation indices measure the average number of sentences, per thousand earnings calls, that mention at least one of the following keywords: *deglobalization*, *reshoring*, *onshoring*, *nearshoring*, *friend-shoring*, *localization*, *regionalization*.

There is little consensus on the economic costs of fragmentation in the fast-growing literature. Estimates of long-term output losses from restricting the international flow of goods and services, finance, and technology range from 0.2 percent to 12 percent of global GDP, depending on the scenario and assumptions.³ Commodity markets could be another important channel through which further disruptions in trade affect activity. Commodity production is hard to relocate, as it is linked to natural endowments such as geological deposits or soil quality. Consumption of commodities is often difficult to substitute in the short term. Moreover, many commodities are crucial inputs for manufacturing and technologies, including those related to the clean energy transition.

Against this backdrop, the chapter studies the main channels through which further fragmentation

³See Aiyar and others (2023) for an overview of potential channels of impact. Recent studies that quantify aggregate losses from restricting trade include Albrizio and others (2023); Attinasi, Boeckelmann, and Meunier (2023); Bolhuis, Chen, and Kett (2023); Fally and Sayre (2018); Felbermayr, Mahlkow, and Sandkamp (2022); Hakobyan, Meleshchuk, and Zymek (2023); and Javorcik and others (2022). Chapter 4 of the April 2023 *World Economic Outlook* examines the consequences of restrictions on investment, and Chapter 3 of the April 2023 *Global Financial Stability Report* does the same for portfolio flows, whereas Cerdeiro and others (2021) and Góes and Bekkers (2022) quantify the losses once technological decoupling is also considered.

of markets for energy, agricultural, and mineral commodities could affect economies and global public goods—namely, the energy transition. It focuses on the following questions:

- What makes commodity markets vulnerable in the event of fragmentation?
- Is there fragmentation in commodity markets, and if so, what form does it take?
- Which commodities are most vulnerable to disruptions in international trade?
- What would be the economic impact of commodity market fragmentation across blocs and countries, as well as on the global economy?
- What might be the implications of such fragmentation for the clean energy transition?

The chapter covers nearly all countries and focuses on 48 commodities, including agricultural goods, energy commodities—namely, coal, crude oil, and natural gas—and other mineral commodities. It builds a unique database of commodity output, use, and bilateral trade, and employs a combination of descriptive statistics, empirical analysis, and model simulations.

The chapter simulates a highly stylized risk scenario, in which commodity trade between two geopolitical blocs is persistently disrupted, to illustrate the channels through which commodity market fragmentation could affect prices and output. The main scenario defines the two theoretical blocs by using the 2022 United Nations (UN) vote on the war in Ukraine as a transparent starting point. However, the chapter examines alternative scenarios, including the role of neutral countries and the impact of countries' switching blocs, given the sensitivity of the analysis to bloc configurations and the difficulty of assessing bloc configurations' plausibility.⁴

⁴Countries' geopolitical alignment could be partly driven by trade linkages and risk management strategies to reduce the fallout from spikes in geopolitical tensions. However, the endogenous formation of blocs remains beyond the scope of the chapter. The two-bloc scenario presented here is meant to provide a clearly defined baseline and to make the exercise comparable to those in the recent literature. Introducing neutral countries reduces the impact of fragmentation, as discussed later in the chapter.

Online Annex 3.1 provides details on the commodities and countries and their allocation across blocs as well as data sources. Online Annex 3.5.2 discusses the robustness of some of the key findings to different bloc configurations. All online annexes are available at www.imf.org/en/Publications/WEO.

The main findings are as follows:

- *Commodities are vulnerable in the event of fragmentation.* The importance of natural endowments for production can lead to high geographic concentration of output. For example, the three biggest suppliers of minerals account for about 70 percent of global production, on average. Coupled with low demand elasticities and their upstream use in many manufacturing processes and key technologies, this means that commodities are highly traded. However, many importers rely on just a few suppliers. These features raise the cost of trade disruptions.
- *There is rising fragmentation in commodity markets.* Measures restricting commodity trade surged in 2022, much more than those restricting trade in other goods. For selected commodities, price differentials across geographic markets have widened. And commodity sector foreign direct investment (FDI) and cross-border mergers and acquisitions were on the decline even prior to the war in Ukraine.
- *Fragmentation could cause large price changes.* The scale of the price effects depends on the supply-and-demand imbalances caused by fragmentation and the price elasticities of supply and demand. Illustrative partial equilibrium model simulations suggest that price effects could be particularly strong for some minerals critical for the green transition and some highly traded agricultural goods. Spikes in agricultural commodity prices could be concerning for many low-income countries reliant on imports to feed their population.
- *Fragmented commodity markets would also lead to higher price volatility.* Smaller markets in a fragmented world would provide fewer buffers against commodity supply and demand shocks, leading to larger price responses than under free trade. Moreover, commodity producers would have powerful incentives to switch allegiances given potentially significant differences in commodity prices among blocs. This would induce more supply shocks, volatility, and uncertainty in commodity markets, challenging fiscal, monetary, and financial stability.
- *For many commodity-dependent economies, fragmentation would lead to sizable macroeconomic impacts.* For some low-income countries and emerging market economies, illustrative trade model simulations point to long-term output losses exceeding 2 percent.

Due to vastly different and often offsetting impacts across net commodity-producing and net commodity-consuming countries, however, economic losses appear relatively modest at the global level. This should not lead to complacency: the chapter quantifies only the restriction of commodity trade between blocs. Should the world fragment into isolated blocs, the flows of other goods and services, finance, technology, and know-how would most likely also be disrupted, amplifying global economic costs (Aiyar and others 2023). The higher volatility and uncertainty brought on by commodity market fragmentation would complicate policymaking and add to costs, a channel that is also not captured. Moreover, within countries, offsetting effects on commodity consumers and producers imply strong distributional impacts even absent large aggregate output effects. Fragmentation in agricultural commodity markets could raise food insecurity in low-income countries, with high social and humanitarian costs that are not included in the chapter's model simulations. In sum, commodity market fragmentation could deliver a sizable economic blow in an already challenging environment of slow global growth, tight financial conditions, and high debt in many vulnerable countries.

- *Fragmentation in mineral markets could make the clean energy transition more costly.* Demand for critical minerals is projected to rise severalfold in a net-zero-carbon-emissions scenario. These minerals are highly concentrated geographically, and their elasticities of demand and supply are low, so trade disruptions could add to upward pressure on mineral prices in the bloc where demand exceeds supply after fragmentation. But the mineral-rich bloc cannot reap the benefits from oversupply, as refining capacity cannot be scaled up quickly. In the illustrative simulation, fragmentation results in up to 30 percent lower-than-needed investment in renewables and electric vehicles (EVs) at the global level by 2030.

What Makes Commodities Vulnerable in the Event of Fragmentation?

This section documents several features of commodity markets that would raise the economic costs of disrupting their trade, despite commodities' homogeneity and fungibility.

Production Concentration

The first production stage of commodities depends on natural endowments, which can be heavily concentrated geographically. For instance, the extraction of minerals and energy commodities requires cost-effective geological deposits. Availability of fertile soil, water, and an adequate climate can constrain agricultural production and yields. As a result, the three largest-producing countries account for about 65 percent of the global output of agriculture, about 50 percent of that of energy, and about 70 percent of that of mineral commodities on average (Figure 3.2, panel 1).⁵

Minerals represent a special case: production is concentrated both at the first stage (mining) because of the geographic concentration of deposits, and also at the second (processing) stage. Relocating production at the mining stage may be impossible over the short and medium term, given the importance of natural endowments.

Elasticities of Supply and Demand

The price elasticity of supply, which measures how output responds to price changes, is relatively low for commodities in the short term (Figure 3.2, panel 2). Scaling up production requires large investments, environmental permitting, and community consultations that can delay a supply response to price changes. For example, it takes on average 16 years from exploration to the opening of copper mines (IEA 2021). Discovering new deposits is also costly and takes time.⁶

⁵The chapter focuses on countries and not firms. Commodity extraction is often undertaken by multinationals or firms owned by foreign investors (Leruth and others 2022). Firm-level concentration could be different from country-level concentration. However, governments are typically the ultimate owners of land or reserves and lease them to firms for a limited time. Renegotiations of lease terms as well as expropriations are common (Jaakkola, Spiro, and Van Benthem 2019). The chapter also focuses on production rather than reserves owing to lack of data availability. Reserves and production are highly correlated (USGS 2023).

Online Annex 3.2 provides the production and import concentration and the share of trade in output for the commodities. Concentration of production is also apparent at the firm level, with a few countries taking stakes in key firms (Leruth and others 2022).

⁶Elasticities below 1 are generally considered low. See Fally and Sayre (2018) and Dahl (2020) for a literature review on supply and demand elasticities across commodities. Arezki, van der Ploeg, and Toscani (2019) analyze the responsiveness of resource discoveries to market incentives. It is worth noting that the sizable investments needed to expand the supply of commodities may be hindered by the disruptions in external capital flows and higher uncertainty that geoeconomic fragmentation might trigger, as discussed in the April 2023 *World Economic Outlook* and April 2023 *Global Financial Stability Report*.

Setting up processing capacity comes with its own challenges, such as regulations; access to know-how, technology, and skilled labor; infrastructure requirements; and labor costs (IEA 2023). These help explain the geographic concentration at the refining and processing stages.

On the demand side, many commodities are inputs for key technologies and products or are essential to household consumption (food, heating, cooking, and transportation are examples). Disruptions to their supply can cause ripple effects across sectors and value chains. As upstream inputs for the production of a vast array of goods and services (Figure 3.2, panel 3), they are often hard to substitute, and demand responds little to swings in prices. This is reflected in their low price elasticity of demand, particularly in the short term.

Importance of Trade

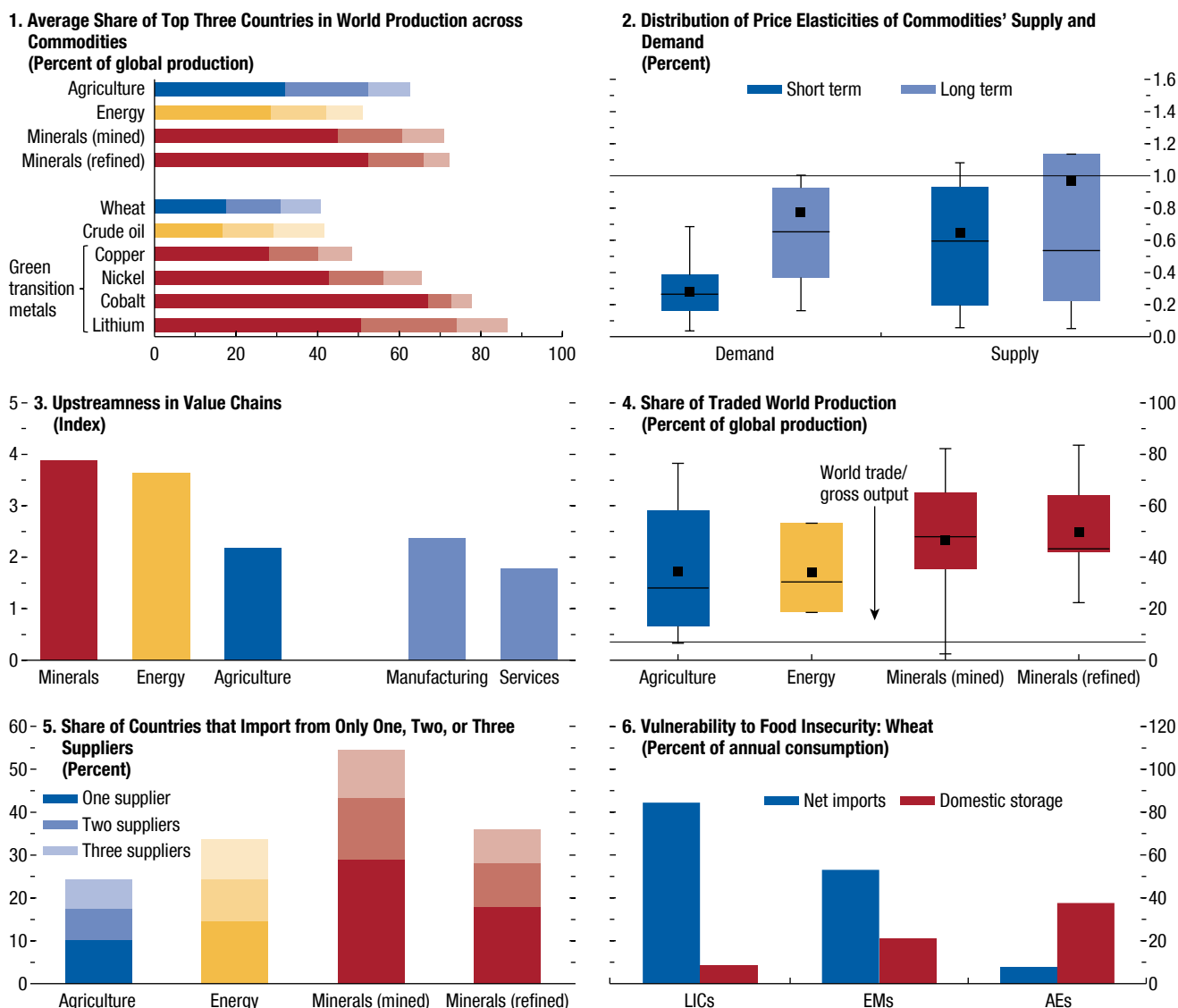
With production highly concentrated and demand often broadly spread across countries, commodities are heavily traded. Their homogeneity and fungibility—despite low demand and supply elasticities, commodities have a high elasticity of substitution across suppliers—also contribute to market integration. The share of production traded internationally is higher for most commodities than the ratio of world trade to gross output (Figure 3.2, panel 4). On average across agricultural and energy commodities, about 30 percent of output is dedicated to trade and about 45 percent for minerals, with the shares substantially higher for many commodities.⁷

As a result, imports satisfy a large part of the demand for commodities. However, many countries depend on only a handful of suppliers (Figure 3.2, panel 5). For example, roughly half of the world's countries rely on three or fewer exporting countries for their imports of minerals, and a quarter on only one. This leaves them vulnerable to supply disruptions in the near term.⁸

⁷Even though commodities are heavily traded, their share in global trade has declined as trade liberalization, lower transportation costs, and cross-border production chains have supported the rapid rise in intermediate-goods trade. The share of primary goods in total goods trade declined from roughly 45 percent in the first half of the 20th century to about 13 percent in 2019–21 (Online Annex Figure 3.2.4).

⁸Historically, countries were often able to adapt to trade disruptions over the medium to long term by finding alternative suppliers, because of commodities' homogeneity, or by developing substitutes (see Box 3.2).

Figure 3.2. Commodities: Key Characteristics

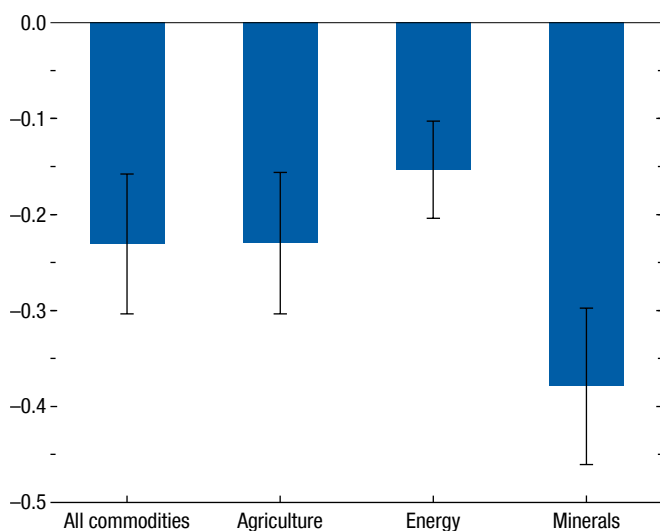


Sources: Antràs and others (2012); British Geological Survey; Dahl (2020); Fally and Sayre (2018); Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); International Energy Agency; US Department of Agriculture; US Geological Survey; and IMF staff calculations. Note: "Energy" refers to coal, natural gas, and crude oil. This figure uses 2019 data due to data availability and to avoid biases caused by the pandemic. Panel 1 provides the share of global production that the top three producing countries account for (see Online Annex Figure 3.2.2) and gives averages across commodity types. In panels 2 and 4, the horizontal lines in the bars represent the median, the squares the average, the bars the interquartile range, and the whiskers the minimum and maximum values across commodities in the group. In panel 3, sectoral upstreamness is based on Antràs and others (2012) and is computed as the weighted average position of an industry's output in the value chain. The upstreamness index captures how far a specific sector is from the final end usage, with a lower index value (minimum value of 1) implying that the sector is closer to final demand. Panel 4 does not include palladium and platinum due to data quality. Panel 5 depicts the simple average across commodities of each group. Panel 6 depicts the simple average across countries within each income group, for 2019. AEs = advanced economies; EMs = emerging markets; LICs = low-income countries.

Import dependence in agricultural commodities can lead to food insecurity in case of trade disruptions, particularly in low-income countries. For instance, the average low-income country imports more than 80 percent of the wheat it consumes. Given low storage capacity, consumption smoothing can be difficult in these countries, exposing

populations to large swings in prices or food shortages (Figure 3.2, panel 6). The ramifications of food commodity shocks, which have been linked to social unrest, conflict, and migration (Kelley and others 2015; Missirian and Schlenker 2017; Burke and McGuirk 2020), go beyond the economic analysis that follows.

Figure 3.3. Commodity Trade and Distance of Military Alliances
(Coefficients)



Sources: Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); Leeds and others (2002); Signorino and Ritter (1999); and IMF staff calculations.

Note: “Energy” refers to coal, natural gas, and crude oil. The bars in the figure denote the point estimates, and the vertical lines represent 95 percent confidence intervals. Standard errors are clustered at the importer country level. Estimates are based on an inverse hyperbolic sine specification to account for zeros. Distance of military alliances is measured using the similarity between countries’ portfolios of military alliances and standardized so its standard deviation is 1 in each year. A standardized military distance of 1 is approximately the distance between India and Morocco in 2018.

Sensitivity to Geopolitics

Analysis of trade patterns suggests that commodity trade is historically associated with countries’ geopolitical alignment. Gravity equations, estimated for the commodities in the sample and augmented to include the similarity between countries’ portfolios of military alliances, show that bilateral commodity trade flows are negatively associated with military distance (Figure 3.3).⁹ However, notable differences are apparent in the strength of the relationship across types of commodities: a one-standard-deviation increase in the distance of military alliances (approximately the distance between India and Morocco in 2018) is

⁹The gravity model is widely used to explain bilateral trade flows based on country and country pair characteristics that capture trading costs, such as geographic distance or a common border, language, or currency. Online Annex 3.3 provides details and robustness checks. Distance in military alliances is associated with lower trade in minerals across specifications. The results are more sensitive for other measures of geopolitical alignments, namely, the ideal point distance based on UN votes, used in Chapter 4 of the April 2023 *World Economic Outlook* in a similar analysis for FDI flows (see also Jakubik and Ruta 2023). Hakobyan, Meleshchuk, and Zymek (2023) examine distance in military alliances and sectoral trade flows.

associated with a decrease in trade in energy commodities by about 15 percent but it is associated with a more than 35 percent decline in minerals trade. The exercise suggests that changes in military alliances because of rising geopolitical tensions could go hand in hand with disruptions of trade flows and fuel fragmentation of commodity trade.

Fragmentation in Commodity Markets

This section takes stock of various measures of fragmentation. The number of new interventions in commodity trade has risen every year since 2018, with the increase initially fueled by tensions between China and the United States and the COVID-19 pandemic. In 2022, Russia’s war in Ukraine caused a major spike in new trade restrictions for commodities: there were more than six times more new restrictions affecting trade in commodities in 2022 than the 2016–19 average. In contrast, trade-restricting measures on overall trade increased 3.5 times (Figure 3.4, panel 1).¹⁰

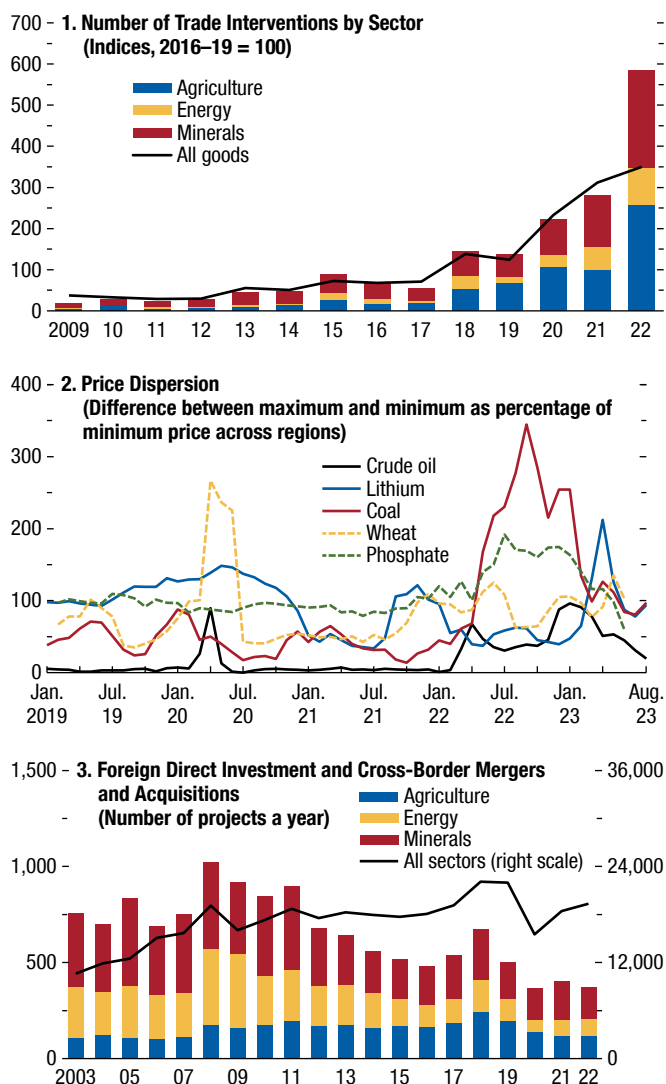
Price dispersion across locations can also be a symptom of fragmentation: as commodities are homogeneous goods, they should trade under one price after transportation costs are accounted for. However, price dispersion increased in major commodity markets in 2022, especially in those for some minerals, such as lithium, and energy commodities (Figure 3.4, panel 2). For example, Russian coal traded at a price almost three times lower than Australian coal in September 2022. Price dispersion for crude oil and natural gas also rose as the war in Ukraine and associated sanctions disrupted trade. Box 3.1 documents shifts in trade flows using real-time vessel-tracking data.

Other proxies for fragmentation are changes in the number of FDI projects and cross-border mergers and acquisitions, which are also indicators of future trade. They were declining in the energy and mineral sectors even before the war in Ukraine, which could presage a slowdown in commodity trade (Figure 3.4, panel 3).¹¹ Shifts have also occurred in the origin and destination

¹⁰Trade interventions in the Global Trade Alert database, the source for the data in Figure 3.4, panel 1, include both measures that increase fragmentation, such as import tariffs and export restrictions, and measures that aim to limit the economic fallout from fragmentation by encouraging diversification, such as subsidies for local producers, local-content requirements, and the like—although a strict distinction between the two is difficult.

¹¹Following Chapter 4 of the April 2023 *World Economic Outlook*, the analysis focuses on the number rather than the value for FDI and cross-border mergers and acquisitions. Data on values are limited and often estimated. However, FDI values suggest a similar decline in the commodity sector.

Figure 3.4. Signs of Fragmentation



Sources: Argus Media, Inc.; Bloomberg Finance L.P.; FDI Markets; Global Trade Alert database; Refinitiv Eikon; UN Comtrade; and IMF staff calculations. Note: Policy interventions are adjusted for reporting lags, and trade-liberalizing interventions are excluded from calculations. Prices for crude oil, coal, and lithium are market prices in different regional markets as retrieved from Bloomberg Finance L.P. Wheat and phosphate price dispersion is estimated based on export prices for countries that account for more than 5 percent of global exports, based on export data from UN Comtrade. Panel 3 presents the total number of foreign direct investment and cross-border mergers and acquisitions projects at the global level. The bars provide a breakdown by commodity group.

of commodity FDI and cross-border mergers and acquisitions. US and EU investors are increasingly targeting projects in advanced economies, whereas China and Russia have increased their investments in Africa (see Online Annex Figure 3.2.5).¹²

¹²Chapter 4 of the April 2023 *World Economic Outlook* documents FDI flows are increasingly concentrated among geopolitically aligned countries, particularly in strategic sectors.

No measure of fragmentation is perfect. It is still too early to assess how long-lasting price dispersion will be. The decline in FDI could reflect moderation in commodity prices since 2015, following the decade-long commodity boom, and it is not clear, on account of lagging data, to what extent trade-restricting measures have affected trade flows (Goldberg and Reed 2023). However, taken together, these measures suggest rising commodity market fragmentation.

Which Commodities Are Most Vulnerable?

To assess individual commodities' vulnerability in the event of fragmentation, this section presents results from a single-commodity, multicountry partial equilibrium model based on Alvarez and others (2023) (see also Online Annex 3.4 for details). It computes price changes that would occur if trade for each of the 48 commodities included in the analysis were banned across two blocs.

For illustrative purposes, the main scenario assumes that the two theoretical blocs are constructed based on the 2022 UN vote on Russia's war in Ukraine. The bloc comprising countries that voted for Russia to withdraw from Ukraine is labeled the "US-Europe+ bloc"; the remaining countries are in the "China-Russia+ bloc."¹³ The exercise assumes, in a highly stylized and extreme way, that there is no trade in a particular commodity between blocs, whereas intrabloc trade of the commodity is unaffected. Box 3.2 discusses more fluid experiences of fragmentation; investigating the impacts of those intermediate scenarios is beyond the scope of the chapter. Rather, the chapter's goal is to identify relative vulnerabilities across commodity markets and to illustrate transmission channels, with the recognition that partial interactions between blocs and arbitrage opportunities could mute the economic effects implied by the model simulations.

For each commodity, the model's initial calibration is based on observed 2019 trade flows. They are assumed to reflect an integrated world, where goods are traded at one global price.¹⁴ The trade ban across

¹³See also Chapter 3 of the October 2022 *Regional Economic Outlook: Asia and Pacific*. More details on the countries in each bloc and sensitivity checks for other bloc configurations are in Alvarez and others (2023) and Online Annexes 3.1.2 and 3.5.2.

¹⁴The assumption of perfect trade integration in the baseline oversimplifies reality, as markets for some commodities were not perfectly integrated globally even before the war in Ukraine.

blocs yields bloc-specific prices that clear bloc-level supply and demand.

Fragmentation would induce opposite price effects across blocs. The price of a commodity falls in the bloc that used to be a net exporter of that commodity and increases in the net importing bloc. The size of price changes depends on (1) bloc-level supply-and-demand imbalances prior to fragmentation—that is, the extent to which a bloc relies on imports to satisfy its demand at the integrated world price—and (2) the capacity of demand and supply to respond to changing prices (the price elasticities of demand and supply). Commodities with inelastic demand and supply and with high imbalances across blocs are more vulnerable to price changes.¹⁵

Model simulations suggest that the potential price impact of fragmentation would vary significantly across commodities, with some potentially experiencing very large price increases (Figure 3.5; see Online Annex Figure 3.5.1 for the underlying commodity-specific results).¹⁶ In the China-Russia+ bloc, the price of mined minerals, including cobalt, lithium, copper, and nickel, which are critical for the green transition, would rise substantially. Production of these minerals would be concentrated in a handful of countries in the US-Europe+ bloc, but they are largely used as inputs in the China-Russia+ bloc (see Online Annex Figure 3.2.6). At the same time, the US-Europe+ bloc could experience similar increases in the prices of refined minerals, which are processed mostly in China, Russia, and South Africa.

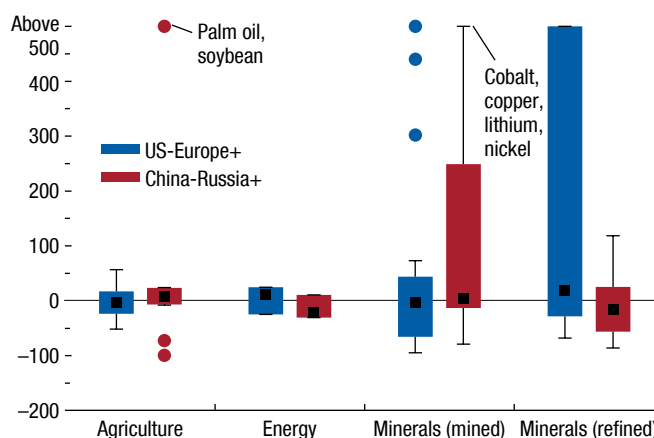
In contrast, the potential price changes for energy and most agricultural commodities are more subdued in the main simulation. Since the production of these commodities is less geographically concentrated, supply and demand are more balanced across the two blocs. However, palm oil and soybean represent two important outliers: more than 80 percent of production would occur in the US-Europe+ bloc, whereas most of the consumption would take place in the China-Russia+ bloc.

Because of high geographic concentration, the vulnerability of commodities in the event of fragmentation depends on the distribution of key exporters (and importers) across blocs. Simulations based on different

¹⁵The exercise does not explicitly model storage, which is an important feature of volatility smoothing. See among others, Williams (1936), Gustafson (1958), and Wright and Williams (1982). Carter, Rausser, and Smith (2011) provide a literature review.

¹⁶The following partial equilibrium results are based on Alvarez and others (2023).

Figure 3.5. Price Changes Due to Fragmentation in Individual Commodity Markets (Percent)



Sources: British Geological Survey; Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); International Energy Agency; United States Geological Survey; and IMF staff calculations.

Note: Price effects are capped at 500 percent for readability. “Energy” refers to coal, natural gas, and crude oil. The black squares in the bars represent the median; the bars, the interquartile range; and the whiskers, the data points within 1.5 times the interquartile range from the 25th or 75th percentile across commodities in the group. The dots indicate outliers. Selected commodities which experience price increases higher than 500 percent are labeled. For the underlying complete information on commodity-specific price changes, see Online Annex Figure 3.5.1. The bloc including the countries that voted for Russia’s withdrawal from Ukraine in the 2022 UN vote is labeled the “US-Europe+ bloc,” and the remaining countries are included in the “China-Russia+ bloc.”

country compositions of the two hypothetical blocs, described in Online Annex 3.5.2, suggest that, in a way similar to what occurs in the main simulation, fragmentation would lead to significant price increases for minerals at the mining stage and for key agricultural staples (such as soybeans) in the China-Russia+ bloc. In an alternative bloc scenario, in which all emerging market and developing economies, excluding India, Indonesia, and Latin American countries, are assigned to the China-Russia+ bloc, the US-Europe+ bloc could experience large price increases for some minerals. This is because key producers are allocated to the other bloc. It could also become more vulnerable in case of trade restrictions on some agricultural commodities (such as cocoa) and crude oil.

Higher Commodity Price Volatility

Fragmented commodity markets would lead to higher price volatility (see Jacks, O’Rourke, and Williamson 2011, for historical evidence). This would challenge public finances and fiscal and monetary frameworks, giving rise to potential procyclicality of fiscal and monetary policies and hurting economic

stability (Cavalcanti, Mohaddes, and Raissi 2015; IMF 2023). Fragmentation can affect price volatility through at least two channels: smaller market sizes and countries switching blocs.¹⁷

Smaller Market Sizes

In a fragmented world, markets would become smaller and bloc-level prices more responsive to country-level shocks (see also Albrizio and others 2023). In the partial equilibrium model, the price response is proportional to the supply shock's size relative to the overall market. Thus, by restricting the set of countries with which they trade, countries would face larger price increases in response to the same negative supply shocks.¹⁸ In an illustrative example, Figure 3.6 compares the price impact of a three-standard-deviation shock to the US wheat harvest in an integrated market with that in a fragmented market.¹⁹ The same supply shock doubles the impact on wheat prices when trade is fragmented into two smaller blocs. This is important, as climate change is expected to raise the variability of agricultural output. A fragmented world, in which the price response to supply shocks is amplified, would be less able to cope with this challenge.

Countries Switching Blocs

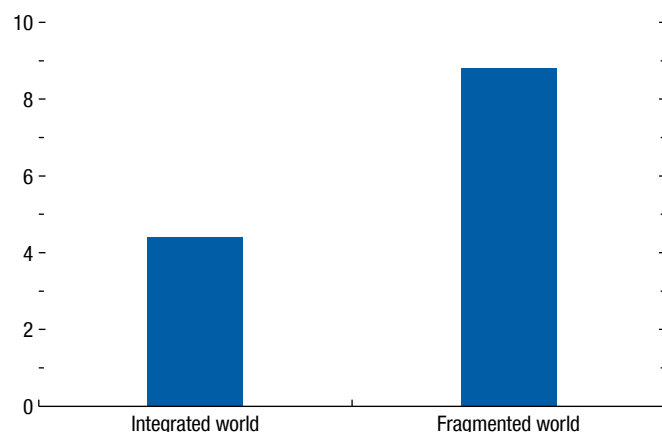
In a fragmented world, major commodity producers would face powerful incentives to switch geopolitical allegiances, with such switching representing a new source of supply shocks and price volatility. For highly concentrated commodity markets, a single exporting country switching to the other bloc could lead to a large supply gap and trigger hefty price changes. Uncertainty about a country's geopolitical alignment could itself lead to price volatility as traders update their priors regarding potentially large fragmentation-induced price swings.

¹⁷Other channels could include the impact on the financial ecosystem linked to commodities, such as derivatives and insurance (FSB 2023).

¹⁸In the single-commodity model, the price change in response to a supply shock is $Price\ Change = -\frac{Size\ of\ Supply\ Shock\ Relative\ to\ Market}{Elasticity\ of\ Supply - Elasticity\ of\ Demand}$, with $Elasticity\ of\ Demand < 0$ (Alvarez and others 2023).

¹⁹The United States accounts for about 7 percent of global and 15 percent of US-Europe+ bloc wheat production. A three-standard-deviation US harvest shock corresponds to about 60 percent of US wheat production, or 4 percent of global output, with wheat prices held constant. The exercise uses a price elasticity of supply of 0.2 and a price elasticity of demand of -0.85 (see Alvarez and others 2023). Lower elasticities would lead to higher price impacts, and fragmentation would still double the price impact in this example.

Figure 3.6. Wheat Price Increase in the US-Europe+ Bloc due to a Harvest Shock (Percent)



Sources: Food and Agriculture Organization of the United Nations; and IMF staff calculations.

Note: The bars in the figure depict the change in the price of wheat in the US-Europe+ bloc (those countries that voted for Russia to withdraw from Ukraine in the 2022 UN vote on the Ukraine war) from a three-standard-deviation negative shock to US wheat production. The figure compares the price increases in the bloc in a free-trade world to those in a fragmented world.

To illustrate price sensitivity to countries switching blocs, Figure 3.7 shows the distribution of the greatest price increases each commodity can experience in a bloc when a single exporting country switches its alliance.²⁰ Minerals at the mining stage tend to be the most sensitive, given their highly concentrated production. For example, South Africa produces one-third of the world's manganese, a metal used in steelmaking and batteries. If South Africa switched to the US-Europe+ bloc, the price of manganese in the China-Russia+ bloc could rise more than 800 percent.

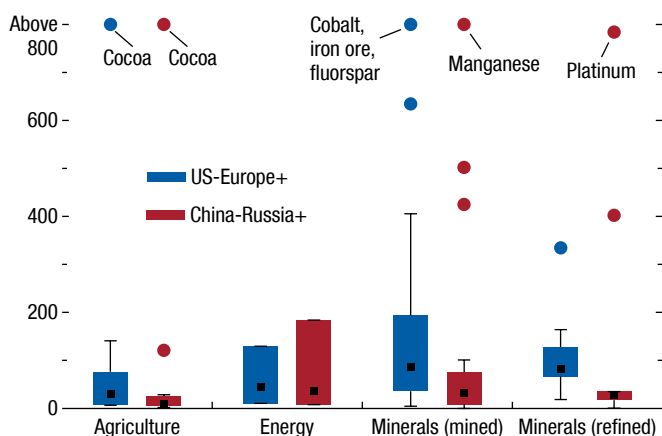
Economic Impacts of Commodity Market Fragmentation

This section sheds light on the macroeconomic impacts of fragmenting commodity markets on individual economies, blocs, and the global economy. Three complementary analytical approaches are used.²¹

²⁰These results are based on Alvarez and others (2023). Online Annex Figure 3.5.2 zooms into the results in Figure 3.7 by showing the 15 commodities whose prices are most vulnerable to a single exporter switching blocs and the implied price changes.

²¹Online Annexes 3.4–3.6; Alvarez and others (2023); and Bolhuis, Chen, and Kett (2023) discuss the assumptions, calibration, and additional results of each model. None of the approaches consider the impact of fragmentation on productivity and innovation. The role of the financial sector is also outside of the scope of the chapter.

Figure 3.7. Largest Price Increases Induced by a Single Exporter Switching Blocs
(Percent)



Sources: British Geological Survey; Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); International Energy Agency; United States Geological Survey; and IMF staff calculations.

Note: Price effects are capped at 800 percent in the figure for readability. “Energy” refers to coal, natural gas, and crude oil. Each observation in the box plots represents the largest price increase that a commodity can experience in each bloc from a single exporting country’s switching to the other bloc. Note also that the US (China) is not allowed to switch away from the US-Europe+ (China-Russia+) bloc. The black squares in the bars represent the median; the bars, the interquartile range; and the whiskers, the data points within 1.5 times the interquartile range from the 25th or 75th percentile across commodities in the group. The dots indicate outliers; the commodities representing the largest outliers are labeled. For the underlying complete information on commodity-specific price changes, see Online Annex Figure 3.5.2. The bloc including the countries that voted for Russia’s withdrawal from Ukraine in the 2022 UN vote is labeled the “US-Europe+ bloc,” and the remaining countries are included in the “China-Russia+ bloc.”

First, the partial equilibrium model discussed earlier is leveraged to compute changes in producer and consumer surplus due to fragmentation in individual commodity markets. The resulting change in total surplus is used as an indicator of economic impact. This approach identifies the most macro-relevant commodities. It accounts for the changes in price and quantities consumed or produced of each commodity because of fragmentation. However, due to its partial equilibrium nature, the approach does not account for sectoral spillover effects, nor does it allow for the simultaneous disruption of trade in many commodities, which could have opposing or reinforcing effects within the same country.

Two general equilibrium models in the chapter overcome these shortcomings. A static multicountry, multisector trade model, which accounts for all input-output linkages across sectors, is used to simulate the long-term GDP losses associated with

fragmenting all commodity trade and to examine the role of neutral blocs (see Box 3.3). Finally, the dynamic effects on GDP and inflation are examined in a multiregion dynamic stochastic general equilibrium model that includes energy and critical minerals.

Evidence from the Partial Equilibrium Model

Several findings emerge from the partial equilibrium approach. First, inefficiencies associated with restricting trade result in losses in bloc-level total surplus: the global economy is worse off from the fragmentation of trade in individual commodities (see Figure 3.8, panel 1).²²

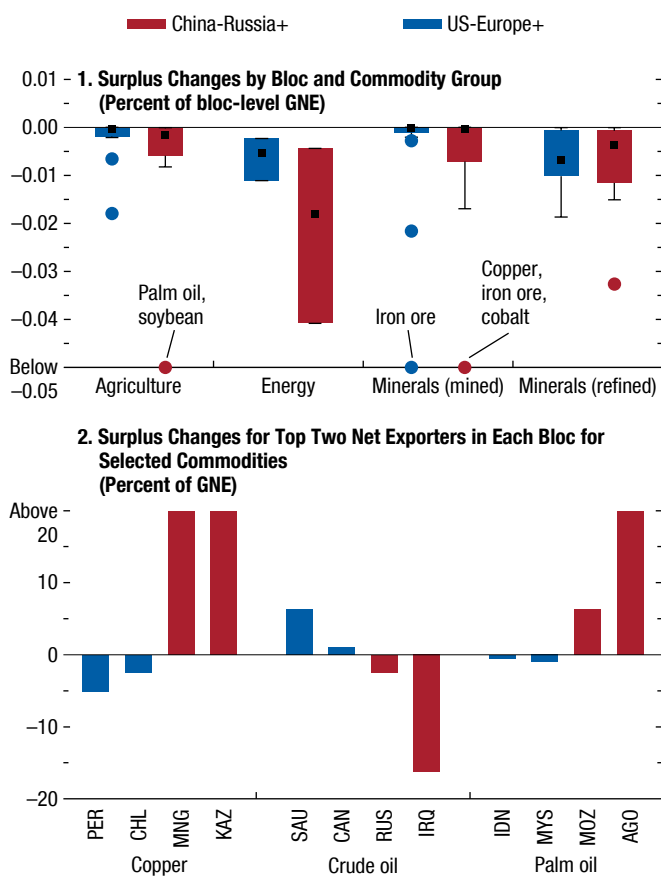
Second, bloc-level changes in total surplus are generally small (with some notable exceptions²³), masking important heterogeneities across countries. Within each bloc, some countries would experience an increase in surplus (net-exporting countries in a net-importing bloc and net-importing countries in a net-exporting bloc), and some experience a decline. Such changes would be small for most countries as a share of gross national expenditure but could be very sizable for a few commodity importers and exporters, as shown in Online Annex Figure 3.5.4. For instance, fragmentation of copper at the mining stage would reduce surplus by as much as 2.5 to 5 percent of gross national expenditure in Chile and Peru, both exporters of copper to the US-Europe+ bloc, in which prices would fall. At the same time, it would lead to large surplus gains in Kazakhstan and Mongolia, which would scale up exports at higher prices to the copper-scarce China-Russia+ bloc (Figure 3.8, panel 2).

Third, restricting trade in commodities that are less price-vulnerable could still generate sizable

²²This result and the following are based Alvarez and others (2023). They also provide the analytical proof. In an integrated world, trade patterns reflect the efficient allocation of resources globally, with countries specializing in commodities for which they have comparative advantage (cost-effective deposits or suitable climate conditions). After fragmentation, trade patterns no longer reflect these comparative advantages.

²³Online Annex Figure 3.5.3 shows the five largest surplus losses at the bloc level from the fragmentation of a single commodity. Such data points are marked as outliers in Figure 3.8, panel 1, capped at –0.05 percent of gross national expenditure. In the main simulation, trade fragmentation of palm oil or copper at the mining stage could lead to surplus losses in the China-Russia+ bloc of more than 1 percent of gross national expenditure, and trade fragmentation of iron ore or soybeans to surplus losses of more than 0.5 percent.

Figure 3.8. Surplus Changes due to Fragmentation in Individual Commodity Markets



Sources: British Geological Survey; Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); International Energy Agency; United States Geological Survey; and IMF staff calculations.

Note: “Energy” refers to coal, natural gas, and crude oil. In panel 1, each data point in the box plots represents the total bloc-level surplus change from fragmenting trade in a single commodity. The black squares in the bars represent the median, the bars are the interquartile range, and the whiskers reflect the data points within 1.5 times the interquartile range from the 25th or 75th percentile across commodities in the group. Dots indicate outliers; the commodities associated with the largest surplus declines are labeled. The bloc including the countries that voted for Russia’s withdrawal from Ukraine in the 2022 UN vote is labeled the “US-Europe+ bloc,” and the remaining countries are included in the “China-Russia+ bloc.” Data labels in the figure use International Organization for Standardization (ISO) country codes. GNE = gross national expenditure.

surplus declines. For example, energy commodities are not particularly vulnerable under the baseline bloc configuration, but the associated declines in surplus would be more significant, because energy commodities are widely consumed and produced. In contrast, minerals could experience strong price changes, but the surplus impact would be more subdued, given their (so far) more limited relevance in most countries’ production and consumption.

Finally, surplus declines would generally be larger in the hypothetical China-Russia+ bloc. Commodities that are most vulnerable are more broadly consumed in this bloc (Online Annex Figure 3.5.3).²⁴

Evidence from the Trade Model

The general equilibrium multicountry, multisector trade model presented in Box 3.3 simulates long-term GDP effects from the disruption of all commodity trade. Broad differences are seen in the impact across countries, with some experiencing sizable losses. Low-income countries could suffer deeper losses, on average estimated at 1.2 percent, given their high dependence on agricultural trade. For some of these countries losses could amount to more than 2 percent of GDP. Consistent with the single-commodity exercise, the hypothetical China-Russia+ bloc is more affected by fragmentation, yet the global GDP loss, at roughly 0.3 percent, is modest as a result of offsetting effects across countries.²⁵

The economic impact can be greatly reduced if commodity trade is only partially restricted. Illustrative simulations, in which countries that abstained from the UN vote on Ukraine are assumed to trade commodities freely, point to much smaller effects of trade barriers between the US-Europe+ and the China-Russia+ blocs. Long-term changes in global GDP from this scenario would be negligible, with meaningful losses only in Russia. This is in line with historical evidence on the ability of demand and supply of commodities to adjust in response to trade restrictions (Box 3.2).

Evidence from the Dynamic Macroeconomic Model

This subsection uses a dynamic stochastic general equilibrium framework to assess the dynamic GDP and inflation effects of commodity fragmentation. The model is based on an augmented version of the

²⁴Sensitivity checks in Online Annex 3.5.2 show that this holds for a bloc configuration based on existing trade relationships. Alternatively, if all emerging market and developing economies, excluding India, Indonesia, and Latin American countries, are assigned to the China-Russia+ bloc, the US-Europe+ bloc could experience larger surplus losses, mainly on account of oil market disruptions.

²⁵Global GDP losses from restricting commodity flows between blocs constitute about 15 percent of the loss from restricting all trade. In comparison, commodities represent only 10 percent of total trade. The larger losses from fragmenting energy and agricultural markets in Bolhuis, Chen, and Kett (2023) stem from the assumption of full autarky compared with the no-trade-between-blocs scenario in the chapter.

IMF’s Global Macroeconomic Model for the Energy Transition.²⁶ It includes the production, consumption, and trade of energy from fossil and renewable sources as well as four minerals critical to the energy transition. Commodities include crude oil, coal, natural gas, copper, nickel, cobalt, and lithium, capturing about 70 percent of the value of global commodity trade. Fragmentation is modeled as a ban on trading these commodities between the two hypothetical blocs, which comprise six different regions.

In the model, fragmentation affects activity through several channels. First, the trade ban induces expenditure switching and trade diversion. Second, temporary imbalances between supply and demand within blocs emerge until prices adjust to clear markets. Such imbalances generate swings in commodity prices. Finally, rigidities affect the speed of adjustment of output, use, and trade, as well as overall macroeconomic effects.

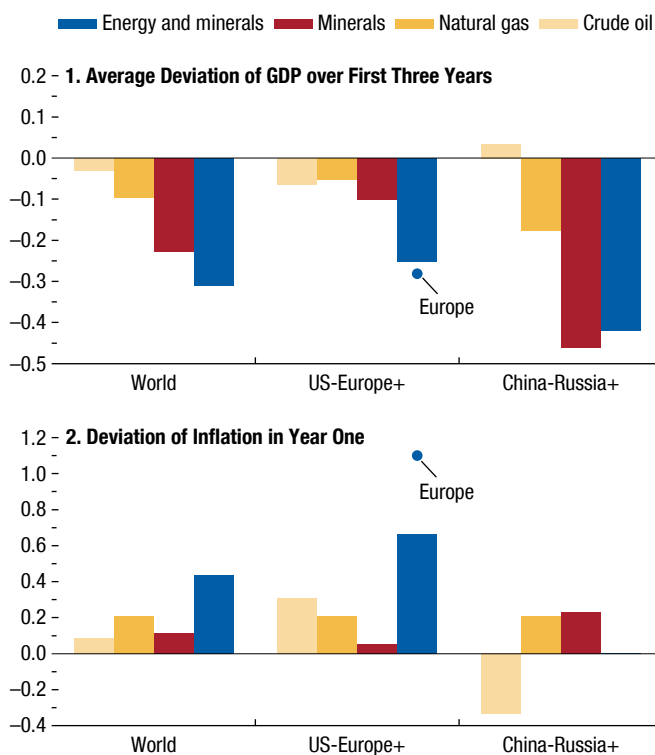
The output and inflation effects could vary significantly across regions, blocs, and commodities (Figure 3.9). Comparison of the impact on individual commodities highlights the channels at play. The effects of fragmenting trade in oil and gas would be quite different, even though the distribution of oil and gas consumption and production would be similar across blocs. For oil, countries could quickly switch to trading partners within their bloc, with limited impact on GDP. By contrast, rigidities such as the need for pipelines or other structures would constrain natural gas trade diversion, with more pronounced effects on GDP. GDP would decline and inflation would increase in both blocs.

In the case of minerals, simulations highlight the importance of the geographic distribution of mining production and rigidities in scaling up refining capacity. On the one hand, fragmentation could lead to a steep rise in prices in the China-Russia+ bloc and sizable declines in real GDP. Roughly 80 percent of the supply of the four minerals is mined in the US-Europe+ bloc, and minerals are used intensively in the China-Russia+ bloc’s sizable manufacturing and construction sector. On the other hand, the US-Europe+ bloc would not be able to benefit from the relative oversupply of minerals at the mining stage because it would take several years to scale

²⁶The model was first used in Chapter 3 of the October 2022 *World Economic Outlook*. It is augmented here by (1) including the possibility of segmenting tradable energy markets and (2) explicitly modeling two types of mineral aggregates composed of copper and nickel as well as cobalt and lithium, respectively. The augmented model has six regions: the United States, the European Union, US-EU-leaning countries, China, Russia, and China-Russia-leaning countries.

Figure 3.9. Impact of Fragmentation on Real GDP and Inflation

(Percent deviation from baseline)



Sources: British Geological Survey; Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); Global Macroeconomic Model for the Energy Transition; Organisation for Economic Co-operation and Development, Inter-Country Input-Output Tables; United States Geological Survey; and IMF staff calculations.

Note: “Energy” refers to coal, natural gas, and crude oil. Region-level results are aggregated to the bloc and world levels using weights based on GDP at purchasing power parity. The bloc including the countries that voted for Russia’s withdrawal from Ukraine in the 2022 UN vote is labeled the “US-Europe+ bloc,” and the remaining countries are included in the “China-Russia+ bloc.”

up refining capacity. That bloc would also experience a GDP decline from mineral market fragmentation.

Trade fragmentation of all seven commodities would be associated with a global GDP loss of about 0.3 percent. However, as in the partial equilibrium and trade models, sizable differences are observed across and within blocs. The simulated losses would be larger in the China-Russia+ bloc. Within the US-Europe+ bloc, Europe could experience a sizable impact on inflation (as much as 100 basis points or more) and GDP, with that impact driven mainly by the fragmentation of oil and gas markets.

Several caveats are worth highlighting. Whereas the model provides regional granularity, it masks the heterogeneity of effects across countries, given the

highly concentrated nature of commodity production. Second, modeling and data constraints allow for the inclusion of only a subset of commodities. Third, the model does not capture the cost from a more volatile inflationary regime, which could make monetary policy more difficult. Finally, the model, like the two complementary analyses preceding it, uses pre-pandemic data on mineral usage and trade flows. Given the sizable projected increase in demand for these minerals throughout the green transition, the macroeconomic relevance of disrupting trade in these commodities will probably be greater—as discussed in the next section.

Implications for the Clean Energy Transition

Fragmentation of commodity markets could affect the cost of decarbonization. Minerals such as copper, nickel, cobalt, and lithium are key inputs for the energy transition. They are used in EVs, in batteries and wiring, and in renewable-energy technologies such as solar panels and wind turbines. Demand for these critical minerals could increase substantially (IEA 2023), and they could become as important to the world economy in a net-zero-emissions scenario as crude oil (Boer, Pescatori, and Stuermer 2023).

Under the scenario of net zero emissions by 2050, the IEA (2023) projects demand for copper to grow by a factor of 1.5, that for nickel and cobalt to double, and that for lithium to increase six times by 2030. This could raise prices substantially, as mining and refining are hard to scale up and are highly concentrated geographically (Figure 3.2, panel 1; Online Annex Figure 3.2.2). For example, Chile and Peru mine more than a third of the world's copper, and Indonesia and the Philippines about half its nickel.

Using the augmented Global Macroeconomic Model for the Energy Transition, this section illustrates the potential effects of mineral market fragmentation on energy transition dynamics.²⁷ The analysis focuses on minerals because they are key inputs for green technologies. The study of fragmentation of other commodity

²⁷Modeling the net effects of fragmentation on innovation and government policies in green technologies, in the more efficient use of commodities, in substitution, and in extraction technologies is beyond the scope of this chapter. There could be competing long-term effects within and across blocs that are not captured by the supply and demand elasticities used in the model (see Acemoglu 2002; Acemoglu and others 2012; Schwerhoff and Stuermer 2020; Hassler, Krusell, and Olovsson 2021; Góes and Bekkers 2022; and Lemoine, forthcoming).

markets relevant for the green transition (such as oil and natural gas markets) is left to future research. The analysis uses projected increases in demand for key critical minerals in a net-zero-emissions scenario (IEA 2023), with the projections assuming that policy incentives stimulate investment in renewable-energy technologies and EVs. It first assumes free commodity trade. With policies left unchanged, it then compares the results with those under a counterfactual scenario of complete mineral market fragmentation across the two hypothetical blocs.

In the integrated-world baseline, the model indicates that world prices of the four key minerals considered could rise by about 90 percent, on average, along the net-zero-emissions-scenario path to 2030. If critical mineral markets are fragmented, the inability of the hypothetical China-Russia+ bloc to import copper, nickel, lithium, and cobalt from countries such as Chile, the Democratic Republic of the Congo, and Indonesia would lead to an additional price increase in that bloc of 300 percent, on average. Acquiring minerals would be more expensive, which would lead to lower investment in solar panels and wind turbines and fewer EVs (Figure 3.10). In this net zero scenario, there would be about 70 percent fewer new EVs in the China-Russia+ bloc in a fragmented world than in an integrated world.²⁸

Fragmentation would cause an oversupply of minerals in the hypothetical US-Europe+ bloc. However, the time needed to scale up mineral refining capacity is assumed to constrain the use of minerals in that bloc. Hence, fragmentation generates only small gains in the US-Europe+ bloc, with a slightly higher number of EVs produced, but no gains in renewable-energy capacity, by 2030.

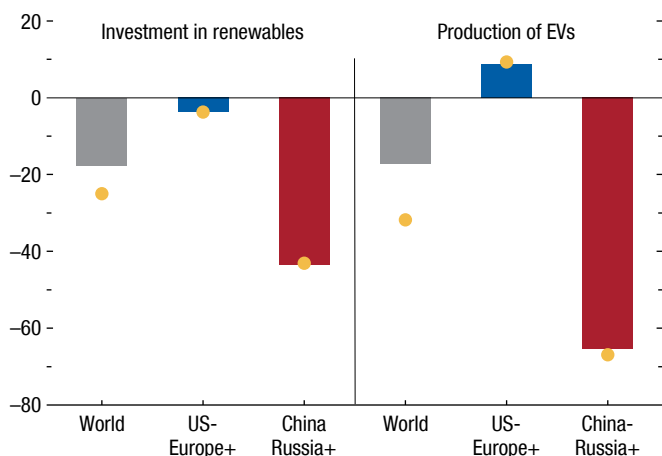
On balance, global net investment in renewable technology and production of EVs would be roughly 20 percent lower compared with the baseline because of mineral market fragmentation.²⁹ This shortfall

²⁸In the fragmentation scenario, China's fiscal cost of supporting investment in reverting to the net-zero-emissions path would be 1½–2 percent of GDP. Quantifying the impact of fragmentation on emissions reduction is outside the scope of this chapter.

²⁹These findings are robust to assuming that technological progress would improve the substitutability of minerals with other inputs. Doubling the elasticity of substitution of the four minerals would reduce the decline in investment in renewable technology from 20 percent to 12 percent, for instance. The shortfall in global green investment because of fragmentation would be more muted, however, if key producers of minerals (Chile, the Democratic Republic of the Congo, Peru) were assigned to the China-Russia+ bloc instead. See the exercise on countries switching blocs earlier in the chapter.

Figure 3.10. Impact of Fragmentation of Critical Mineral Markets on Investment in Renewables and Electric Vehicles, 2030

(Percent deviation from net-zero-emissions scenario without fragmentation)



Sources: British Geological Survey; Gaulier and Zignago (2010); IMF, Global Macroeconomic Model for the Energy Transition; International Energy Agency; United States Geological Survey; and IMF staff estimates.

Note: The bars and dots in the figure report the change in real investment in renewable energy and the production of EVs in a fragmented world relative to the net-zero-emissions path, with demand for cobalt, copper, lithium, and nickel increasing as projected by the International Energy Agency's net-zero-emissions scenario (in an integrated world). Country-level variables are aggregated to the bloc and world levels using weights based on GDP at purchasing power parity in the bars and on greenhouse gas emissions in the dots. The bloc including the countries that voted for Russia's withdrawal from Ukraine in the 2022 UN vote is labeled the "US-Europe+ bloc," and the remaining countries are included in the "China-Russia+ bloc." EVs = electric vehicles.

would increase to about 30 percent if one uses greenhouse gas emissions to weigh the regional response of investment in renewables and EVs. The measure accounts for the greater emissions intensity of activity in the China-Russia+ bloc and hence the greater effort needed to achieve global emissions mitigation goals.³⁰ Decarbonizing the world economy would be more difficult if the market for minerals is fragmented.

Summary and Policy Implications

Commodity markets are an important channel through which geopolitical fragmentation can affect the economy. Many features of commodities underpin their vulnerability in the event of fragmentation: their

³⁰The China-Russia+ bloc accounted for more than half of greenhouse gas emissions in 2020, but only a third of global GDP. Hence, global investment losses are significantly larger when bloc-level changes are aggregated using emissions (the yellow dots in Figure 3.10) rather than purchasing-power-parity-weighted GDP (the bars in Figure 3.10).

highly concentrated and difficult-to-relocate production, hard-to-substitute consumption, and critical role as inputs for manufacturing and key technologies. Fragmentation in commodity markets is on the rise. Measures restricting commodity trade surged in 2022, price differentials across geographic markets have widened for selected commodities, and FDI flows in commodity sectors are in decline—the latter a trend that started before the war in Ukraine.

Illustrative model simulations suggest that more severe fragmentation could cause large changes in commodity prices, depending on the resulting supply-and-demand imbalances and commodities' elasticities of supply and demand. Critical minerals for the energy transition and some highly traded agricultural goods are highly vulnerable in the event of fragmentation.

A fragmented world would be more volatile. Commodity price volatility could intensify as a result of smaller market sizes and the incentives for producers to switch geopolitical allegiances. This could result in volatile inflation dynamics, making monetary policy more complex.

The potential impacts of fragmentation differ vastly across countries, with offsetting effects across consumer and producer countries resulting in modest output losses at the global level. Low-income countries, on average, would experience significantly deeper long-term output declines. Given the heavy reliance on agricultural imports among many low-income countries, fragmentation of agricultural commodities would raise important food security concerns. Illustrative model simulations suggest that a hypothetical China-Russia+ bloc could be more affected economically than a US-Europe+ bloc, although the economic impact would be reduced if commodity trade was only partially restricted or there was a nonaligned bloc. Overall, further fragmentation of commodity markets could deliver an additional blow in an already challenging environment of slow global growth, tight financial conditions, and high debt, a blow that would be particularly harsh for some of the most vulnerable economies.

Fragmentation in critical mineral markets could make the clean energy transition more costly, raising the risks of delaying necessary climate change mitigation. It could add to the upward price pressure in the mineral-scarce bloc in the chapter's illustrative model simulation. The mineral-rich bloc in the simulation could not reap the benefits from oversupply in the near term because it would be unable to scale up refining and processing capacity quickly. In the simulation,

fragmentation results in lower-than-needed global investment in renewables and EVs by 2030 by as much as 30 percent.

Given these findings, should advanced economies try to keep commodity trade open? Should emerging market and developing economies be concerned about the potentially higher cost of the green transition? For both questions, the answer is yes.

Even if the simulations suggest that commodity fragmentation would not result in very deep aggregate output losses in a US-Europe+ bloc, the threat of derailing the global green energy transition should give advanced economies pause. With more than half of worldwide emissions generated by the hypothetical China-Russia+ bloc, averting climate disaster globally hinges on the ability of the economies in that bloc to make a successful and timely clean energy transition. On the other hand, many low- and medium-income countries, whose main objective is raising living standards, may want to think twice, considering the threat of lower output and higher inflation from commodity market fragmentation.

All countries would suffer from the greater volatility and uncertainty that fragmented commodity markets would bring. A protracted process of fragmentation, driven by complex and hard-to-predict policy measures and fluid implementation, would also heighten uncertainty, depressing private investment and potentially diverting scarce public resources toward a suboptimal reshoring of commodity supply.

Preventing fragmentation of commodity markets is the first-best response. Multilateral cooperation can provide guardrails and prevent a vicious spiral of countries imposing restrictions as a risk management effort to mitigate the economic fallout from fragmentation. First-best multilateral solutions include enhanced rules within the World Trade Organization on quantitative restrictions, export tariffs, discriminatory subsidies, local-content requirements, and other commodity-related trade measures (see Bown 2023). This is crucial for food commodities, as food insecurity affects a large swath of the population in low-income countries.³¹

³¹Giordani, Rocha, and Ruta (2016) show that on top of the usual distortionary effects, trade-restricting measures for food can have multiplier effects. High food prices can trigger export restrictions while importers reduce import tariffs. These policies exacerbate tensions in world food markets and could generate another round of trade restrictions.

Second-best solutions can also be considered. Given the potentially adverse effects of fragmentation on the energy transition, a minimum “green corridor” agreement should be established to preserve integrated markets for minerals that are critical for decarbonization. Safeguarding the flow of these minerals can be part of a foundational minimum agreement across countries. Without underestimation of the political difficulties, such a corridor agreement could be easier to agree on, because it would focus on a smaller set of commodities and countries. Similar “food corridor” agreements could provide guardrails in essential agricultural commodity markets, ensure equal access to food across countries of all income levels, and reduce the likelihood of humanitarian disasters in a world of more frequent supply shocks.

While many minerals used in clean energy technologies are bound to become critical for the global economy, the paucity of data on their consumption, production, and inventories raises uncertainty for producers and consumers and could hide potential risks for financial markets. In this respect, the international community could facilitate the green transition and support energy security by setting up a platform or organization to improve sharing and standardization of international data on mineral production, consumption, and inventories. The initiative could be similar to the Joint Organisations Data Initiative for fossil fuels and the Agricultural Market Information System for food commodities.

Even as policymakers strive to mitigate the risk of fragmentation, countries can take steps to minimize the potential economic fallout. The geographic concentration of production and lack of diversification of commodity suppliers call for (1) fostering investment in domestic mining, exploration, and recycling of critical minerals; (2) diversification of supply sources; and (3) investing in infrastructure to reduce trade costs and improve market integration. Support for innovation to speed technological progress—and develop substitutes—would enhance efficiency in the use and buildup of strategic reserves. Multilateral cooperation would enhance efficiency and prevent negative cross-country spillovers.

Broader policies that strengthen countries’ resilience to shocks can help mitigate the effects of commodity shocks. These include strengthening macroeconomic, structural, and fiscal policy frameworks; building fiscal and financial buffers; and developing preparedness plans in case of sudden disruptions in

commodity supply. Countries should also reinforce social safety nets to protect vulnerable households from higher commodity prices and volatility. Since fragmentation in physical commodity markets could exacerbate financial market volatility and result in sharp exchange rate adjustments, policy measures that prevent disruptions in commodity-derivatives markets and financial instability may be warranted (April 2023 *Global Financial Stability Report*).

Industrial policies are only the third-best approach and must be designed carefully to ensure equal treatment of firms across competitive markets to avert adverse cross-country spillovers, minimize distortions and inefficiencies, and mitigate fiscal risks and harmful

political economy outcomes. “Friend-shoring” policies can also be market distorting and costly. Both sets of policies should be used only under particular conditions, such as in the presence of clear market failures or narrowly defined national security concerns. Domestic and global costs are more limited—and economies more resilient to shocks—if restriction-free trade applies to larger economic zones. Country-based restrictions on domestic content are suboptimal, because they can interfere with price signals, reduce competition, and therefore lower productivity. Developing a framework for international consultations on friend-shoring practices could help identify negative cross-border spillovers and mitigate adverse consequences.

Box 3.1. Commodity Trade Tensions: Evidence from Tanker Traffic Data

Since its invasion of Ukraine, Russia's oil exports have been subject to sanctions and have been voluntarily shunned by firms. What has been the impact on oil trade flows? Granular real-time data on tanker shipping patterns from the Automatic Identification System¹ uncover significant shifts in routes, resulting in economic inefficiencies.

The European Union, United Kingdom, and United States banned most imports of crude oil and petroleum products from Russia after Russia's invasion of Ukraine. Western restrictions on dollar payments have been reported to be a barrier to shipments. Group of Seven (G7) members also prohibited transportation

The authors of this box are Seung Mo Choi and Alessandra Sozzi.

¹The Automatic Identification System is a mandatory self-reporting system for all ships above 300 gross tons. It has been used to construct real-time trade indicators (examples are included in Arslanalp, Marini, and Tumbarello 2019; Cerdeiro and others 2020; and Arslanalp, Koepke, and Verschuur 2021). PortWatch (<https://www.imf.org/portwatch>) is an online platform that monitors trade disruptions and assesses spillovers through port-to-port links.

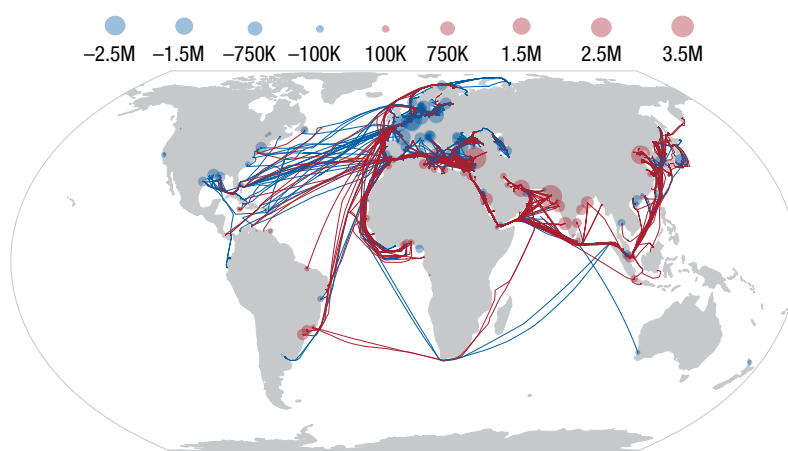
and insurance services to tankers carrying Russian commodities above certain price thresholds.

Automatic Identification System data reveal that the traffic patterns of Russia's tankers have since changed substantially (Figure 3.1.1). Tanker shipments from Russian ports to Japan, the United States, and the European Union declined between April–June 2019 and the same period in 2023. Other countries are also now providing oil supplies. For example, the European Union receives more shipments from countries such as Norway, the United Arab Emirates, and the United States, but this extends the length of tanker routes by 20 percent.²

On the flip side, Russian oil shipments rose after the invasion to countries such as China, India, Türkiye, and the United Arab Emirates. About 35 to 40 percent of India's crude oil imports came from Russia during April–June 2023, a stark rise from less than 5 percent before the war in Ukraine. While India's oil exports (mostly petroleum products) are small relative to its oil imports (mostly crude oil), India increased its oil exports to the European Union substantially.

²UNCTAD (2022) documents a rise in tanker freight rates following the Russian invasion of Ukraine.

Figure 3.1.1. Changes in Tanker Shipments from Russia's Ports from 2019:Q2 to 2023:Q2
(Metric tons, decreases in blue and increases in red)



Sources: Natural Earth; UN Global Platform; and IMF staff calculations.

Note: The bubble size indicates the magnitude of the change for the destination port. Lines indicate travel routes.

Box 3.2. Commodity Market Fragmentation in History: Many Shades of Gray

History points to a fluid range of experiences of fragmentation in commodity markets: from full trade disruption during World War II, to limited and controlled trade during the Cold War, to trade embargoes and other export restrictions. Fragmentation has rarely lasted, given commodities' fungibility and arbitrage opportunities.

During World War II, trade among the three major blocs—German-controlled Europe, Japanese-controlled Asia, and the rest of the world (the Allies)—stopped (Findlay and O'Rourke 2007).¹ Some blocs faced commodity shortages: for example, shortages of crude oil (produced mostly by the Allies) in Germany and Japan and of natural rubber (produced mostly by Japan) in the Allies (Tuttle 1981). In both cases, governments worked with firms to alleviate shortages. Germany developed a coal-based synthetic fuel industry. By 1940, the fuel it produced accounted for nearly half of Germany's oil supply and 95 percent of its aviation fuel (Painter 2012). The US government stockpiled natural rubber and worked with industry to develop synthetic rubber (ACS 1998).

During the Cold War, trade between the US-led and the Soviet Union–led blocs was limited as a result of the Soviet strategy of self-sufficiency.² The Soviet Union traded crude oil, natural gas, and some metals for manufactured and agricultural goods, especially wheat. Traders often skirted government policies to

facilitate this exchange (Farchy and Blas 2021). Political considerations also dominated trade. For example, after the Soviet invasion of Afghanistan, US President Jimmy Carter imposed a partial embargo on US grain exports to the Soviet Union.³ The embargo, however, was ineffective due to the global nature of grain markets. While Soviet imports of US wheat fell sharply, they were replaced by imports from other countries, especially Argentina (Oki 2008).

Commodity market embargoes have often been used to apply political pressure. The Arab members of the Organization of the Petroleum Exporting Countries (OPEC) initiated an export embargo against the United States and other countries in 1973 during the Arab-Israeli war and announced a 25 percent cut in output. Oil prices more than quadrupled between September 1973 and January 1974. The oil market was significantly disrupted; however, the disruption was short-lived, as traders diverted oil to embargoed countries and production from non-OPEC countries rose (McNally 2017). Importers also took steps to reduce vulnerability, for example, by mandating efficiency improvements and creating strategic oil inventories (Baffes and Nagle 2022).

Another embargo example is that of South Africa during apartheid. Several governments implemented wide-ranging bans on exports to South Africa, particularly crude oil. However, sanctions were blunted by traders who were willing to risk violating sanctions to supply oil at high prices (Farchy and Blas 2021). Overall, the historical examples showcase the ability of fungible commodities to find their way from producers to consumers, absent near-absolute trade barriers.

The author of this box is Peter Nagle.

¹Trade between blocs and neutral countries was affected by the war. For example, the United Kingdom and United States bought much of the Spanish tungsten output to raise its price and limit availability for Germany. Between 1941 and 1943, the price of tungsten rose 13-fold (Caruana and Rockoff 2001).

²East-West trade was sharply reduced by the Cold War, from three-quarters of trade by the East in 1938 to 14 percent in 1953. In contrast, within-bloc trade and interdependence rose (Spulber and Gehrels 1958; Foreman-Peck 1995).

³In 1980, the Soviet Union planned to import 35 million metric tons of grain—25 million of that from the United States. It ended up importing only 8 million tons, committed to under a previous treaty (JEC 1980).

Box 3.3. The Uneven Economic Effects of Commodity Market Fragmentation

Fragmentation of commodity markets affects countries and households differently. This box demonstrates that low-income countries are more vulnerable in the event of fragmentation, especially of agricultural commodities, owing to their greater reliance on food imports. The finding raises important food security concerns should further fragmentation materialize.

To quantify the impact on long-term GDP of fragmentating trade in multiple commodities simultaneously, a multicountry, multisector trade model is used in this box, following Caliendo and Parro (2015). Bolhuis, Chen, and Kett (2023) augment the model to account for trade and production of 133 commodities across 145 countries. Labor is the only factor of production, and productivity is exogenous. Commodities are used as intermediate inputs, with a long-term supply elasticity of 1. The model accounts for the input-output structure of global trade and assumes low

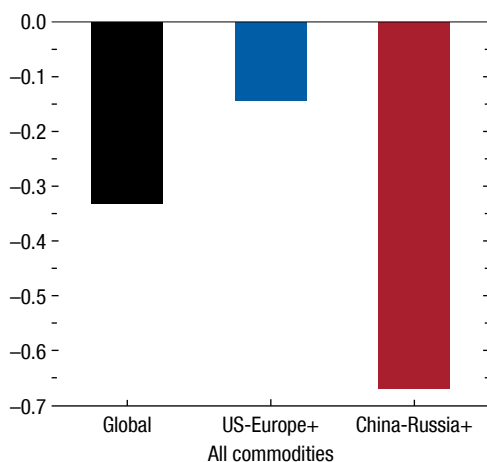
elasticity of substitution between commodities and other inputs in the production of manufactured goods. Trade costs are set such that there is no commodity trade between blocs.

Results show that the aggregate impact of commodity fragmentation would be moderate, with a global GDP loss of 0.3 percent (Figure 3.3.1). However, there would be large differences within and across blocs. Some economies might benefit from trade diversion as competitors lose access to export markets. Most would experience permanent output declines. Losses would be larger in countries where commodity trade with the other bloc was significant. The China-Russia+ bloc and low-income countries—whose economies are more commodity-intensive—would lose more.

Low-income countries' high dependence on imports of agricultural goods would make them particularly vulnerable (Figure 3.3.2). Disrupting trade in food commodities alone would lead to losses of 1 percent of GDP. Commodity fragmentation could also have high social and humanitarian costs and would be particularly harmful for lower-income households, which spend a large share of their incomes on food and fuel.

The authors of this box are Marijn Bolhuis, Jiaqian Chen, and Benjamin Kett. See Bolhuis, Chen, and Kett (2023) for further details.

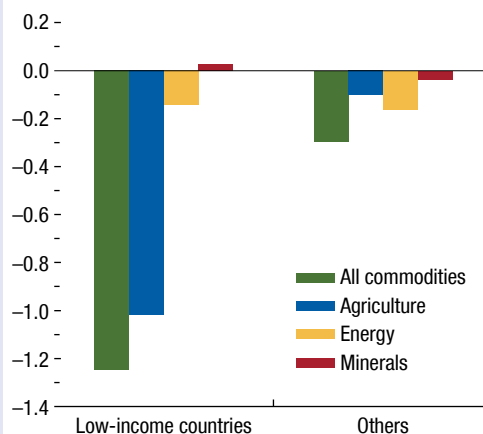
Figure 3.3.1. Estimated Output Losses
(Percent deviation from baseline)



Sources: British Geological Survey; Eora Global Supply Chain database; Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); US Geological Survey; and IMF staff calculations.

Note: The bars represent the losses in GDP relative to baseline from eliminating trade in commodities across hypothetical blocs. Country-level losses are aggregated using weights based on GDP at purchasing power parity. For details, see Bolhuis, Chen, and Kett (2023).

Figure 3.3.2. Estimated GDP Losses in Low-Income Countries and Others
(Percent deviation from baseline)



Sources: British Geological Survey; Eora Global Supply Chain database; Food and Agriculture Organization of the United Nations; Gaulier and Zignago (2010); US Geological Survey; and IMF staff calculations.

Note: The bars represent the losses in GDP relative to baseline from eliminating trade in groups of commodities across hypothetical blocs. Country-level losses are aggregated using weights based on GDP at purchasing power parity. For details, see Bolhuis, Chen, and Kett (2023).

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The Statistical Appendix presents historical data as well as projections. It comprises eight sections: Assumptions, What's New, Data and Conventions, Country Notes, Classification of Countries, General Features and Composition of Groups in the *World Economic Outlook* Classification, Key Data Documentation, and Statistical Tables.

The first section summarizes the assumptions underlying the estimates and projections for 2023–24. The second section briefly describes the changes to the database and statistical tables since the April 2023 *World Economic Outlook* (WEO). The third section offers a general description of the data and the conventions used for calculating country group composites. The fourth section presents selected key information for each country. The fifth section summarizes the classification of countries in the various groups presented in the WEO, and the sixth section explains that classification in further detail. The seventh section provides information on methods and reporting standards for the member countries' national account and government finance indicators included in the report.

The last, and main, section comprises the statistical tables. Statistical Appendix A is included here; Statistical Appendix B is available online at www.imf.org/en/Publications/WEO.

Data in these tables have been compiled on the basis of information available through September 25, 2023. The figures for 2023–24 are shown with the same degree of precision as the historical figures solely for convenience; because they are projections, the same degree of accuracy is not to be inferred.

Assumptions

Real effective *exchange rates* for the advanced economies are assumed to remain constant at their average levels measured during July 25, 2023–August 22, 2023. For 2023 and 2024 these assumptions imply average US dollar–special drawing right conversion rates of 1.340 and 1.340, US dollar–euro

conversion rates¹ of 1.088 and 1.094, and yen–US dollar conversion rates of 139.1 and 143.1, respectively.

It is assumed that the *price of oil* will average \$80.49 a barrel in 2023 and \$79.92 a barrel in 2024.

National authorities' established *policies* are assumed to be maintained. Box A1 describes the more specific policy assumptions underlying the projections for selected economies.

With regard to *interest rates*, it is assumed that the *three-month government bond yield* for the United States will average 5.3 percent in 2023 and 5.4 percent in 2024, that for the euro area will average 3.0 percent in 2023 and 3.2 percent in 2024, and that for Japan will average –0.2 percent in 2023 and –0.1 percent in 2024. Further it is assumed that the *10-year government bond yield* for the United States will average 3.8 percent in 2023 and 4.0 percent in 2024, that for the euro area will average 2.4 percent in 2023 and 2.6 percent in 2024, and that for Japan will average 0.5 percent in 2023 and 0.6 percent in 2024.

What's New

- *Ecuador's* fiscal sector projections, which were previously omitted due to ongoing program discussions, are now included.
- *Eritrea's* data and projections for 2020–28 are excluded from the database due to constraints in data reporting.
- *Sri Lanka's* projections for 2023–28 are excluded from publication owing to ongoing discussions on sovereign debt restructuring.
- *Ukraine's* projections for 2024–28, in line with the program's baseline scenario, are now included.
- For *West Bank and Gaza*, certain projections for 2022–28 are excluded from publication pending methodological adjustments to statistical series.

¹In regard to the introduction of the euro, on December 31, 1998, the Council of the European Union decided that, effective January 1, 1999, the irrevocably fixed conversion rates between the euro and currencies of the member countries adopting the euro are as described in Box 5.4 of the October 1998 WEO. See that box as well for details on how the conversion rates were established. For the most recent table of fixed conversion rates, see the Statistical Appendix of the April 2023 WEO.

Data and Conventions

Data and projections for 196 economies form the statistical basis of the WEO database. The data are maintained jointly by the IMF's Research Department and regional departments, with the latter regularly updating country projections based on consistent global assumptions.

Although national statistical agencies are the ultimate providers of historical data and definitions, international organizations are also involved in statistical issues, with the objective of harmonizing methodologies for the compilation of national statistics, including analytical frameworks, concepts, definitions, classifications, and valuation procedures used in the production of economic statistics. The WEO database reflects information from both national source agencies and international organizations.

Most countries' macroeconomic data as presented in the WEO conform broadly to the 2008 version of the *System of National Accounts* (SNA 2008). The IMF's sector statistical standards—the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6), the *Monetary and Financial Statistics Manual and Compilation Guide*, and the *Government Finance Statistics Manual 2014* (GFSM 2014)—have been aligned with the SNA 2008. These standards reflect the IMF's special interest in countries' external positions, monetary developments, financial sector stability, and public sector fiscal positions. The process of adapting country data to the new standards begins in earnest when the manuals are released. However, full concordance with the manuals is ultimately dependent on the provision by national statistical compilers of revised country data; hence, the WEO estimates are only partly adapted to these manuals. Nonetheless, for many countries, conversion to the updated standards will have only a small impact on major balances and aggregates. Many other countries have partially adopted the latest standards and will continue implementation over a number of years.²

The fiscal gross and net debt data reported in the WEO are drawn from official data sources and IMF staff estimates. While attempts are made to align gross and net debt data with the definitions in the GFSM

² Many countries are implementing the SNA 2008 or European System of National and Regional Accounts 2010, and a few countries use versions of the SNA older than that from 1993. A similar adoption pattern is expected for the BPM6 and GFSM 2014. Please refer to Table G, which lists the statistical standards to which each country adheres.

2014, as a result of data limitations or specific country circumstances, these data can sometimes deviate from the formal definitions. Although every effort is made to ensure the WEO data are relevant and internationally comparable, differences in both sectoral and instrument coverage mean that the data are not universally comparable. As more information becomes available, changes in either data sources or instrument coverage can give rise to data revisions that are sometimes substantial. For clarification on the deviations in sectoral or instrument coverage, please refer to the metadata for the online WEO database.

Composite data for country groups in the WEO are either sums or weighted averages of data for individual countries. Unless noted otherwise, multiyear averages of growth rates are expressed as compound annual rates of change.³ Arithmetically weighted averages are used for all data for the emerging market and developing economies group—except data on inflation and money growth, for which geometric averages are used. The following conventions apply:

Country group composites for exchange rates, interest rates, and growth rates of monetary aggregates are weighted by GDP converted to US dollars at market exchange rates (averaged over the preceding three years) as a share of group GDP.

Composites for other data relating to the domestic economy, whether growth rates or ratios, are weighted by GDP valued at purchasing power parity as a share of total world or group GDP.⁴ For the aggregation of world and advanced economies (and subgroups) inflation, annual rates are simple percentage changes from the previous years; for the aggregation of emerging market and developing economies (and subgroups) inflation, annual rates are based on logarithmic differences.

Composites for real GDP per capita in *purchasing-power-parity* terms are sums of individual country data

³ Averages for real GDP, inflation, GDP per capita, and commodity prices are calculated based on the compound annual rate of change, except in the case of the unemployment rate, which is based on the simple arithmetic average.

⁴ See Box 1.1 of the October 2020 WEO for a summary of the revised purchasing-power-parity-based weights as well as "Revised Purchasing Power Parity Weights" in the July 2014 WEO *Update*, Appendix 1.1 of the April 2008 WEO, Box A2 of the April 2004 WEO, Box A1 of the May 2000 WEO, and Annex IV of the May 1993 WEO. See also Anne-Marie Gulde and Marianne Schulze-Ghattas, "Purchasing Power Parity Based Weights for the *World Economic Outlook*," in *Staff Studies for the World Economic Outlook* (Washington, DC: International Monetary Fund, December 1993), 106–23.

after conversion to international dollars in the years indicated.

Unless noted otherwise, composites for all sectors for the euro area are corrected for reporting discrepancies in transactions within the area. Unadjusted annual GDP data are used for the euro area and for the majority of individual countries, except for Cyprus, Ireland, Portugal, and Spain, which report calendar-adjusted data. For data prior to 1999, data aggregations apply 1995 European currency unit exchange rates.

Composites for fiscal data are sums of individual country data after conversion to US dollars at the average market exchange rates in the years indicated.

Composite unemployment rates and employment growth are weighted by labor force as a share of group labor force.

Composites relating to external sector statistics are sums of individual country data after conversion to US dollars at the average market exchange rates in the years indicated for balance of payments data and at end-of-year market exchange rates for debt denominated in currencies other than US dollars.

Composites of changes in foreign trade volumes and prices, however, are arithmetic averages of percent changes for individual countries weighted by the US dollar value of exports or imports as a share of total world or group exports or imports (in the preceding year).

Unless noted otherwise, group composites are computed if 90 percent or more of the share of group weights is represented.

Data refer to calendar years, except in the case of a few countries that use fiscal years; Table F lists the economies with exceptional reporting periods for national accounts and government finance data.

For some countries, the figures for 2022 and earlier are based on estimates rather than actual outturns; Table G lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments for each country.

Country Notes

Afghanistan: Data for 2021 and 2022 are estimates and reported for selected indicators only, and projections for 2023–28 are omitted because of an unusually high degree of uncertainty given that the IMF has paused its engagement with the country owing to a lack of clarity within the international community regarding the recognition of a government in Afghanistan.

Algeria: Total government expenditure and net lending/borrowing include net lending by the government, which mostly reflects support to the pension system and other public sector entities.

Argentina: The official national consumer price index (CPI) starts in December 2016. For earlier periods, CPI data for Argentina reflect the Greater Buenos Aires Area CPI (prior to December 2013); the national CPI (IPCNu, December 2013 to October 2015); the City of Buenos Aires CPI (November 2015 to April 2016); and the Greater Buenos Aires Area CPI (May 2016 to December 2016). Given limited comparability of these series because of differences in geographical coverage, weights, sampling, and methodology, the WEO does not report average CPI inflation for 2014–16 and end-of-period inflation for 2015–16. Also, Argentina discontinued the publication of labor market data starting in the fourth quarter of 2015, and new series became available starting in the second quarter of 2016.

Bangladesh: Data and forecasts are presented on a fiscal year basis. However, country group aggregates that include Bangladesh use calendar year estimates of real GDP and purchasing-power-parity GDP.

Costa Rica: The central government definition has been expanded as of January 1, 2021, to include 51 public entities as per Law 9524. Data back to 2019 are adjusted for comparability.

Dominican Republic: The fiscal series have the following coverage: public debt, debt service, and the cyclically adjusted/structural balances are for the consolidated public sector (which includes the central government, the rest of the nonfinancial public sector, and the central bank); the remaining fiscal series are for the central government.

Eritrea: Data and projections for 2020–28 are excluded from the database due to constraints in data reporting.

India: Real GDP growth rates are calculated as per national accounts: for 1998 to 2011 with base year 2004/05 and, thereafter, with base year 2011/12.

Iran: Historical figures of nominal GDP in US dollars are computed using the official exchange rate up to 2017. From 2018 onward, the NIMA exchange rate, rather than the official exchange rate, is now used to convert nominal rial GDP figures into US dollars. The IMF staff assesses that the NIMA rate better reflects the transaction-value-weighted exchange rate in the economy over that period of time.

Italy: Data and forecasts reflect information available through September 21, 2023.

Lebanon: Data for 2021–22 are IMF staff estimates and not provided by the national authorities. Projections for 2023–28 are omitted owing to an unusually high degree of uncertainty.

Libya: Projections do not include the impact of the floods which occurred in September 2023.

Sierra Leone: Although the currency was redenominated on July 1, 2022, local currency data are expressed in the old leone for the October 2023 WEO.

Sri Lanka: Projections for 2023–28 are excluded from publication owing to ongoing discussions on sovereign debt restructuring.

Sudan: Projections reflect staff's analysis based on the assumption that the conflict will end by the end of 2023.

Syria: Data are excluded from 2011 onward because of the uncertain political situation.

Türkiye: The projections are based on information available as of September 8, 2023, and do not fully incorporate a policy rate increase and additional quantitative tightening made after that date.

Turkmenistan: Real GDP data are IMF staff estimates compiled in line with international methodologies (SNA), using official estimates and sources as well as United Nations and World Bank databases. Estimates of and projections for the fiscal balance exclude receipts from domestic bond issuances as well as privatization operations, in line with the GFSM 2014. The authorities' official estimates for fiscal accounts, which are compiled using domestic statistical methodologies, include bond issuance and privatization proceeds as part of government revenues.

Ukraine: Revised national accounts data are available beginning in 2000 and exclude Crimea and Sevastopol from 2010 onward.

United Kingdom: Projections do not incorporate the significant statistical upward revisions to 2020 and 2021 GDP that were previewed on September 1, 2023 (with a release date of September 29, 2023).

Uruguay: In December 2020 the authorities began reporting the national accounts data according to the SNA 2008, with the base year 2016. The new series begin in 2016. Data prior to 2016 reflect the IMF staff's best effort to preserve previously reported data and avoid structural breaks.

Since October 2018 *Uruguay's* public pension system has been receiving transfers in the context of law 19,590 that compensates persons affected by the creation of the mixed pension system. These funds are

recorded as revenues, consistent with the IMF's methodology. Therefore, data and projections for 2018–22 are affected by these transfers, which amounted to 1.2 percent of GDP in 2018, 1.1 percent of GDP in 2019, 0.6 percent of GDP in 2020, 0.3 percent of GDP in 2021, 0.1 percent of GDP in 2022, and 0 percent thereafter. See IMF Country Report 19/64 for further details.⁵ The disclaimer about the public pension system applies only to the revenues and net lending/borrowing series.

The coverage of the fiscal data for *Uruguay* was changed from consolidated public sector to nonfinancial public sector with the October 2019 WEO. In *Uruguay*, nonfinancial public sector coverage includes the central government, local government, social security funds, nonfinancial public corporations, and Banco de Seguros del Estado. Historical data were also revised accordingly. Under this narrower fiscal perimeter—which excludes the central bank—assets and liabilities held by the nonfinancial public sector for which the counterpart is the central bank are not netted out in debt figures. In this context, capitalization bonds issued in the past by the government to the central bank are now part of the nonfinancial public sector debt. Gross and net debt estimates for 2008–11 are preliminary.

Venezuela: Projecting the economic outlook, including assessing past and current economic developments used as the basis for the projections, is rendered difficult by the lack of discussions with the authorities (the most recent Article IV consultation took place in 2004), incomplete metadata of limited reported statistics, and difficulties in reconciling reported indicators with economic developments. The fiscal accounts include the budgetary central government; social security; FOGADE (insurance deposit institution); and a reduced set of public enterprises, including *Petróleos de Venezuela, S.A. (PDVSA)*. Following some methodological upgrades to achieve a more robust nominal GDP, historical data and indicators expressed as a percentage of GDP have been revised from 2012 onward. For most indicators, data for 2018–22 are IMF staff estimates. The effects of hyperinflation and the paucity of reported data mean that the IMF staff's projected macroeconomic indicators should be interpreted with caution. Broad uncertainty surrounds these projections. *Venezuela's* consumer prices are excluded from all WEO group composites.

⁵ *Uruguay: Staff Report for the 2018 Article IV Consultation*, Country Report 19/64 (Washington, DC: International Monetary Fund, February 2019).

West Bank and Gaza: Certain projections for 2022–28 are excluded from publication pending methodological adjustments to statistical series.

Zimbabwe: Authorities have recently finished re-nominating their national accounts statistics following the introduction in 2019 of the Real Time Gross Settlement dollar, later renamed the Zimbabwe dollar. The Zimbabwe dollar previously ceased circulating in 2009, and during 2009–19 Zimbabwe operated under a multicurrency regime with the US dollar as the unit of account.

Classification of Countries

Summary of the Country Classification

The country classification in the WEO divides the world into two major groups: advanced economies and emerging market and developing economies.⁶ This classification is not based on strict criteria, economic or otherwise, and has evolved over time. The objective is to facilitate analysis by providing a reasonably meaningful method of organizing data. Table A provides an overview of the country classification, showing the number of countries in each group by region and summarizing some key indicators of their relative size (GDP valued at purchasing power parity, total exports of goods and services, and population).

Some countries remain outside the country classification and therefore are not included in the analysis. Cuba and the Democratic People’s Republic of Korea are examples of countries that are not IMF members, and the IMF therefore does not monitor their economies.

General Features and Composition of Groups in the World Economic Outlook Classification

Advanced Economies

Table B lists the 41 advanced economies. The seven largest in terms of GDP based on market exchange rates—the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada—constitute the subgroup of major advanced economies, often referred to as the Group of Seven. The members of the euro area are also distinguished as a subgroup. Composite data shown in the tables for the euro area cover

⁶As used here, the terms “country” and “economy” do not always refer to a territorial entity that is a state as understood by international law and practice. Some territorial entities included here are not states, although their statistical data are maintained on a separate and independent basis.

the current members for all years, even though the membership has increased over time.

Table C lists the member countries of the European Union, not all of which are classified as advanced economies in the WEO.

Emerging Market and Developing Economies

The group of emerging market and developing economies (155) comprises all those that are not classified as advanced economies.

The regional breakdowns of emerging market and developing economies are emerging and developing Asia; emerging and developing Europe (sometimes also referred to as “central and eastern Europe”); Latin America and the Caribbean; Middle East and Central Asia (which comprises the regional subgroups Caucasus and Central Asia; and Middle East, North Africa, Afghanistan, and Pakistan); and sub-Saharan Africa.

Emerging market and developing economies are also classified according to *analytical criteria* that reflect the composition of export earnings and a distinction between net creditor and net debtor economies. Tables D and E show the detailed composition of emerging market and developing economies in the regional and analytical groups.

The analytical criterion *source of export earnings* distinguishes between the categories *fuel* (Standard International Trade Classification [SITC] 3) and *nonfuel* and then focuses on *nonfuel primary products* (SITCs 0, 1, 2, 4, and 68). Economies are categorized into one of these groups if their main source of export earnings exceeded 50 percent of total exports on average between 2018 and 2022.

The financial and income criteria focus on *net creditor economies*, *net debtor economies*, *heavily indebted poor countries* (HIPCs), *low-income developing countries* (LIDCs), and *emerging market and middle-income economies* (EMMIEs). Economies are categorized as net debtors when their latest net international investment position, where available, was less than zero or their current account balance accumulations from 1972 (or earliest available data) to 2022 were negative. Net debtor economies are further differentiated on the basis of *experience with debt servicing*.⁷

⁷During 2018–22, 39 economies incurred external payments arrears or entered into official or commercial bank debt-rescheduling agreements. This group is referred to as *economies with arrears and/or rescheduling during 2018–22*.

The HIPC group comprises the countries that are or have been considered by the IMF and the World Bank for participation in their debt initiative known as the HIPC Initiative, which aims to reduce the external debt burdens of all the eligible HIPCs to a “sustainable” level in a reasonably short period of time.⁸ Many of these countries have already

⁸See David Andrews, Anthony R. Boote, Syed S. Rizavi, and Sukwinder Singh, “Debt Relief for Low-Income Countries: The Enhanced HIPC Initiative,” IMF Pamphlet Series 51 (Washington, DC: International Monetary Fund, November 1999).

benefited from debt relief and have graduated from the initiative.

The LIDCs are countries that have per capita income levels below a certain threshold (set at \$2,700 in 2016 as measured by the World Bank’s Atlas method), structural features consistent with limited development and structural transformation, and external financial linkages insufficiently close for them to be widely seen as emerging market economies.

The EMMIEs group comprises emerging market and developing economies that are not classified as LIDCs.

Table A. Classification by *World Economic Outlook* Groups and Their Shares in Aggregate GDP, Exports of Goods and Services, and Population, 2022¹
(Percent of total for group or world)

	Number of Economies	GDP		Exports of Goods and Services		Population	
		Advanced Economies	World	Advanced Economies	World	Advanced Economies	World
Advanced Economies	41	100.0	41.7	100.0	60.5	100.0	13.9
United States		37.3	15.5	16.0	9.7	30.7	4.3
Euro Area	20	28.9	12.0	41.5	25.1	31.8	4.4
Germany		7.9	3.3	10.9	6.6	7.7	1.1
France		5.4	2.3	5.4	3.2	6.0	0.8
Italy		4.5	1.9	4.0	2.4	5.4	0.8
Spain		3.3	1.4	3.1	1.9	4.4	0.6
Japan		9.0	3.8	4.9	2.9	11.5	1.6
United Kingdom		5.4	2.3	5.3	3.2	6.2	0.9
Canada		3.3	1.4	3.8	2.3	3.6	0.5
Other Advanced Economies	17	16.1	6.7	28.5	17.3	16.1	2.2
<i>Memorandum</i>							
Major Advanced Economies	7	72.7	30.3	50.2	30.4	71.3	9.9
		Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World
Emerging Market and Developing Economies	155	100.0	58.3	100.0	39.5	100.0	86.1
Regional Groups							
Emerging and Developing Asia	30	56.2	32.8	49.4	19.5	55.7	47.9
China		31.6	18.4	30.1	11.9	21.0	18.1
India		12.5	7.3	6.3	2.5	21.1	18.2
Emerging and Developing Europe	15	12.8	7.4	15.8	6.2	5.4	4.7
Russia		5.0	2.9	5.2	2.0	2.1	1.8
Latin America and the Caribbean	33	12.7	7.4	13.4	5.3	9.5	8.1
Brazil		4.0	2.3	3.1	1.2	3.0	2.6
Mexico		3.2	1.9	5.1	2.0	1.9	1.7
Middle East and Central Asia	32	13.0	7.6	17.1	6.8	12.9	11.1
Saudi Arabia		2.3	1.3	3.6	1.4	0.5	0.4
Sub-Saharan Africa	45	5.4	3.1	4.2	1.7	16.5	14.2
Nigeria		1.3	0.8	0.6	0.2	3.2	2.8
South Africa		1.0	0.6	1.1	0.4	0.9	0.8
Analytical Groups²							
By Source of Export Earnings							
Fuel	26	10.3	6.0	16.6	6.6	9.6	8.3
Nonfuel	127	89.7	52.3	83.3	32.9	90.3	77.7
Of which, Primary Products	33	4.4	2.6	4.1	1.6	8.8	7.5
By External Financing Source							
Net Debtor Economies	120	51.9	30.3	46.0	18.2	69.4	59.7
Of which, Economies with Arrears and/or Rescheduling during 2018–22	39	5.3	3.1	3.9	1.6	12.4	10.7
Other Groups²							
Emerging Market and Middle-Income Economies	95	91.6	53.4	92.9	36.7	76.0	65.4
Low-Income Developing Countries	59	8.4	4.9	7.1	2.8	24.0	20.6
Heavily Indebted Poor Countries	39	2.8	1.6	2.1	0.8	12.6	10.8

¹The GDP shares are based on the purchasing-power-parity valuation of economies' GDP. The number of economies comprising each group reflects those for which data are included in the group aggregates.

²Syria and West Bank and Gaza are omitted from the source of export earnings, and Syria is omitted from the net external position group composites, because of insufficient data. Syria is not included in Emerging Market and Middle-Income Economies or Low-Income Developing Countries.

Table B. Advanced Economies by Subgroup

Major Currency Areas		
United States		
Euro Area		
Japan		
Euro Area		
Austria	Germany	Malta
Belgium	Greece	The Netherlands
Croatia	Ireland	Portugal
Cyprus	Italy	Slovak Republic
Estonia	Latvia	Slovenia
Finland	Lithuania	Spain
France	Luxembourg	
Major Advanced Economies		
Canada	Italy	United States
France	Japan	
Germany	United Kingdom	
Other Advanced Economies		
Andorra	Israel	San Marino
Australia	Korea	Singapore
Czech Republic	Macao SAR ²	Sweden
Denmark	New Zealand	Switzerland
Hong Kong SAR ¹	Norway	Taiwan Province of China
Iceland	Puerto Rico	

¹On July 1, 1997, Hong Kong was returned to the People's Republic of China and became a Special Administrative Region of China.

²On December 20, 1999, Macao was returned to the People's Republic of China and became a Special Administrative Region of China.

Table C. European Union

Austria	France	Malta
Belgium	Germany	The Netherlands
Bulgaria	Greece	Poland
Croatia	Hungary	Portugal
Cyprus	Ireland	Romania
Czech Republic	Italy	Slovak Republic
Denmark	Latvia	Slovenia
Estonia	Lithuania	Spain
Finland	Luxembourg	Sweden

Table D. Emerging Market and Developing Economies by Region and Main Source of Export Earnings¹

	Fuel	Nonfuel Primary Products
Emerging and Developing Asia		
	Brunei Darussalam	Kiribati
	Timor-Leste	Marshall Islands
		Papua New Guinea
		Solomon Islands
		Tuvalu
Latin America and the Caribbean		
	Ecuador	Argentina
	Guyana	Bolivia
	Venezuela	Paraguay
		Peru
		Suriname
		Uruguay
Middle East and Central Asia		
	Algeria	Afghanistan
	Azerbaijan	Mauritania
	Bahrain	Somalia
	Iran	Sudan
	Iraq	Tajikistan
	Kazakhstan	
	Kuwait	
	Libya	
	Oman	
	Qatar	
	Saudi Arabia	
	Turkmenistan	
	United Arab Emirates	
	Yemen	
Sub-Saharan Africa		
	Angola	Benin
	Chad	Botswana
	Republic of Congo	Burkina Faso
	Equatorial Guinea	Burundi
	Gabon	Central African Republic
	Nigeria	Democratic Republic of the Congo
	South Sudan	Eritrea
		Ghana
		Guinea
		Guinea-Bissau
		Liberia
		Malawi
		Mali
		Sierra Leone
		South Africa
		Zambia
		Zimbabwe

¹Emerging and Developing Europe is omitted because no economies in the group have fuel or nonfuel primary products as the main source of export earnings.

Table E. Emerging Market and Developing Economies by Region, Net External Position, Heavily Indebted Poor Countries, and Per Capita Income Classification

	Net External Position ¹	Heavily Indebted Poor Countries ²	Per Capita Income Classification ³		Net External Position ¹	Heavily Indebted Poor Countries ²	Per Capita Income Classification ³
Emerging and Developing Asia				Poland	*		●
Bangladesh	*		*	Romania	*		●
Bhutan	*		*	Russia	●		●
Brunei Darussalam	●		●	Serbia	*		●
Cambodia	*		*	Türkiye	*		●
China	●		●	Ukraine	*		●
Fiji	*		●	Latin America and the Caribbean			
India	*		●	Antigua and Barbuda	*		●
Indonesia	*		●	Argentina	●		●
Kiribati	●		*	Aruba	*		●
Lao P.D.R.	*		*	The Bahamas	*		●
Malaysia	●		●	Barbados	*		●
Maldives	*		●	Belize	*		●
Marshall Islands	●		●	Bolivia	*	●	●
Micronesia	●		●	Brazil	*		●
Mongolia	*		●	Chile	*		●
Myanmar	*		*	Colombia	*		●
Nauru	●		●	Costa Rica	*		●
Nepal	*		*	Dominica	*		●
Palau	*		●	Dominican Republic	*		●
Papua New Guinea	*		*	Ecuador	*		●
Philippines	*		●	El Salvador	*		●
Samoa	*		●	Grenada	*		●
Solomon Islands	*		*	Guatemala	*		●
Sri Lanka	*		●	Guyana	*	●	●
Thailand	*		●	Haiti	*	●	*
Timor-Leste	●		*	Honduras	*	●	*
Tonga	*		●	Jamaica	*		●
Tuvalu	●		●	Mexico	*		●
Vanuatu	*		●	Nicaragua	*	●	*
Vietnam	*		*	Panama	*		●
Emerging and Developing Europe				Paraguay	*		●
Albania	*		●	Peru	*		●
Belarus	*		●	St. Kitts and Nevis	*		●
Bosnia and Herzegovina	*		●	St. Lucia	*		●
Bulgaria	*		●	St. Vincent and the Grenadines	*		●
Hungary	*		●	Suriname	*		●
Kosovo	*		●	Trinidad and Tobago	●		●
Moldova	*		*	Uruguay	*		●
Montenegro	*		●	Venezuela	●		●
North Macedonia	*		●				

Table E. Emerging Market and Developing Economies by Region, Net External Position, Heavily Indebted Poor Countries, and Per Capita Income Classification (continued)

	Net External Position ¹	Heavily Indebted Poor Countries ²	Per Capita Income Classification ³		Net External Position ¹	Heavily Indebted Poor Countries ²	Per Capita Income Classification ³
Middle East and Central Asia				Cameroon	*	●	*
Afghanistan	●	●	*	Central African Republic	*	●	*
Algeria	●		●	Chad	*	●	*
Armenia	*		●	Comoros	*	●	*
Azerbaijan	●		●	Democratic Republic of the Congo	*	●	*
Bahrain	●		●	Republic of Congo	*	●	*
Djibouti	*		*	Côte d'Ivoire	*	●	*
Egypt	*		●	Equatorial Guinea	●		●
Georgia	*		●	Eritrea	●	*	*
Iran	●		●	Eswatini	●		●
Iraq	●		●	Ethiopia	*	●	*
Jordan	*		●	Gabon	●		●
Kazakhstan	*		●	The Gambia	*	●	*
Kuwait	●		●	Ghana	*	●	*
Kyrgyz Republic	*		*	Guinea	*	●	*
Lebanon	*		●	Guinea-Bissau	*	●	*
Libya	●		●	Kenya	*		*
Mauritania	*	●	*	Lesotho	*		*
Morocco	*		●	Liberia	*	●	*
Oman	*		●	Madagascar	*	●	*
Pakistan	*		●	Malawi	*	●	*
Qatar	●		●	Mali	*	●	*
Saudi Arabia	●		●	Mauritius	●		●
Somalia	*	*	*	Mozambique	*	●	*
Sudan	*	*	*	Namibia	●		●
Syria ⁴	Niger	*	●	*
Tajikistan	*		*	Nigeria	*		*
Tunisia	*		●	Rwanda	*	●	*
Turkmenistan	●		●	São Tomé and Príncipe	*	●	*
United Arab Emirates	●		●	Senegal	*	●	*
Uzbekistan	●		*	Seychelles	*		●
West Bank and Gaza	*		●	Sierra Leone	*	●	*
Yemen	*		*	South Africa	●		●
Sub-Saharan Africa				South Sudan	*		*
Angola	*		●	Tanzania	*	●	*
Benin	*	●	*	Togo	*	●	*
Botswana	●		●	Uganda	*	●	*
Burkina Faso	*	●	*	Zambia	*	●	*
Burundi	*	●	*	Zimbabwe	*		*
Cabo Verde	*		●				

¹Dot (star) indicates that the country is a net creditor (net debtor).

²Dot instead of star indicates that the country has reached the completion point, which allows it to receive the full debt relief committed to at the decision point.

³Dot (star) indicates that the country is classified as an emerging market and middle-income economy (low-income developing country).

⁴Syria is omitted from the net external position group and per capita income classification group composites for lack of a fully developed database.

Table F. Economies with Exceptional Reporting Periods¹

	National Accounts	Government Finance
The Bahamas		Jul/Jun
Bangladesh	Jul/Jun	Jul/Jun
Barbados		Apr/Mar
Bhutan	Jul/Jun	Jul/Jun
Botswana		Apr/Mar
Dominica		Jul/Jun
Egypt	Jul/Jun	Jul/Jun
Eswatini		Apr/Mar
Ethiopia	Jul/Jun	Jul/Jun
Fiji		Aug/Jul
Haiti	Oct/Sep	Oct/Sep
Hong Kong SAR		Apr/Mar
India	Apr/Mar	Apr/Mar
Iran	Apr/Mar	Apr/Mar
Jamaica		Apr/Mar
Lesotho	Apr/Mar	Apr/Mar
Marshall Islands	Oct/Sep	Oct/Sep
Mauritius		Jul/Jun
Micronesia	Oct/Sep	Oct/Sep
Myanmar	Oct/Sep	Oct/Sep
Nauru	Jul/Jun	Jul/Jun
Nepal	Aug/Jul	Aug/Jul
Pakistan	Jul/Jun	Jul/Jun
Palau	Oct/Sep	Oct/Sep
Puerto Rico	Jul/Jun	Jul/Jun
St. Lucia		Apr/Mar
Samoa	Jul/Jun	Jul/Jun
Singapore		Apr/Mar
Thailand		Oct/Sep
Tonga	Jul/Jun	Jul/Jun
Trinidad and Tobago		Oct/Sep

¹Unless noted otherwise, all data refer to calendar years.

Table G. Key Data Documentation

Country	Currency	National Accounts				Prices (CPI)		
		Historical Data Source ¹	Latest Actual Annual Data	Base Year ²	System of National Accounts	Use of Chain-Weighted Methodology ³	Historical Data Source ¹	Latest Actual Annual Data
Afghanistan	Afghan afghani	NSO	2021	2016	SNA 2008		NSO	2022
Albania	Albanian lek	IMF staff	2022	1996	ESA 2010	From 1996	NSO	2022
Algeria	Algerian dinar	NSO	2022	2001	SNA 1993	From 2005	NSO	2022
Andorra	Euro	NSO	2022	2010	. . .		NSO	2022
Angola	Angolan kwanza	NSO and MEP	2022	2002	ESA 1995		NSO	2022
Antigua and Barbuda	Eastern Caribbean dollar	CB	2022	2006 ⁶	SNA 1993		NSO	2022
Argentina	Argentine peso	NSO	2022	2004	SNA 2008		NSO	2022
Armenia	Armenian dram	NSO	2022	2005	SNA 2008		NSO	2022
Aruba	Aruban florin	NSO	2021	2013	SNA 1993	From 2000	NSO	2022
Australia	Australian dollar	NSO	2022	2020	SNA 2008	From 1980	NSO	2022
Austria	Euro	NSO	2022	2015	ESA 2010	From 1995	NSO	2022
Azerbaijan	Azerbaijan manat	NSO	2022	2005	SNA 1993	From 1994	NSO	2022
The Bahamas	Bahamian dollar	NSO	2022	2018	SNA 1993		NSO	2022
Bahrain	Bahraini dinar	NSO and IMF staff	2022	2010	SNA 2008		NSO	2022
Bangladesh	Bangladesh taka	NSO	2021/22	2015/16	SNA 2008		NSO	2021/22
Barbados	Barbados dollar	NSO and CB	2022	2010	SNA 2008		NSO	2022
Belarus	Belarusian ruble	NSO	2022	2018	SNA 2008	From 2005	NSO	2022
Belgium	Euro	CB	2022	2015	ESA 2010	From 1995	CB	2022
Belize	Belize dollar	NSO	2021	2014	SNA 2008		NSO	2022
Benin	CFA franc	NSO	2022	2015	SNA 2008		NSO	2022
Bhutan	Bhutanese ngultrum	NSO	2020/21	1999/2000 ⁶	SNA 2008		NSO	2021/22
Bolivia	Bolivian boliviano	NSO	2022	1990	SNA 2008		NSO	2022
Bosnia and Herzegovina	Bosnian convertible marka	NSO	2022	2015	ESA 2010	From 2000	NSO	2022
Botswana	Botswana pula	NSO	2021	2016	SNA 2008		NSO	2022
Brazil	Brazilian real	NSO	2022	1995	SNA 2008		NSO	2022
Brunei Darussalam	Brunei dollar	MoF	2022	2010	SNA 2008		MoF	2022
Bulgaria	Bulgarian lev	NSO	2022	2015	ESA 2010	From 1996	NSO	2022
Burkina Faso	CFA franc	NSO and MEP	2021	2015	SNA 2008		NSO	2022
Burundi	Burundi franc	NSO and IMF staff	2022	2005	SNA 1993		NSO	2022
Cabo Verde	Cabo Verdean escudo	NSO	2021	2015	SNA 2008	From 2011	NSO	2021
Cambodia	Cambodian riel	NSO	2022	2000	SNA 1993		NSO	2022
Cameroon	CFA franc	NSO	2022	2016	SNA 2008	From 2016	NSO	2022
Canada	Canadian dollar	NSO	2022	2012	SNA 2008	From 1980	MoF and NSO	2022
Central African Republic	CFA franc	NSO	2021	2005	SNA 1993		NSO	2022
Chad	CFA franc	CB	2021	2005	SNA 1993		NSO	2021
Chile	Chilean peso	CB	2022	2018	SNA 2008	From 2003	NSO	2022
China	Chinese yuan	NSO	2022	2015	SNA 2008		NSO	2022
Colombia	Colombian peso	NSO	2022	2015	SNA 2008	From 2005	NSO	2022
Comoros	Comorian franc	NSO	2021	2007	SNA 1993		NSO	2021
Democratic Republic of the Congo	Congolese franc	NSO	2020	2005	SNA 1993	From 2005	NSO	2022
Republic of Congo	CFA franc	NSO	2020	2005	SNA 1993		NSO	2021
Costa Rica	Costa Rican colón	CB	2022	2017	SNA 2008		CB	2022

Table G. Key Data Documentation (continued)

Country	Government Finance					Balance of Payments		
	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage ⁴	Accounting Practice ⁵	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source
Afghanistan	MoF	2021	2001	CG	C	NSO, MoF, and CB	2020	BPM 6
Albania	IMF staff	2022	1986	CG,LG,SS,MPC, NFPC	...	CB	2022	BPM 6
Algeria	MoF	2022	1986	CG	C	CB	2022	BPM 6
Andorra	NSO and MoF	2022	...	CG,LG,SS	C	NSO	2020	BPM 6
Angola	MoF	2022	2001	CG,LG	...	CB	2022	BPM 6
Antigua and Barbuda	MoF	2022	2001	CG	Mixed	CB	2022	BPM 6
Argentina	MEP	2022	1986	CG,SG,SS	C	NSO	2022	BPM 6
Armenia	MoF	2022	2001	CG	C	CB	2022	BPM 6
Aruba	MoF	2021	2001	CG	Mixed	CB	2021	BPM 6
Australia	MoF	2021	2014	CG,SG,LG,TG	A	NSO	2021	BPM 6
Austria	NSO	2021	2014	CG,SG,LG,SS	A	CB	2022	BPM 6
Azerbaijan	MoF	2022	2001	CG	C	CB	2022	BPM 6
The Bahamas	MoF	2021/22	2014	CG	C	CB	2022	BPM 6
Bahrain	MoF	2022	2001	CG	C	CB	2022	BPM 6
Bangladesh	MoF	2021/22	...	CG	C	CB	2021/22	BPM 6
Barbados	MoF	2022/23	2001	BCG	C	CB	2022	BPM 6
Belarus	MoF	2022	2001	CG,LG,SS	C	CB	2022	BPM 6
Belgium	CB	2022	ESA 2010	CG,SG,LG,SS	A	CB	2022	BPM 6
Belize	MoF	2022	1986	CG,MPC	Mixed	CB	2022	BPM 6
Benin	MoF	2022	1986	CG	C	CB	2021	BPM 6
Bhutan	MoF	2021/22	1986	CG	C	CB	2020/21	BPM 6
Bolivia	MoF	2022	2001	CG,LG,SS,NMPC, NFPC	C	CB	2022	BPM 6
Bosnia and Herzegovina	MoF	2022	2014	CG,SG,LG,SS	Mixed	CB	2022	BPM 6
Botswana	MoF	2021/22	1986	CG	C	CB	2022	BPM 6
Brazil	MoF	2022	2014	CG,SG,LG,SS	C	CB	2022	BPM 6
Brunei Darussalam	MoF	2022	1986	CG,BCG	C	NSO and MEP	2022	BPM 6
Bulgaria	MoF	2022	2001	CG,LG,SS	C	CB	2022	BPM 6
Burkina Faso	MoF	2021	2001	CG	CB	CB	2021	BPM 6
Burundi	MoF	2022	2001	CG	Mixed	CB	2022	BPM 6
Cabo Verde	MoF	2021	2001	CG	A	NSO	2021	BPM 6
Cambodia	MoF	2021	2001	CG,LG	Mixed	CB	2022	BPM 5
Cameroon	MoF	2022	2001	CG,NFPC,NMPC	...	MoF	2022	BPM 6
Canada	MoF and NSO	2022	2001	CG,SG,LG,SS,other	A	NSO	2022	BPM 6
Central African Republic	MoF	2021	2001	CG	C	CB	2021	BPM 5
Chad	MoF	2021	1986	CG,NFPC	C	CB	2021	BPM 5
Chile	MoF	2022	2001	CG,LG	A	CB	2022	BPM 6
China	MoF	2022	...	CG,LG,SS	C	GAD	2022	BPM 6
Colombia	MoF	2022	2001	CG,SG,LG,SS	...	CB and NSO	2022	BPM 6
Comoros	MoF	2021	1986	CG	Mixed	CB and IMF staff	2021	BPM 5
Democratic Republic of the Congo	MoF	2022	2001	CG,LG	A	CB	2022	BPM 6
Republic of Congo	MoF	2021	2001	CG	A	CB	2020	BPM 6
Costa Rica	MoF and CB	2022	1986	CG	C	CB	2022	BPM 6

Table G. Key Data Documentation (continued)

Country	Currency	National Accounts					Prices (CPI)	
		Historical Data Source ¹	Latest Actual Annual Data	Base Year ²	System of National Accounts	Use of Chain-Weighted Methodology ³	Historical Data Source ¹	Latest Actual Annual Data
Côte d'Ivoire	CFA franc	NSO	2020	2015	SNA 2008	From 2015	NSO	2022
Croatia	Euro	NSO	2022	2015	ESA 2010		NSO	2022
Cyprus	Euro	NSO	2022	2010	ESA 2010	From 1995	NSO	2022
Czech Republic	Czech koruna	NSO	2022	2015	ESA 2010	From 1995	NSO	2022
Denmark	Danish krone	NSO	2022	2010	ESA 2010	From 1980	NSO	2022
Djibouti	Djibouti franc	NSO	2022	2013	SNA 2008		NSO	2022
Dominica	Eastern Caribbean dollar	NSO	2021	2006	SNA 1993		NSO	2021
Dominican Republic	Dominican peso	CB	2022	2007	SNA 2008	From 2007	CB	2022
Ecuador	US dollar	CB	2022	2007	SNA 2008		NSO and CB	2022
Egypt	Egyptian pound	MEP	2021/22	2021/22	SNA 2008		NSO	2021/22
El Salvador	US dollar	CB	2022	2014	SNA 2008		NSO	2022
Equatorial Guinea	CFA franc	MEP and CB	2021	2006	SNA 1993		MEP	2022
Eritrea	Eritrean nakfa	IMF staff	2019	2011	SNA 1993		IMF staff	2019
Estonia	Euro	NSO	2022	2015	ESA 2010	From 2010	NSO	2022
Eswatini	Swazi lilangeni	NSO	2021	2011	SNA 2008		NSO	2022
Ethiopia	Ethiopian birr	NSO	2021/22	2015/16	SNA 2008		NSO	2022
Fiji	Fijian dollar	NSO	2022	2014	SNA 2008		NSO	2022
Finland	Euro	NSO	2022	2015	ESA 2010	From 1980	NSO	2022
France	Euro	NSO	2022	2014	ESA 2010	From 1980	NSO	2022
Gabon	CFA franc	MEP	2021	2001	SNA 1993		NSO	2022
The Gambia	Gambian dalasi	NSO	2021	2013	SNA 2008		NSO	2022
Georgia	Georgian lari	NSO	2022	2015	SNA 2008	From 1996	NSO	2022
Germany	Euro	NSO	2022	2015	ESA 2010	From 1991	NSO	2022
Ghana	Ghanaian cedi	NSO	2022	2013	SNA 2008		NSO	2022
Greece	Euro	NSO	2022	2015	ESA 2010	From 1995	NSO	2022
Grenada	Eastern Caribbean dollar	NSO	2021	2006	SNA 1993		NSO	2021
Guatemala	Guatemalan quetzal	CB	2022	2013	SNA 2008	From 2001	NSO	2022
Guinea	Guinean franc	NSO	2021	2010	SNA 1993		NSO	2022
Guinea-Bissau	CFA franc	NSO	2021	2015	SNA 2008		NSO	2021
Guyana	Guyanese dollar	NSO	2021	2012 ⁶	SNA 1993		NSO	2021
Haiti	Haitian gourde	NSO	2020/21	2011/12	SNA 2008		NSO	2021/22
Honduras	Honduran lempira	CB	2022	2000	SNA 1993		CB	2022
Hong Kong SAR	Hong Kong dollar	NSO	2022	2021	SNA 2008	From 1980	NSO	2022
Hungary	Hungarian forint	NSO	2022	2015	ESA 2010	From 1995	NSO	2022
Iceland	Icelandic króna	NSO	2022	2015	ESA 2010	From 1990	NSO	2022
India	Indian rupee	NSO	2022/23	2011/12	SNA 2008		NSO	2022/23
Indonesia	Indonesian rupiah	NSO	2022	2010	SNA 2008		NSO	2022
Iran	Iranian rial	CB	2022/23	2016/17	SNA 2008		CB	2022/23
Iraq	Iraqi dinar	NSO	2022	2007	...		NSO	2022
Ireland	Euro	NSO	2022	2021	ESA 2010	From 1995	NSO	2022
Israel	Israeli new shekel	NSO	2022	2015	SNA 2008	From 1995	NSO	2022
Italy	Euro	NSO	2022	2015	ESA 2010	From 1980	NSO	2022
Jamaica	Jamaican dollar	NSO	2022	2007	SNA 1993		NSO	2022

Table G. Key Data Documentation (continued)

Country	Government Finance					Balance of Payments		
	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage ⁴	Accounting Practice ⁵	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source
Côte d'Ivoire	MoF	2022	1986	CG	A	CB	2021	BPM 6
Croatia	MoF	2022	2014	CG,LG	A	CB	2022	BPM 6
Cyprus	NSO	2022	ESA 2010	CG,LG,SS	A	CB	2022	BPM 6
Czech Republic	MoF	2022	2014	CG,LG,SS	A	NSO	2022	BPM 6
Denmark	NSO	2021	2014	CG,LG,SS	A	NSO	2022	BPM 6
Djibouti	MoF	2022	2001	CG	A	CB	2021	BPM 5
Dominica	MoF	2021/22	1986	CG	C	CB	2021	BPM 6
Dominican Republic	MoF	2022	2014	CG,LG,SS,NFPC	A	CB	2022	BPM 6
Ecuador	MoF	2022	2014	CG,SG,LG,SS,NFPC	Mixed	CB	2022	BPM 6
Egypt	MoF	2021/22	2001	CG,LG,SS,MPC	C	CB	2021/22	BPM 5
El Salvador	MoF and CB	2022	1986	CG,LG,SS,NFPC	C	CB	2022	BPM 6
Equatorial Guinea	MoF and MEP	2021	1986	CG	C	CB	2017	BPM 5
Eritrea	IMF staff	2019	2001	CG	C	IMF staff	2019	BPM 5
Estonia	MoF	2022	1986/2001	CG,LG,SS	C	CB	2022	BPM 6
Eswatini	MoF	2021/22	2001	CG	A	CB	2022	BPM 6
Ethiopia	MoF	2021/22	1986	CG,SG,LG,NFPC	C	CB	2021/22	BPM 5
Fiji	MoF	2021/22	1986	CG	C	CB	2021	BPM 6
Finland	MoF	2022	2014	CG,LG,SS	A	NSO	2022	BPM 6
France	NSO	2022	2014	CG,LG,SS	A	CB	2022	BPM 6
Gabon	IMF staff	2021	2001	CG	A	IMF staff	2019	BPM 5
The Gambia	MoF	2022	1986	CG	C	CB and IMF staff	2021	BPM 6
Georgia	MoF	2022	2001	CG,LG	C	CB	2022	BPM 6
Germany	NSO	2022	ESA 2010	CG,SG,LG,SS	A	CB	2022	BPM 6
Ghana	MoF	2022	2001	CG	CB	CB	2022	BPM 5
Greece	NSO	2022	ESA 2010	CG,LG,SS	A	CB	2022	BPM 6
Grenada	MoF	2022	...	CG	CB	NSO and CB	2022	BPM 6
Guatemala	MoF	2022	2001	CG	C	CB	2022	BPM 6
Guinea	MoF	2021	1986	CG	C	CB and MEP	2021	BPM 6
Guinea-Bissau	MoF	2021	2001	CG	A	CB	2021	BPM 6
Guyana	MoF	2021	1986	CG,SS,NFPC	C	CB	2021	BPM 6
Haiti	MoF	2021/22	1986	CG	C	CB	2020/21	BPM 5
Honduras	MoF	2022	2014	CG,LG,SS,other	Mixed	CB	2022	BPM 5
Hong Kong SAR	MoF	2021/22	2001	CG	C	NSO	2022	BPM 6
Hungary	MEP and NSO	2022	ESA 2010	CG,LG,SS,NMPC	A	CB	2022	BPM 6
Iceland	NSO	2022	2001	CG,LG,SS	A	CB	2022	BPM 6
India	MoF and IMF staff	2020/21	1986	CG,SG	C	CB	2022/23	BPM 6
Indonesia	MoF	2022	2014	CG,LG	A	CB	2022	BPM 6
Iran	MoF	2020/21	2001	CG	C	CB and IMF staff	2022/23	BPM 5
Iraq	MoF	2022	2001	CG	C	CB	2022	BPM 6
Ireland	MoF and NSO	2022	2001	CG,LG,SS	A	NSO	2021	BPM 6
Israel	MoF and NSO	2022	2014	CG,LG,SS	...	NSO	2022	BPM 6
Italy	NSO	2022	2001	CG,LG,SS	A	NSO	2022	BPM 6
Jamaica	MoF	2022/23	1986	CG	C	CB	2022	BPM 6

Table G. Key Data Documentation (continued)

Country	Currency	National Accounts				Prices (CPI)		
		Historical Data Source ¹	Latest Actual Annual Data	Base Year ²	System of National Accounts	Use of Chain-Weighted Methodology ³	Historical Data Source ¹	Latest Actual Annual Data
Japan	Japanese yen	GAD	2022	2015	SNA 2008	From 1980	GAD	2022
Jordan	Jordanian dinar	NSO	2021	2016	SNA 2008		NSO	2021
Kazakhstan	Kazakhstani tenge	NSO	2022	2005	SNA 1993	From 1994	NSO	2022
Kenya	Kenyan shilling	NSO	2022	2016	SNA 2008		NSO	2022
Kiribati	Australian dollar	NSO	2021	2006	SNA 2008		IMF staff	2022
Korea	South Korean won	CB	2022	2015	SNA 2008	From 1980	NSO	2022
Kosovo	Euro	NSO	2022	2016	ESA 2010		NSO	2022
Kuwait	Kuwaiti dinar	MEP and NSO	2020	2010	SNA 1993		NSO and MEP	2022
Kyrgyz Republic	Kyrgyz som	NSO	2022	2005	SNA 2008	From 2010	NSO	2022
Lao P.D.R.	Lao kip	NSO	2020	2012	SNA 2008		NSO	2022
Latvia	Euro	NSO	2022	2015	ESA 2010	From 1995	NSO	2022
Lebanon	Lebanese pound	NSO	2020	2010	SNA 2008	From 2010	NSO	2022
Lesotho	Lesotho loti	NSO	2020/21	2012/13	SNA 2008		NSO	2021
Liberia	US dollar	IMF staff	2021	2018	SNA 1993		CB	2021
Libya	Libyan dinar	MEP	2021	2013	SNA 1993		NSO	2022
Lithuania	Euro	NSO	2022	2015	ESA 2010	From 2005	NSO	2022
Luxembourg	Euro	NSO	2022	2015	ESA 2010	From 1995	NSO	2022
Macao SAR	Macanese pataca	NSO	2022	2021	SNA 2008	From 2001	NSO	2022
Madagascar	Malagasy ariary	NSO	2022	2007	SNA 1993		NSO	2022
Malawi	Malawian kwacha	NSO	2022	2017	SNA 2008		NSO	2022
Malaysia	Malaysian ringgit	NSO	2022	2015	SNA 2008		NSO	2022
Maldives	Maldivian rufiyaa	MoF and NSO	2022	2014	SNA 2008		CB	2022
Mali	CFA franc	NSO	2022	1999	SNA 1993		NSO	2022
Malta	Euro	NSO	2022	2015	ESA 2010	From 2000	NSO	2022
Marshall Islands	US dollar	NSO	2021/22	2014/15	SNA 2008		NSO	2021/22
Mauritania	New Mauritanian ouguiya	NSO	2021	1998	SNA 2008	From 2014	NSO	2021
Mauritius	Mauritian rupee	NSO	2022	2006	SNA 2008	From 1999	NSO	2022
Mexico	Mexican peso	NSO	2022	2018	SNA 2008		NSO	2022
Micronesia	US dollar	NSO	2017/18	2003/04	SNA 2008		NSO	2021/22
Moldova	Moldovan leu	NSO	2022	1995	SNA 2008		NSO	2022
Mongolia	Mongolian tögrög	NSO	2022	2015	SNA 2008		NSO	2022
Montenegro	Euro	NSO	2021	2006	ESA 2010		NSO	2022
Morocco	Moroccan dirham	NSO	2022	2014	SNA 2008	From 2007	NSO	2022
Mozambique	Mozambican metical	NSO	2022	2014	SNA 2008		NSO	2022
Myanmar	Myanmar kyat	MEP	2019/20	2015/16	...		NSO	2020/21
Namibia	Namibian dollar	NSO	2022	2015	SNA 1993		NSO	2022
Nauru	Australian dollar	IMF staff	2019/20	2006/07	SNA 2008		NSO and IMF staff	2020/21
Nepal	Nepalese rupee	NSO	2022/23	2010/11	SNA 2008		CB	2021/22
The Netherlands	Euro	NSO	2022	2015	ESA 2010	From 1980	NSO	2022
New Zealand	New Zealand dollar	NSO	2022	2009 ⁶	SNA 2008	From 1987	NSO and IMF staff	2022
Nicaragua	Nicaraguan córdoba	CB	2022	2006	SNA 2008	From 1994	CB	2022
Niger	CFA franc	NSO	2021	2015	SNA 2008		NSO	2022
Nigeria	Nigerian naira	NSO	2022	2010	SNA 2008		NSO	2022
North Macedonia	Macedonian denar	NSO	2022	2005	ESA 2010		NSO	2022
Norway	Norwegian krone	NSO	2022	2020	ESA 2010	From 1980	NSO	2022

Table G. Key Data Documentation (continued)

Country	Government Finance					Balance of Payments		
	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage ⁴	Accounting Practice ⁵	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source
Japan	GAD	2021	2014	CG,LG,SS	A	MoF	2022	BPM 6
Jordan	MoF	2021	2001	CG,NFPC	C	CB	2021	BPM 6
Kazakhstan	MoF	2022	2001	CG,LG	C	CB	2022	BPM 6
Kenya	MoF	2022	2001	CG	C	CB	2022	BPM 6
Kiribati	MoF	2021	1986	CG	C	NSO and IMF staff	2021	BPM 6
Korea	MoF	2022	2001	CG,SS	C	CB	2022	BPM 6
Kosovo	MoF	2022	1986	CG,LG	C	CB	2022	BPM 6
Kuwait	MoF	2021	2014	CG,SS	Mixed	CB	2022	BPM 6
Kyrgyz Republic	MoF	2022	. . .	CG,LG,SS	C	CB	2022	BPM 6
Lao P.D.R.	MoF	2021	2001	CG	C	CB	2020	BPM 6
Latvia	MoF	2022	ESA 2010	CG,LG,SS	C	CB	2022	BPM 6
Lebanon	MoF	2021	2001	CG	C	CB and IMF staff	2021	BPM 5
Lesotho	MoF	2021/22	2001	CG,LG	C	CB	2021/22	BPM 6
Liberia	MoF	2021	2001	CG	A	CB	2022	BPM 5
Libya	CB	2022	1986	CG,SG,LG	C	CB and IMF staff	2022	BPM 5
Lithuania	MoF	2022	2014	CG,LG,SS	A	CB	2022	BPM 6
Luxembourg	MoF	2022	2001	CG,LG,SS	A	NSO	2022	BPM 6
Macao SAR	MoF	2021	2014	CG,SS	C	NSO	2021	BPM 6
Madagascar	MoF	2022	1986	CG	CB	CB	2022	BPM 6
Malawi	MoF	2022	2014	CG	C	NSO and GAD	2021	BPM 6
Malaysia	MoF	2022	2001	CG,SG,LG	C	NSO	2022	BPM 6
Maldives	MoF	2022	1986	CG	C	CB	2022	BPM 6
Mali	MoF	2022	2001	CG	Mixed	CB	2021	BPM 6
Malta	NSO	2022	2001	CG,SS	A	NSO	2022	BPM 6
Marshall Islands	MoF	2021/22	2001	CG,LG,SS	A	NSO	2021/22	BPM 6
Mauritania	MoF	2021	1986	CG	C	CB	2021	BPM 6
Mauritius	MoF	2021/22	2001	CG,LG,NFPC	C	CB	2022	BPM 6
Mexico	MoF	2022	2014	CG,SS,NMPC,NFPC	C	CB	2022	BPM 6
Micronesia	MoF	2020/21	2001	CG,SG	. . .	NSO	2017/18	BPM 6
Moldova	MoF	2022	1986	CG,LG	C	CB	2022	BPM 6
Mongolia	MoF	2022	2001	CG,SG,LG,SS	C	CB	2022	BPM 6
Montenegro	MoF	2022	1986	CG,LG,SS	C	CB	2022	BPM 6
Morocco	MEP	2022	2001	CG	A	GAD	2022	BPM 6
Mozambique	MoF	2022	2001	CG,SG	Mixed	CB	2022	BPM 6
Myanmar	MoF	2019/20	2014	CG,NFPC	C	IMF staff	2021/22	BPM 6
Namibia	MoF	2022	2001	CG	C	CB	2022	BPM 6
Nauru	MoF	2020/21	2001	CG	Mixed	IMF staff	2021/22	BPM 6
Nepal	MoF	2021/22	2001	CG	C	CB	2021/22	BPM 5
The Netherlands	MoF	2022	2001	CG,LG,SS	A	CB	2022	BPM 6
New Zealand	NSO	2022	2014	CG,LG	A	NSO	2022	BPM 6
Nicaragua	MoF	2022	1986	CG,LG,SS	C	IMF staff	2021	BPM 6
Niger	MoF	2021	1986	CG	A	CB	2021	BPM 6
Nigeria	MoF	2022	2001	CG,SG,LG	C	CB	2022	BPM 6
North Macedonia	MoF	2022	1986	CG,SG,SS	C	CB	2022	BPM 6
Norway	NSO and MoF	2022	2014	CG,LG,SS	A	NSO	2022	BPM 6

Table G. Key Data Documentation (continued)

Country	Currency	National Accounts				Prices (CPI)		
		Historical Data Source ¹	Latest Actual Annual Data	Base Year ²	System of National Accounts	Use of Chain-Weighted Methodology ³	Historical Data Source ¹	Latest Actual Annual Data
Oman	Omani rial	NSO	2022	2018	SNA 2008		NSO	2022
Pakistan	Pakistan rupee	NSO	2021/22	2015/16	SNA 2008		NSO	2022/23
Palau	US dollar	MoF	2021/22	2018/19	SNA 1993		MoF	2021/22
Panama	US dollar	NSO	2022	2018	SNA 1993	From 2018	NSO	2022
Papua New Guinea	Papua New Guinea kina	NSO and MoF	2020	2013	SNA 2008		NSO	2022
Paraguay	Paraguayan guaraní	CB	2022	2014	SNA 2008		CB	2022
Peru	Peruvian sol	CB	2022	2007	SNA 2008		CB	2022
Philippines	Philippine peso	NSO	2022	2018	SNA 2008		NSO	2022
Poland	Polish zloty	NSO	2022	2015	ESA 2010	From 2015	NSO	2022
Portugal	Euro	NSO	2022	2016	ESA 2010	From 1980	NSO	2022
Puerto Rico	US dollar	NSO	2020/21	1954	...		NSO	2022
Qatar	Qatari riyal	NSO and MEP	2022	2018	SNA 1993		NSO and MEP	2022
Romania	Romanian leu	NSO	2022	2015	ESA 2010		NSO	2022
Russia	Russian ruble	NSO	2022	2021	SNA 2008	From 2000	NSO	2022
Rwanda	Rwandan franc	NSO	2021	2017	SNA 2008	From 1995	NSO	2021
Samoa	Samoa tala	NSO	2021/22	2012/13	SNA 2008		NSO	2021/22
San Marino	Euro	NSO	2021	2007	ESA 2010		NSO	2022
São Tomé and Príncipe	São Tomé and Príncipe dobra	NSO	2020	2008	SNA 1993		NSO	2020
Saudi Arabia	Saudi riyal	NSO	2022	2010	SNA 2008		NSO	2022
Senegal	CFA franc	NSO	2021	2014	SNA 2008		NSO	2021
Serbia	Serbian dinar	NSO	2022	2015	ESA 2010	From 2010	NSO	2022
Seychelles	Seychelles rupee	NSO	2021	2014	SNA 1993		NSO	2021
Sierra Leone	Sierra Leonean leone	NSO	2021	2006	SNA 2008	From 2010	NSO	2022
Singapore	Singapore dollar	NSO	2022	2015	SNA 2008	From 2015	NSO	2022
Slovak Republic	Euro	NSO	2022	2015	ESA 2010	From 1997	NSO	2022
Slovenia	Euro	NSO	2022	2010	ESA 2010	From 2000	NSO	2022
Solomon Islands	Solomon Islands dollar	CB	2020	2012	SNA 1993		NSO	2022
Somalia	US dollar	NSO	2022	2022	SNA 2008		NSO	2022
South Africa	South African rand	NSO	2022	2015	SNA 2008		NSO	2022
South Sudan	South Sudanese pound	NSO and IMF staff	2021	2010	SNA 1993		NSO	2022
Spain	Euro	NSO	2022	2015	ESA 2010	From 1995	Other	2022
Sri Lanka	Sri Lankan rupee	NSO	2021	2015	SNA 2008		NSO	2021
St. Kitts and Nevis	Eastern Caribbean dollar	NSO	2022	2006	SNA 1993		NSO	2022
St. Lucia	Eastern Caribbean dollar	NSO	2022	2018	SNA 2008		NSO	2022
St. Vincent and the Grenadines	Eastern Caribbean dollar	NSO	2021	2018	SNA 1993		NSO	2022
Sudan	Sudanese pound	NSO	2019	1982	...		NSO	2022
Suriname	Surinamese dollar	NSO	2021	2015	SNA 2008		NSO	2021

Table G. Key Data Documentation (continued)

Country	Government Finance					Balance of Payments		
	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage ⁴	Accounting Practice ⁵	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source
Oman	MoF	2022	2001	CG	C	CB	2021	BPM 6
Pakistan	MoF	2022/23	1986	CG,SG,LG	C	CB	2022/23	BPM 6
Palau	MoF	2021/22	2001	CG	...	MoF	2020/21	BPM 6
Panama	MoF	2022	2014	CG,SG,LG,SS,NFPC	C	NSO	2022	BPM 6
Papua New Guinea	MoF	2022	2014	CG	C	CB	2022	BPM 6
Paraguay	MoF	2022	2001	CG,SG,LG,SS,MPC	C	CB	2022	BPM 6
Peru	CB and MoF	2022	2001	CG,SG,LG,SS	Mixed	CB	2022	BPM 5
Philippines	MoF	2022	2014	CG,LG,SS	C	CB	2022	BPM 6
Poland	MoF and NSO	2022	ESA 2010	CG,LG,SS	A	CB	2022	BPM 6
Portugal	NSO	2022	2001	CG,LG,SS	A	CB	2022	BPM 6
Puerto Rico	MEP	2021/22	2001	...	A	...	...	...
Qatar	MoF	2022	1986	CG,other	C	CB and IMF staff	2022	BPM 6
Romania	MoF	2022	2001	CG,LG,SS	C	CB	2022	BPM 6
Russia	MoF	2022	2014	CG,SG,SS	Mixed	CB	2022	BPM 6
Rwanda	MoF	2021	2014	CG	Mixed	CB	2021	BPM 6
Samoa	MoF	2021/22	2001	CG	A	CB	2021/22	BPM 6
San Marino	MoF	2022	...	CG	...	Other	2021	BPM 6
São Tomé and Príncipe	MoF and Customs	2020	2001	CG	C	CB	2020	BPM 6
Saudi Arabia	MoF	2022	2014	CG	C	CB	2022	BPM 6
Senegal	MoF	2021	2001	CG	C	CB and IMF staff	2021	BPM 6
Serbia	MoF	2022	2014	CG,SG,LG,SS,other	C	CB	2022	BPM 6
Seychelles	MoF	2021	2001	CG,SS	C	CB	2021	BPM 6
Sierra Leone	MoF	2022	1986	CG	C	CB	2021	BPM 6
Singapore	MoF and NSO	2022/23	2014	CG	C	NSO	2022	BPM 6
Slovak Republic	NSO	2022	2001	CG,LG,SS	A	CB	2022	BPM 6
Slovenia	MoF	2022	2001	CG,LG,SS	A	CB	2022	BPM 6
Solomon Islands	MoF	2022	1986	CG	C	CB	2022	BPM 6
Somalia	MoF	2022	2001	CG	C	CB and IMF staff	2022	BPM 5
South Africa	MoF	2022	2001	CG,SG,SS,other	C	CB	2022	BPM 6
South Sudan	MoF and MEP	2021	...	CG	C	MoF, NSO, MEP, and IMF staff	2021	BPM 6
Spain	MoF and NSO	2022	ESA 2010	CG,SG,LG,SS	A	CB	2022	BPM 6
Sri Lanka	MoF	2021	1986	CG	C	CB	2021	BPM 6
St. Kitts and Nevis	MoF	2022	1986	CG,SG	C	CB	2021	BPM 6
St. Lucia	MoF	2022/23	1986	CG	C	CB	2022	BPM 6
St. Vincent and the Grenadines	MoF	2022	1986	CG	C	CB	2022	BPM 6
Sudan	MoF	2021	2001	CG	Mixed	CB	2021	BPM 6
Suriname	MoF	2021	1986	CG	Mixed	CB	2021	BPM 6

Table G. Key Data Documentation (continued)

Country	Currency	National Accounts				Prices (CPI)		
		Historical Data Source ¹	Latest Actual Annual Data	Base Year ²	System of National Accounts	Use of Chain-Weighted Methodology ³	Historical Data Source ¹	Latest Actual Annual Data
Sweden	Swedish krona	NSO	2022	2022	ESA 2010	From 1993	NSO	2022
Switzerland	Swiss franc	NSO	2022	2015	ESA 2010	From 1980	NSO	2022
Syria	Syrian pound	NSO	2010	2000	SNA 1993		NSO	2011
Taiwan Province of China	New Taiwan dollar	NSO	2022	2016	SNA 2008		NSO	2022
Tajikistan	Tajik somoni	NSO	2022	1995	SNA 1993		NSO	2022
Tanzania	Tanzanian shilling	NSO	2021	2015	SNA 2008		NSO	2022
Thailand	Thai baht	MEP	2022	2002	SNA 1993	From 1993	MEP	2022
Timor-Leste	US dollar	NSO	2022	2015	SNA 2008		NSO	2022
Togo	CFA franc	NSO	2021	2016	SNA 2008		NSO	2021
Tonga	Tongan pa'anga	CB	2021/22	2016/17	SNA 2008		CB	2021/22
Trinidad and Tobago	Trinidad and Tobago dollar	NSO	2022	2012	SNA 2008		NSO	2022
Tunisia	Tunisian dinar	NSO	2022	2015	SNA 1993	From 2009	NSO	2022
Türkiye	Turkish lira	NSO	2022	2009	ESA 2010	From 2009	NSO	2022
Turkmenistan	New Turkmen manat	IMF staff	2022	2006	SNA 2008	From 2007	NSO	2022
Tuvalu	Australian dollar	PFTAC advisors	2021	2016	SNA 1993		NSO	2022
Uganda	Ugandan shilling	NSO	2022	2016	SNA 2008		CB	2022
Ukraine	Ukrainian hryvnia	NSO	2022	2016	SNA 2008	From 2005	NSO	2022
United Arab Emirates	U.A.E. dirham	NSO	2022	2010	SNA 2008		NSO	2022
United Kingdom	British pound	NSO	2022	2019	ESA 2010	From 1980	NSO	2022
United States	US dollar	NSO	2022	2012	SNA 2008	From 1980	NSO	2022
Uruguay	Uruguayan peso	CB	2022	2016	SNA 2008		NSO	2022
Uzbekistan	Uzbek som	NSO	2022	2020	SNA 1993		NSO and IMF staff	2022
Vanuatu	Vanuatu vatu	NSO	2020	2006	SNA 1993		NSO	2022
Venezuela	Venezuelan bolívar	CB	2018	1997	SNA 1993		CB	2022
Vietnam	Vietnamese dong	NSO	2022	2010	SNA 1993		NSO	2022
West Bank and Gaza	Israeli new shekel	NSO	2022	2015	SNA 2008		NSO	2022
Yemen	Yemeni rial	IMF staff	2022	1990	SNA 1993		NSO, CB, and IMF staff	2022
Zambia	Zambian kwacha	NSO	2021	2010	SNA 2008		NSO	2021
Zimbabwe	Zimbabwe dollar	NSO	2022	2019	SNA 2008		NSO	2022

Table G. Key Data Documentation (continued)

Country	Government Finance					Balance of Payments		
	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage ⁴	Accounting Practice ⁵	Historical Data Source ¹	Latest Actual Annual Data	Statistics Manual in Use at Source
Sweden	MoF	2021	2001	CG,LG,SS	A	NSO	2022	BPM 6
Switzerland	MoF	2022	2001	CG,SG,LG,SS	A	CB	2022	BPM 6
Syria	MoF	2009	1986	CG	C	CB	2009	BPM 5
Taiwan Province of China	MoF	2022	2001	CG,LG,SS	C	CB	2022	BPM 6
Tajikistan	MoF	2022	1986	CG,LG,SS	C	CB	2022	BPM 6
Tanzania	MoF	2021	1986	CG,LG	C	CB	2021	BPM 6
Thailand	MoF	2021/22	2001	CG,BCG,LG,SS	A	CB	2022	BPM 6
Timor-Leste	MoF	2022	2001	CG	C	CB	2021	BPM 6
Togo	MoF	2021	2001	CG	C	CB	2021	BPM 6
Tonga	MoF	2020/21	2014	CG	C	CB and NSO	2020/21	BPM 6
Trinidad and Tobago	MoF	2022/23	1986	CG	C	CB	2022	BPM 6
Tunisia	MoF	2022	1986	CG	C	CB	2022	BPM 5
Türkiye	MoF	2022	2001	CG,LG,SS,other	A	CB	2022	BPM 6
Turkmenistan	MoF	2022	1986	CG,LG	C	NSO	2022	BPM 6
Tuvalu	MoF	2022	...	CG	Mixed	IMF staff	2021	BPM 6
Uganda	MoF	2022	2001	CG	C	CB	2022	BPM 6
Ukraine	MoF	2022	2001	CG,LG,SS	C	CB	2022	BPM 6
United Arab Emirates	MoF	2022	2014	CG,BCG,SG,SS	Mixed	CB	2021	BPM 5
United Kingdom	NSO	2022	2001	CG,LG	A	NSO	2022	BPM 6
United States	MEP	2022	2014	CG,SG,LG	A	NSO	2022	BPM 6
Uruguay	MoF	2022	1986	CG,LG,SS,NFPC, NMPC	C	CB	2022	BPM 6
Uzbekistan	MoF	2022	2014	CG,SG,LG,SS	C	CB and MEP	2022	BPM 6
Vanuatu	MoF	2020	2001	CG	C	CB	2021	BPM 6
Venezuela	MoF	2017	2001	BCG,NFPC,SS,other	C	CB	2018	BPM 6
Vietnam	MoF	2021	2001	CG,SG,LG	C	CB	2022	BPM 6
West Bank and Gaza	MoF	2022	2001	CG	Mixed	NSO	2022	BPM 6
Yemen	MoF	2022	2001	CG,LG	C	IMF staff	2022	BPM 5
Zambia	MoF	2022	1986	CG	C	CB	2022	BPM 6
Zimbabwe	MoF	2021	1986	CG	C	CB and MoF	2022	BPM 6

Note: BPM = Balance of Payments Manual; CPI = consumer price index; ESA = European System of National Accounts; SNA = System of National Accounts.

¹CB = central bank; Customs = Customs Authority; GAD = General Administration Department; MEP = Ministry of Economy, Planning, Commerce, and/or Development; MoF = Ministry of Finance and/or Treasury; NSO = National Statistics Office; PFTAC = Pacific Financial Technical Assistance Centre.

²National accounts base year is the period with which other periods are compared and the period for which prices appear in the denominators of the price relationships used to calculate the index.

³Use of chain-weighted methodology allows countries to measure GDP growth more accurately by reducing or eliminating the downward biases in volume series built on index numbers that average volume components using weights from a year in the moderately distant past.

⁴BCG = budgetary central government; CG = central government; LG = local government; MPC = monetary public corporation, including central bank; NFPC = nonfinancial public corporation; NMPC = nonmonetary financial public corporation; SG = state government; SS = social security fund; TG = territorial governments.

⁵Accounting standard: A = accrual accounting; C = cash accounting; CB = commitment basis accounting; Mixed = combination of accrual and cash accounting.

⁶Base year deflator is not equal to 100 because the nominal GDP is not measured in the same way as real GDP or the data are seasonally adjusted.

Box A1. Economic Policy Assumptions underlying the Projections for Selected Economies

Fiscal Policy Assumptions

The short-term fiscal policy assumptions used in the *World Economic Outlook* (WEO) are normally based on officially announced budgets, adjusted for differences between the national authorities and the IMF staff regarding macroeconomic assumptions and projected fiscal outturns. When no official budget has been announced, projections incorporate policy measures judged likely to be implemented. The medium-term fiscal projections are similarly based on a judgment about policies' most likely path. For cases in which the IMF staff has insufficient information to assess the authorities' budget intentions and prospects for policy implementation, an unchanged structural primary balance is assumed unless indicated otherwise. Specific assumptions used in regard to some of the advanced economies follow. (See also Tables B5 to B9 in the online section of the Statistical Appendix for data on fiscal net lending/borrowing and structural balances.)¹

Argentina: Fiscal projections are based on the available information regarding budget outturn, budget plans, and IMF-supported program targets for the federal government; on fiscal measures announced by the authorities; and on IMF staff macroeconomic projections.

Australia: Fiscal projections are based on data from the Australian Bureau of Statistics, the fiscal year (FY)2023/24 budgets published by the Commonwealth government and the respective

state/territory governments, and the IMF staff's estimates and projections.

Austria: Fiscal projections are based on the 2023 budget and the April 2023 Austria Stability Programme. The NextGenerationEU fund and the latest announcement on fiscal measures have also been incorporated.

Belgium: Projections are based on the Belgian Stability Programme 2023–26, the 2023 Budgetary Plan, and other available information on the authorities' fiscal plans, with adjustments for the IMF staff's assumptions.

Brazil: Fiscal projections for 2023 reflect current policies in place.

Canada: Projections use the baseline forecasts from the Government of Canada's 2023 budget and the latest provincial budgets. The IMF staff makes some adjustments to these forecasts, including those for differences in macroeconomic projections. The IMF staff's forecast also incorporates the most recent data releases from Statistics Canada's National Economic Accounts, including quarterly federal, provincial, and territorial budgetary outturns.

Chile: Projections are based on the authorities' budget projections, adjusted to reflect the IMF staff's projections for GDP, copper prices, depreciation, and inflation.

China: Staff fiscal projections incorporate the 2023 budget as well as estimates of off-budget financing.

Denmark: Estimates for the current year are aligned with the latest official budget numbers, adjusted where appropriate for the IMF staff's macroeconomic assumptions. Beyond the current year, the projections incorporate key features of the medium-term fiscal plan as embodied in the authorities' latest budget. Structural balances are net of temporary fluctuations in some revenues (for example, North Sea revenue, pension yield tax revenue) and one-offs (COVID-19-related one-offs are, however, included).

France: Projections for 2023 onward are based on the 2018–23 budget laws, Stability Programme 2023–27, draft medium-term programming bill, and other available information on the authorities' fiscal plans, adjusted for differences in revenue

¹The output gap is actual minus potential output, as a percentage of potential output. Structural balances are expressed as a percentage of potential output. The structural balance is the actual net lending/borrowing minus the effects of cyclical output from potential output, corrected for one-time and other factors, such as asset and commodity prices and output composition effects. Changes in the structural balance consequently include effects of temporary fiscal measures, the impact of fluctuations in interest rates and debt-service costs, and other noncyclical fluctuations in net lending/borrowing. The computations of structural balances are based on the IMF staff's estimates of potential GDP and revenue and expenditure elasticities. (See Annex I of the October 1993 WEO.) Estimates of the output gap and of the structural balance are subject to significant margins of uncertainty. Net debt is calculated as gross debt minus financial assets corresponding to debt instruments.

Box A1 (continued)

projections and assumptions on macroeconomic and financial variables.

Germany: The IMF staff's projections for 2023 and beyond are based on the 2023 budget, the 2023 Stability Programme, the draft 2024 federal budget, the federal government's medium-term budget plan, and data updates from the national statistical agency (Destatis) and the ministry of finance, adjusted for differences in the IMF staff's macroeconomic framework and assumptions concerning revenue elasticities.

Greece: Data since 2010 reflect adjustments in line with the primary balance definition under the enhanced surveillance framework for Greece.

Hong Kong Special Administrative Region: Projections are based on the authorities' medium-term fiscal projections for expenditures.

Hungary: Fiscal projections include the IMF staff's projections for the macroeconomic framework and fiscal policy plans announced in the 2023 budget.

India: Projections are based on available information on the authorities' fiscal plans, with adjustments for the IMF staff's assumptions. Subnational data are incorporated with a lag of up to one year; general government data are thus finalized well after central government data. IMF and Indian presentations differ, particularly regarding disinvestment and license-auction proceeds, net versus gross recording of revenues in certain minor categories, and some public sector lending. Starting with FY2020/21 data, expenditure also includes the off-budget component of food subsidies, consistent with the revised treatment of food subsidies in the budget. The IMF staff adjusts expenditure to take out payments for previous years' food subsidies, which are included as expenditure in budget estimates for FY2020/21.

Indonesia: The IMF staff's projections are based on maintaining a neutral fiscal stance going forward, accompanied by moderate tax policy and administration reforms, some expenditure realization, and a gradual increase in capital spending over the medium term in line with fiscal space.

Ireland: Fiscal projections are based on the country's Budget 2023.

Italy: The IMF staff's estimates and projections are informed by the fiscal plans included in the government's 2023 budget and amendments. The stock of maturing postal bonds is included in the debt projections.

Japan: The projections reflect fiscal measures the government has already announced, with adjustments for the IMF staff's assumptions.

Korea: The forecast incorporates the overall fiscal balance in the 2022 annual budget and two supplementary budgets, the proposed 2023 budget and medium-term fiscal plan, and the IMF staff's adjustments.

Mexico: The 2020 public sector borrowing requirements estimated by the IMF staff adjust for some statistical discrepancies between above-the-line and below-the-line numbers. Fiscal projections for 2023 and 2024 are informed by the estimates in *Criteria 2024*; projections for 2025 onward assume continued compliance with rules established in the Federal Budget and Fiscal Responsibility Law.

The Netherlands: Fiscal projections for 2023–28 are based on the IMF staff's forecast framework and are also informed by the authorities' draft budget plan and Bureau for Economic Policy Analysis projections.

New Zealand: Fiscal projections are based on the FY2023/24 budget (May 2023) and the IMF staff's estimates.

Portugal: The projections for the current year are based on the authorities' approved budget, adjusted to reflect the IMF staff's macroeconomic forecast. Projections thereafter are based on the assumption of unchanged policies. Projections for 2023 reflect information available in the 2023 budget proposal.

Puerto Rico: Fiscal projections are informed by the Certified Fiscal Plan for the Commonwealth of Puerto Rico, which was prepared in April 2023, certified by the Financial Oversight and Management Board.

Russia: The fiscal rule was suspended last year by the government in response to the sanctions imposed after the invasion of Ukraine, allowing for windfall oil and gas revenues above benchmark to be used to finance a larger deficit in 2022. Savings

Box A1 (continued)

accumulated in the National Welfare Fund can also now be used this way. A new fiscal rule will become fully effective in 2025. The new rule allows for higher oil and gas revenues to be spent, but it simultaneously targets a smaller primary structural deficit.

Saudi Arabia: The IMF staff's baseline fiscal projections are based primarily on its understanding of government policies as outlined in the 2022 budget. Export oil revenues are based on WEO baseline oil price assumptions and the IMF staff's understanding of current oil policy under the OPEC+ (Organization of the Petroleum Exporting Countries, including Russia and other non-OPEC oil exporters) agreement.

Singapore: FY2020 figures are based on budget execution. FY2021 projections are based on revised figures based on budget execution through the end of 2021. FY2022 projections are based on the initial budget of February 18, 2022. The IMF staff assumes gradual withdrawal of remaining pandemic-related measures and the implementation of various revenue measures announced in the FY2022 budget for the remainder of the projection period. These include (1) an increase in the Goods and Services Tax from 7 percent to 8 percent on January 1, 2023, and to 9 percent on January 1, 2024; (2) an increase in property taxes in 2023 for non-owner-occupied properties (from 10 percent–20 percent to 12 percent–36 percent) and for owner-occupied properties with an annual value in excess of \$30,000 (from 4 percent–16 percent to 6 percent–32 percent); and (3) an increase of the carbon tax from S\$5 a tonne to S\$25 a tonne in 2024 and 2025 and S\$45 a tonne in 2026 and 2027.

South Africa: Fiscal assumptions are informed by the 2023 budget. Nontax revenue excludes transactions in financial assets and liabilities, as they involve primarily revenues associated with realized exchange rate valuation gains from the holding of foreign currency deposits, sale of assets, and conceptually similar items.

Spain: Fiscal projections from 2023 onward assume energy support measures amounting to 1 percent of GDP in 2023. Projections for

2021–26 reflect disbursements under the EU Recovery and Resilience Facility.

Sweden: Fiscal estimates are based on the authorities' budget projections, adjusted to reflect the IMF staff's macroeconomic forecasts.

Switzerland: The projections assume that fiscal policy is adjusted as necessary to keep fiscal balances in line with the requirements of Switzerland's fiscal rules.

Türkiye: The basis for the projections is the IMF-defined fiscal balance, which excludes some revenue and expenditure items that are included in the authorities' headline balance.

United Kingdom: Fiscal projections are based on the March 2023 forecast from the Office for Budget Responsibility (OBR) and the September 2023 release on public sector finances from the Office for National Statistics. The IMF staff's projections take the OBR forecast as a reference and overlay adjustments (for differences in assumptions) to both revenues and expenditures. The IMF staff's forecasts do not necessarily assume that the fiscal rules announced on November 17, 2022, will be met at the end of the forecast period. Data are presented on a calendar year basis.

United States: Fiscal projections are based on the May 2023 Congressional Budget Office baseline and the latest Treasury monthly statement, adjusted for the IMF staff's policy and macroeconomic assumptions. Projections incorporate the effects of the Fiscal Responsibility Act.

Monetary Policy Assumptions

Monetary policy assumptions are based on the established policy framework in each country. In most cases, this implies a nonaccommodative stance over the business cycle: official interest rates will increase when economic indicators suggest that inflation will rise above its acceptable rate or range; they will decrease when indicators suggest inflation will not exceed the acceptable rate or range, that output growth is below its potential rate, and that the margin of slack in the economy is significant. With regard to interest rates, please refer to the Assumptions section at the beginning of the Statistical Appendix.

Box A1 (continued)

Argentina: Monetary projections are consistent with the overall macroeconomic framework, the fiscal and financing plans, and the monetary and foreign exchange policies under the crawling-peg regime.

Australia: Monetary policy assumptions are based on the IMF staff's analysis and the expected inflation path.

Brazil: Monetary policy assumptions are consistent with the convergence of inflation within the relevant monetary policy horizon.

Canada: Projections reflect the gradual unwinding monetary policy tightening by the Bank of Canada, as inflation slowly goes back to its mid-range target of 2 percent by early 2025.

Chile: Monetary policy assumptions are consistent with attaining the inflation target.

China: The overall monetary policy stance was moderately accommodative in 2022 and is expected to remain broadly accommodative in 2023.

Denmark: Monetary policy is to maintain the peg to the euro.

Euro area: Monetary policy assumptions for euro area member countries are drawn from a suite of models (semi-structural, DSGE [dynamic stochastic general equilibrium], Taylor rule), market expectations, and the European Central Bank Governing Council communication.

Hong Kong Special Administrative Region: The IMF staff assumes that the currency board system will remain intact.

Hungary: The IMF staff's estimates and projections are informed by expert judgment based on recent developments.

India: Monetary policy projections are consistent with achieving the Reserve Bank of India's inflation target over the medium term.

Indonesia: Monetary policy assumptions are in line with inflation within the central bank's target band over the medium term.

Israel: Monetary policy assumptions are based on gradual normalization of monetary policy.

Japan: Monetary policy assumptions are in line with market expectations.

Korea: Projections assume that the policy rate will evolve in line with market expectations.

Mexico: Monetary policy assumptions are consistent with attaining the inflation target.

New Zealand: Monetary projections are based on the IMF staff's analysis and expected inflation path.

Russia: Monetary policy projections assume that the Central Bank of the Russian Federation is adopting a tight monetary policy stance.

Saudi Arabia: Monetary policy projections are based on the continuation of the exchange rate peg to the US dollar.

Singapore: Broad money is projected to grow in line with the projected growth in nominal GDP.

South Africa: Monetary policy assumptions are consistent with maintaining inflation within the 3–6 percent target band over the medium term.

Sweden: Monetary projections are in line with Riksbank projections.

Türkiye: The baseline assumes that the monetary policy stance will remain in line with market expectations.

United Kingdom: The short-term interest rate path is based on market interest rate expectations.

United States: The IMF staff expects the Federal Open Market Committee to continue to adjust the federal funds target rate in line with the broader macroeconomic outlook.

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¹When countries are not listed alphabetically, they are ordered on the basis of economic size.

Table A1. Summary of World Output¹
(Annual percent change)

	Average										Projections		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028	
World	3.9	3.4	3.2	3.8	3.6	2.8	-2.8	6.3	3.5	3.0	2.9	3.1	
Advanced Economies	1.5	2.3	1.8	2.5	2.3	1.7	-4.2	5.6	2.6	1.5	1.4	1.7	
United States	1.6	2.7	1.7	2.2	2.9	2.3	-2.8	5.9	2.1	2.1	1.5	2.1	
Euro Area	0.8	2.0	1.9	2.6	1.8	1.6	-6.1	5.6	3.3	0.7	1.2	1.3	
Japan	0.5	1.6	0.8	1.7	0.6	-0.4	-4.2	2.2	1.0	2.0	1.0	0.4	
Other Advanced Economies ²	2.6	2.1	2.3	3.0	2.5	1.9	-4.1	6.0	3.1	1.5	1.8	2.0	
Emerging Market and Developing Economies	6.0	4.3	4.4	4.8	4.6	3.6	-1.8	6.9	4.1	4.0	4.0	3.9	
Regional Groups													
Emerging and Developing Asia	8.3	6.8	6.8	6.6	6.4	5.2	-0.5	7.5	4.5	5.2	4.8	4.5	
Emerging and Developing Europe	3.7	1.0	1.8	4.2	3.6	2.5	-1.6	7.3	0.8	2.4	2.2	2.4	
Latin America and the Caribbean	3.4	0.3	-0.8	1.3	1.1	0.2	-7.0	7.3	4.1	2.3	2.3	2.5	
Middle East and Central Asia	4.5	3.0	4.3	2.5	2.8	1.6	-2.6	4.3	5.6	2.0	3.4	3.7	
Sub-Saharan Africa	5.5	3.2	1.5	3.0	3.3	3.2	-1.6	4.7	4.0	3.3	4.0	4.3	
Analytical Groups													
By Source of Export Earnings													
Fuel	4.7	1.7	2.0	0.5	0.8	-0.2	-4.0	4.0	5.4	2.4	3.5	3.0	
Nonfuel	6.3	4.7	4.7	5.3	5.1	4.1	-1.5	7.2	3.9	4.1	4.0	4.0	
Of which, Primary Products	4.3	2.5	1.4	2.9	1.2	0.8	-6.1	7.0	3.4	0.1	2.9	3.0	
By External Financing Source													
Net Debtor Economies	5.1	4.0	3.9	4.7	4.6	3.3	-3.4	6.5	5.0	4.0	4.2	4.7	
Net Debtor Economies by Debt-Servicing Experience													
Economies with Arrears and/or Rescheduling during 2018–22	4.5	1.4	2.8	3.9	3.6	3.3	-0.9	3.4	0.8	2.4	3.6	5.0	
Other Groups													
European Union	1.1	2.5	2.0	3.1	2.3	2.0	-5.6	5.9	3.6	0.7	1.5	1.7	
Middle East and North Africa	4.2	2.9	4.7	1.9	2.1	0.9	-3.0	4.0	5.6	2.0	3.4	3.5	
Emerging Market and Middle-Income Economies	6.0	4.3	4.4	4.7	4.6	3.5	-2.1	7.2	4.0	4.0	3.9	3.7	
Low-Income Developing Countries	6.0	4.8	3.9	4.9	5.1	5.0	1.1	3.9	5.2	4.0	5.1	5.6	
<i>Memorandum</i>													
Median Growth Rate													
Advanced Economies	1.7	2.3	2.2	3.0	2.8	2.0	-4.2	6.3	2.8	1.3	1.6	2.1	
Emerging Market and Developing Economies	4.5	3.3	3.3	3.7	3.6	3.2	-3.5	4.7	4.2	3.2	3.6	3.3	
Emerging Market and Middle-Income Economies	3.9	3.0	2.9	2.8	2.9	2.4	-5.5	4.7	4.3	2.8	3.2	3.0	
Low-Income Developing Countries	5.3	4.3	4.4	4.4	4.4	4.5	-0.9	4.6	4.0	4.0	4.7	4.8	
Output per Capita³													
Advanced Economies	0.9	1.7	1.3	2.1	1.9	1.3	-4.7	5.5	2.2	1.1	1.1	1.5	
Emerging Market and Developing Economies	4.3	2.8	2.8	3.3	3.3	2.3	-3.1	5.7	3.5	2.9	2.9	2.8	
Emerging Market and Middle-Income Economies	4.6	3.0	3.1	3.6	3.6	2.5	-3.0	6.4	3.4	3.3	3.1	3.0	
Low-Income Developing Countries	3.5	2.2	1.5	2.5	2.7	2.6	-1.2	1.1	4.1	1.6	2.9	3.3	
World Growth Rate Based on Market Exchange Rates	2.6	2.8	2.6	3.3	3.2	2.5	-3.2	6.1	3.0	2.5	2.4	2.6	
Value of World Output (billions of US dollars)													
At Market Exchange Rates	65,585	75,011	76,265	81,089	86,096	87,326	84,961	96,488	100,135	104,476	109,734	133,783	
At Purchasing Power Parities	89,497	112,007	116,311	122,474	129,882	135,825	133,452	148,175	163,837	174,790	183,947	224,380	

¹Real GDP.

²Excludes euro area countries, Japan, and the United States.

³Output per capita is in international dollars at purchasing power parity.

Table A2. Advanced Economies: Real GDP and Total Domestic Demand¹
(Annual percent change)

	Average										Projections			Q4 over Q4 ²		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028	2022:Q4	2023:Q4	2024:Q4	
Real GDP																
Advanced Economies	1.5	2.3	1.8	2.5	2.3	1.7	-4.2	5.6	2.6	1.5	1.4	1.7	1.2	1.5	1.5	
United States	1.6	2.7	1.7	2.2	2.9	2.3	-2.8	5.9	2.1	2.1	1.5	2.1	0.9	1.9	1.4	
Euro Area	0.8	2.0	1.9	2.6	1.8	1.6	-6.1	5.6	3.3	0.7	1.2	1.3	1.7	0.7	1.4	
Germany	1.4	1.5	2.2	2.7	1.0	1.1	-3.8	3.2	1.8	-0.5	0.9	0.9	0.8	-0.2	1.7	
France	1.0	1.0	1.0	2.5	1.8	1.9	-7.7	6.4	2.5	1.0	1.3	1.4	0.7	1.0	1.5	
Italy ³	-0.5	0.8	1.3	1.7	0.9	0.5	-9.0	7.0	3.7	0.7	0.7	0.9	1.5	0.3	1.2	
Spain	0.5	3.8	3.0	3.0	2.3	2.0	-11.2	6.4	5.8	2.5	1.7	1.6	3.8	1.6	2.0	
The Netherlands	1.1	2.0	2.2	2.9	2.4	2.0	-3.9	6.2	4.3	0.6	1.1	1.6	3.1	-0.1	1.4	
Belgium	1.4	2.0	1.3	1.6	1.8	2.3	-5.4	6.3	3.2	1.0	0.9	1.3	1.5	1.0	0.8	
Ireland	1.8	24.5	1.8	9.3	8.5	5.3	6.6	15.1	9.4	2.0	3.3	2.7	10.8	6.4	-3.0	
Austria	1.3	1.0	2.0	2.3	2.4	1.5	-6.5	4.6	4.8	0.1	0.8	1.3	2.7	-0.2	1.5	
Portugal	-0.2	1.8	2.0	3.5	2.8	2.7	-8.3	5.5	6.7	2.3	1.5	1.9	3.2	2.1	2.2	
Greece	-2.1	-0.2	-0.5	1.1	1.7	1.9	-9.0	8.4	5.9	2.5	2.0	1.1	4.8	2.4	1.5	
Finland	0.7	0.5	2.8	3.2	1.1	1.2	-2.4	3.2	1.6	-0.1	1.0	1.6	-0.5	0.0	2.7	
Slovak Republic	3.9	5.2	1.9	2.9	4.0	2.5	-3.3	4.9	1.7	1.3	2.5	2.7	1.0	1.6	2.9	
Croatia	0.4	2.5	3.6	3.4	2.8	3.4	-8.5	13.1	6.2	2.7	2.6	2.8	3.8	2.5	3.6	
Lithuania	3.0	2.0	2.5	4.3	4.0	4.6	0.0	6.0	1.9	-0.2	2.7	2.1	-0.5	0.9	2.5	
Slovenia	1.3	2.2	3.2	4.8	4.5	3.5	-4.2	8.2	2.5	2.0	2.2	2.8	-1.5	0.2	2.4	
Luxembourg	2.5	2.3	5.0	1.3	1.2	2.9	-0.9	7.2	1.4	-0.4	1.5	2.3	-2.3	2.4	0.4	
Latvia	2.1	3.9	2.4	3.3	4.0	2.6	-2.3	4.3	2.8	0.5	2.6	3.2	1.2	0.7	3.4	
Estonia	2.2	1.9	3.2	5.8	3.8	4.0	-1.0	7.2	-0.5	-2.3	2.4	2.9	-3.2	-0.2	3.0	
Cyprus	0.6	3.4	6.6	5.7	5.6	5.5	-4.4	6.6	5.6	2.2	2.7	2.9	4.0	1.8	2.9	
Malta	3.6	9.6	3.4	10.9	7.4	7.1	-8.1	12.3	6.9	3.8	3.3	3.5	5.3	3.0	3.3	
Japan	0.5	1.6	0.8	1.7	0.6	-0.4	-4.2	2.2	1.0	2.0	1.0	0.4	0.5	2.1	1.0	
United Kingdom ³	1.2	2.4	2.2	2.4	1.7	1.6	-11.0	7.6	4.1	0.5	0.6	1.5	0.6	0.6	0.8	
Korea	3.8	2.8	2.9	3.2	2.9	2.2	-0.7	4.3	2.6	1.4	2.2	2.1	1.3	2.6	1.8	
Canada	1.9	0.7	1.0	3.0	2.8	1.9	-5.1	5.0	3.4	1.3	1.6	1.7	2.1	1.2	2.1	
Taiwan Province of China	4.0	1.5	2.2	3.3	2.8	3.1	3.4	6.5	2.4	0.8	3.0	2.1	-1.0	1.9	4.0	
Australia	2.8	2.3	2.7	2.4	2.8	1.9	-1.8	5.2	3.7	1.8	1.2	2.3	2.7	0.9	2.3	
Switzerland	2.2	1.6	2.1	1.4	2.9	1.2	-2.3	5.4	2.7	0.9	1.8	1.8	1.2	1.2	1.6	
Singapore	6.1	3.0	3.6	4.5	3.6	1.3	-3.9	8.9	3.6	1.0	2.1	2.5	2.1	2.1	1.3	
Sweden	1.8	4.5	2.1	2.6	2.0	2.0	-2.2	6.1	2.8	-0.7	0.6	2.1	-0.2	-1.0	2.1	
Hong Kong SAR	3.9	2.4	2.2	3.8	2.8	-1.7	-6.5	6.4	-3.5	4.4	2.9	2.4	-4.1	7.4	2.2	
Czech Republic	2.2	5.4	2.5	5.2	3.2	3.0	-5.5	3.6	2.3	0.2	2.3	2.5	0.1	1.4	2.6	
Israel	4.2	2.3	4.4	4.3	4.1	3.8	-1.5	9.3	6.5	3.1	3.0	3.8	2.6	2.8	3.1	
Norway	1.4	1.9	1.2	2.5	0.8	1.1	-1.3	3.9	3.3	2.3	1.5	1.4	1.7	3.3	0.2	
Denmark	0.7	2.3	3.2	2.8	2.0	1.5	-2.4	6.8	2.7	1.7	1.4	1.3	0.4	1.5	1.6	
New Zealand	2.0	3.7	3.9	3.5	3.5	3.1	-1.5	6.1	2.7	1.1	1.0	2.4	2.3	0.6	2.2	
Puerto Rico	-1.1	-1.0	-1.3	-2.9	-4.4	1.7	-4.4	0.2	2.0	-0.7	-0.2	0.8	...	...	...
Macao SAR	10.2	-21.5	-0.7	10.0	6.5	-2.5	-54.2	19.3	-26.8	74.4	27.2	3.4	...	...	...
Iceland	2.1	4.4	6.3	4.2	4.9	1.9	-7.2	4.5	7.2	3.3	1.7	2.4	5.1	-0.6	5.4	
Andorra	-0.8	1.4	3.7	0.3	1.6	2.0	-11.2	8.3	8.8	2.1	1.5	1.5	...	...	...
San Marino	-2.2	2.7	2.3	0.3	1.5	2.0	-6.8	14.2	5.0	2.2	1.3	1.3	...	...	...
<i>Memorandum</i>																
Major Advanced Economies	1.2	2.1	1.5	2.2	2.1	1.6	-4.5	5.4	2.3	1.5	1.2	1.6	0.9	1.4	1.3	
Real Total Domestic Demand																
Advanced Economies	1.3	2.6	2.0	2.5	2.3	2.0	-4.1	5.6	3.0	1.0	1.4	1.8	1.0	1.6	1.4	
United States	1.4	3.4	1.8	2.3	3.1	2.3	-2.4	7.0	2.4	1.4	1.4	2.1	0.5	1.8	1.3	
Euro Area	0.5	2.3	2.4	2.3	1.9	2.4	-5.7	4.4	3.6	0.3	1.2	1.4	1.2	0.7	1.2	
Germany	1.1	1.4	3.1	2.6	1.6	1.5	-3.1	2.5	3.2	-0.9	0.9	1.0	1.7	-0.7	1.8	
France	1.2	1.4	1.4	2.6	1.4	2.2	-6.4	6.0	3.1	0.5	1.2	1.3	1.3	0.9	0.8	
Italy ³	-0.8	1.2	1.8	1.8	1.3	-0.2	-8.4	7.2	4.3	0.3	0.9	1.0	0.3	1.3	0.7	
Spain	-0.2	4.1	2.1	3.3	3.0	1.7	-9.2	6.7	3.0	2.0	1.8	1.7	0.8	2.9	0.9	
Japan	0.5	1.1	0.3	1.1	0.6	0.0	-3.4	1.2	1.6	1.0	1.0	0.5	1.1	0.9	1.3	
United Kingdom ³	1.2	2.9	3.2	2.1	1.2	1.8	-12.3	8.8	4.4	0.8	0.5	1.5	-0.2	4.3	-0.8	
Canada	2.7	-0.2	0.4	4.1	2.5	1.1	-6.0	6.6	4.7	-0.7	1.9	2.0	1.7	0.4	2.7	
Other Advanced Economies ⁴	2.8	2.6	2.9	3.6	2.7	1.6	-2.4	5.5	3.3	1.3	2.0	2.3	2.2	1.4	3.0	
<i>Memorandum</i>																
Major Advanced Economies	1.1	2.4	1.7	2.2	2.2	1.7	-4.2	5.8	2.8	0.8	1.2	1.6	0.8	1.4	1.2	

¹In this and other tables, when countries are not listed alphabetically, they are ordered on the basis of economic size.

²From the fourth quarter of the preceding year.

³See the country-specific notes for Italy and the United Kingdom in the "Country Notes" section of the Statistical Appendix.

⁴Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

Table A3. Advanced Economies: Components of Real GDP
(Annual percent change)

	Averages										Projections	
	2005–14	2015–24	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Private Consumer Expenditure												
Advanced Economies	1.4	1.7	2.4	2.1	2.2	2.2	1.5	-5.5	5.6	3.6	1.7	1.5
United States	1.7	2.4	3.3	2.5	2.4	2.9	2.0	-3.0	8.3	2.7	2.4	1.2
Euro Area	0.5	1.1	1.9	2.0	1.8	1.5	1.4	-7.7	4.1	4.3	0.7	1.6
Germany	0.8	1.0	1.9	2.4	1.4	1.5	1.6	-5.9	1.5	3.9	-0.5	2.1
France	1.2	0.9	1.4	1.6	1.6	1.0	1.8	-6.7	5.2	2.2	0.0	1.5
Italy ¹	-0.4	0.6	1.9	1.2	1.5	1.0	0.2	-10.4	4.7	4.6	1.4	1.1
Spain	0.0	1.3	2.9	2.7	3.0	1.7	1.1	-12.3	7.1	4.7	2.0	1.4
Japan	0.7	0.0	-0.2	-0.4	1.1	0.2	-0.6	-4.7	0.4	2.1	1.0	1.3
United Kingdom ¹	1.2	1.0	3.1	3.6	1.9	2.5	1.1	-13.2	6.2	5.6	0.2	0.0
Canada	2.9	2.2	2.3	2.1	3.7	2.6	1.5	-6.1	5.0	4.8	3.1	3.4
Other Advanced Economies ²	2.7	2.0	2.9	2.6	2.8	2.8	1.9	-5.4	4.3	4.1	2.4	2.3
<i>Memorandum</i>												
Major Advanced Economies	1.3	1.6	2.4	2.0	2.0	2.1	1.4	-5.1	5.8	3.2	1.6	1.3
Public Consumption												
Advanced Economies	1.2	1.8	1.7	2.1	0.8	1.5	2.8	1.9	3.6	1.0	1.3	1.0
United States	0.3	1.5	1.6	1.9	-0.1	1.2	3.4	2.2	1.3	-0.2	2.7	1.4
Euro Area	1.2	1.4	1.3	1.9	1.1	1.0	1.8	1.1	4.1	1.3	0.1	0.6
Germany	1.7	2.0	2.9	4.0	1.7	0.8	2.6	4.1	3.1	1.6	-1.6	1.0
France	1.5	1.2	1.0	1.4	1.4	0.8	1.0	-4.2	6.5	2.6	0.9	0.7
Italy ¹	-0.3	-0.3	-0.6	0.7	-0.1	0.1	-0.6	0.0	1.5	0.0	-2.5	-1.6
Spain	2.1	1.9	2.0	1.0	1.0	2.3	1.9	3.6	3.4	-0.2	3.0	1.3
Japan	1.3	1.4	1.9	1.6	0.1	1.0	1.9	2.4	3.5	1.2	0.0	0.0
United Kingdom ¹	1.3	1.7	1.2	0.8	0.4	0.3	4.1	-7.3	12.5	1.8	2.6	1.6
Canada	1.7	2.0	1.4	1.8	2.1	3.2	1.0	1.3	6.4	2.0	0.4	0.4
Other Advanced Economies ²	2.9	3.0	2.8	3.5	2.4	3.5	3.7	4.6	4.5	2.6	0.9	1.1
<i>Memorandum</i>												
Major Advanced Economies	0.8	1.5	1.6	1.9	0.4	1.1	2.6	1.1	3.2	0.6	1.4	0.9
Gross Fixed Capital Formation												
Advanced Economies	0.9	2.3	3.6	2.6	3.9	3.1	3.0	-3.2	5.5	1.4	1.0	2.0
United States	1.2	2.4	3.7	2.1	3.8	4.7	2.6	-1.2	5.7	-0.5	0.5	2.8
Euro Area	-0.3	2.5	4.7	4.0	3.9	3.1	6.9	-6.3	3.4	2.8	1.4	1.5
Germany	1.7	1.2	1.7	3.8	2.6	3.3	1.7	-2.4	-0.2	0.1	0.9	0.3
France	0.7	2.3	0.8	2.5	5.0	3.2	4.1	-7.0	10.2	2.4	1.6	0.5
Italy ¹	-2.8	3.5	1.8	4.0	3.2	3.1	1.2	-7.9	18.6	9.4	1.1	2.8
Spain	-2.6	2.6	4.9	2.4	6.8	6.3	4.5	-9.0	2.8	2.4	2.4	3.8
Japan	-0.3	0.6	2.3	1.2	1.6	0.6	0.5	-3.5	0.2	-0.9	2.3	1.3
United Kingdom ¹	0.8	1.9	6.5	4.9	3.5	-0.2	1.9	-10.5	6.1	8.6	1.3	-1.9
Canada	3.2	0.1	-5.2	-4.7	3.3	2.5	0.8	-2.4	7.4	-1.5	-1.8	3.1
Other Advanced Economies ²	2.9	2.5	2.3	3.0	4.9	2.1	0.8	-1.0	7.9	2.2	1.0	2.4
<i>Memorandum</i>												
Major Advanced Economies	0.8	2.0	2.8	2.2	3.4	3.3	2.2	-3.2	5.6	1.0	0.9	1.8

Table A3. Advanced Economies: Components of Real GDP (continued)
(Annual percent change)

	Averages										Projections	
	2005–14	2015–24	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Final Domestic Demand												
Advanced Economies	1.3	1.8	2.6	2.2	2.3	2.2	2.1	-3.7	5.2	2.6	1.5	1.5
United States	1.4	2.3	3.1	2.3	2.3	3.0	2.3	-1.9	6.7	1.7	2.1	1.6
Euro Area	0.5	1.5	2.3	2.4	2.1	1.8	2.6	-5.5	4.0	3.3	0.7	1.4
Germany	1.2	1.2	2.1	3.1	1.7	1.8	1.8	-2.9	1.5	2.5	-0.5	1.5
France	1.1	1.3	1.2	1.7	2.3	1.4	2.1	-6.2	6.6	2.3	0.6	1.1
Italy ¹	-0.8	1.0	1.4	1.6	1.5	1.2	0.2	-8.0	6.6	4.7	0.6	1.0
Spain	-0.1	1.7	3.1	2.3	3.3	2.7	1.9	-8.5	5.4	3.2	2.3	1.9
Japan	0.5	0.4	0.8	0.3	1.0	0.5	0.2	-3.0	1.1	1.1	1.3	1.2
United Kingdom ¹	1.1	1.3	3.3	3.3	1.9	1.6	1.8	-11.6	7.5	5.3	0.9	0.0
Canada	2.7	1.5	0.3	0.5	3.3	2.7	1.3	-3.8	5.8	2.7	0.8	2.1
Other Advanced Economies ²	2.8	2.3	2.7	2.9	3.4	2.4	1.9	-2.4	5.3	3.1	1.7	2.1
<i>Memorandum</i>												
Major Advanced Economies	1.1	1.7	2.3	2.0	2.0	2.2	1.8	-3.6	5.5	2.3	1.4	1.3
Stock Building³												
Advanced Economies	0.0	0.0	0.0	-0.2	0.2	0.1	-0.1	-0.4	0.3	0.6	-0.5	-0.1
United States	0.0	0.0	0.3	-0.5	0.0	0.2	0.0	-0.5	0.2	0.7	-0.7	-0.1
Euro Area	0.0	0.0	0.0	0.0	0.2	0.1	-0.3	-0.2	0.4	0.4	-0.4	-0.1
Germany	-0.1	0.0	-0.7	0.0	0.9	-0.1	-0.3	-0.1	0.9	0.7	-0.4	-0.5
France	0.1	0.0	0.3	-0.4	0.3	-0.1	0.1	-0.2	-0.6	0.8	-0.1	0.1
Italy ¹	0.0	-0.1	-0.1	0.2	0.2	0.1	-0.5	-0.5	0.5	-0.4	-0.1	-0.2
Spain	-0.1	-0.5	-1.5	-0.1	0.0	0.3	-0.2	-0.8	-1.8	-0.2	-0.3	-0.1
Japan	-0.1	0.0	0.3	-0.1	0.1	0.2	-0.1	-0.5	0.2	0.4	-0.1	0.0
United Kingdom ¹	0.1	-0.1	-0.1	-0.2	0.2	-0.5	0.1	-0.6	1.0	0.3	-0.8	0.0
Canada	0.0	0.2	-0.5	0.0	0.9	-0.1	-0.1	-1.2	1.1	3.0	-1.1	-0.2
Other Advanced Economies ²	0.0	0.0	-0.1	0.0	0.2	0.3	-0.2	-0.1	0.3	0.2	-0.5	-0.1
<i>Memorandum</i>												
Major Advanced Economies	0.0	0.0	0.1	-0.3	0.2	0.0	-0.1	-0.5	0.3	0.7	-0.5	-0.1
Foreign Balance³												
Advanced Economies	0.2	-0.1	-0.3	-0.1	0.1	-0.1	-0.2	-0.2	0.0	-0.4	0.6	0.1
United States	0.2	-0.3	-0.8	-0.2	-0.2	-0.3	-0.1	-0.3	-1.2	-0.4	0.6	0.0
Euro Area	0.3	0.0	-0.2	-0.4	0.4	0.0	-0.7	-0.6	1.4	-0.2	0.3	0.1
Germany	0.4	-0.2	0.3	-0.6	0.2	-0.6	-0.3	-1.0	0.8	-1.3	0.4	0.2
France	-0.2	-0.2	-0.4	-0.4	-0.2	0.4	-0.3	-1.2	0.1	-0.7	0.4	0.1
Italy ¹	0.3	-0.2	-0.4	-0.5	0.0	-0.3	0.7	-0.8	0.0	-0.5	0.2	-0.1
Spain	0.7	0.1	-0.1	1.0	-0.2	-0.6	0.4	-2.2	-0.2	2.9	0.5	0.0
Japan	0.0	0.1	0.5	0.5	0.6	0.0	-0.5	-0.9	1.1	-0.5	0.7	0.0
United Kingdom ¹	-0.1	-0.1	-0.4	-0.3	1.0	-0.1	-0.3	1.5	-1.2	-1.2	-0.4	0.2
Canada	-0.8	-0.1	0.8	0.4	-1.1	0.2	0.7	0.3	-2.1	-1.5	1.9	-0.3
Other Advanced Economies ²	0.6	0.2	0.0	0.0	-0.2	0.2	0.5	0.6	0.5	-0.3	0.7	0.3
<i>Memorandum</i>												
Major Advanced Economies	0.1	-0.2	-0.3	-0.2	0.0	-0.2	-0.1	-0.4	-0.6	-0.6	0.5	0.0

¹See the country-specific notes for Italy and the United Kingdom in the "Country Notes" section of the Statistical Appendix.

²Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

³Changes expressed as percent of GDP in the preceding period.

Table A4. Emerging Market and Developing Economies: Real GDP
(Annual percent change)

	Average									Projections		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028
Emerging and Developing Asia	8.3	6.8	6.8	6.6	6.4	5.2	-0.5	7.5	4.5	5.2	4.8	4.5
Bangladesh	6.2	6.6	7.1	6.6	7.3	7.9	3.4	6.9	7.1	6.0	6.0	7.0
Bhutan	7.6	6.2	7.4	6.3	3.8	4.4	-2.3	-3.3	4.8	5.3	3.0	3.6
Brunei Darussalam	0.4	-0.4	-2.5	1.3	0.1	3.9	1.1	-1.6	-1.6	-0.8	3.5	3.2
Cambodia	7.5	7.0	6.9	7.0	7.5	7.1	-3.1	3.0	5.2	5.6	6.1	6.3
China	10.0	7.0	6.9	6.9	6.8	6.0	2.2	8.4	3.0	5.0	4.2	3.4
Fiji	1.6	4.5	2.4	5.4	3.8	-0.6	-17.0	-4.9	20.0	7.5	3.9	3.3
India ¹	7.7	8.0	8.3	6.8	6.5	3.9	-5.8	9.1	7.2	6.3	6.3	6.3
Indonesia	5.9	4.9	5.0	5.1	5.2	5.0	-2.1	3.7	5.3	5.0	5.0	5.0
Kiribati	1.4	9.9	-0.5	-0.1	5.3	-2.1	-1.4	7.9	1.2	2.6	2.4	2.1
Lao P.D.R.	7.8	7.3	7.0	6.9	6.3	4.7	-0.4	2.1	2.3	4.0	4.0	4.5
Malaysia	4.9	5.0	4.4	5.8	4.8	4.4	-5.5	3.3	8.7	4.0	4.3	3.9
Maldives	5.1	2.9	6.3	7.2	8.1	6.9	-33.4	41.7	13.9	8.1	5.0	5.1
Marshall Islands	0.7	2.1	2.1	3.7	5.7	10.3	-2.9	1.0	-4.5	3.0	3.0	1.5
Micronesia	-0.4	4.6	0.9	2.7	0.2	1.2	-2.8	-2.2	-0.6	2.6	3.1	0.6
Mongolia	8.5	2.4	1.5	5.6	7.7	5.6	-4.6	1.6	5.0	5.5	4.5	4.0
Myanmar	8.4	7.5	6.4	5.8	6.4	6.8	3.2	-17.9	2.0	2.6	2.6	3.4
Nauru	7.5	-5.7	8.0	-5.9	7.2	9.1	4.1	2.9	1.9	0.5	1.3	2.3
Nepal	4.3	4.0	0.4	9.0	7.6	6.7	-2.4	4.8	5.6	0.8	5.0	5.1
Palau	0.0	9.5	1.5	-3.5	1.3	1.4	-7.0	-13.4	-2.0	0.8	12.4	1.5
Papua New Guinea	5.4	6.6	5.5	3.5	-0.3	4.5	-3.2	0.1	4.3	3.0	5.0	3.1
Philippines	5.4	6.3	7.1	6.9	6.3	6.1	-9.5	5.7	7.6	5.3	5.9	6.4
Samoa	1.5	3.9	8.0	1.4	-0.6	4.5	-3.1	-7.1	-5.3	8.0	3.6	2.3
Solomon Islands	4.7	1.7	5.6	3.1	2.7	1.7	-3.4	-0.6	-4.1	2.5	2.4	3.0
Sri Lanka ¹	6.6	4.2	5.1	6.5	2.3	-0.2	-4.6	3.5	-7.8	...	...	...
Thailand	3.5	3.1	3.4	4.2	4.2	2.1	-6.1	1.5	2.6	2.7	3.2	3.0
Timor-Leste ²	5.7	2.8	3.4	-3.1	-0.7	2.1	-8.3	2.9	3.9	1.5	3.1	3.0
Tonga	0.5	1.2	6.6	3.3	0.2	0.7	0.5	-2.7	-2.0	2.6	2.5	1.2
Tuvalu	1.2	9.4	4.7	3.3	1.4	13.8	-4.3	1.8	0.7	3.9	3.5	2.0
Vanuatu	3.4	0.4	4.7	6.3	2.9	3.2	-5.0	0.6	1.9	1.5	2.6	2.5
Vietnam	6.3	7.0	6.7	6.9	7.5	7.4	2.9	2.6	8.0	4.7	5.8	6.8
Emerging and Developing Europe	3.7	1.0	1.8	4.2	3.6	2.5	-1.6	7.3	0.8	2.4	2.2	2.4
Albania	3.8	2.2	3.3	3.8	4.0	2.1	-3.3	8.9	4.8	3.6	3.3	3.5
Belarus	5.5	-3.8	-2.5	2.5	3.1	1.4	-0.7	2.3	-3.7	1.6	1.3	0.6
Bosnia and Herzegovina	2.5	4.3	3.2	3.2	3.8	2.9	-3.0	7.4	4.1	2.0	3.0	3.0
Bulgaria	2.8	3.4	3.0	2.8	2.7	4.0	-4.0	7.6	3.4	1.7	3.2	2.8
Hungary	1.0	3.7	2.2	4.3	5.4	4.9	-4.5	7.2	4.6	-0.3	3.1	3.5
Kosovo	4.5	5.9	5.6	4.8	3.4	4.8	-5.3	10.7	3.5	3.8	4.0	3.8
Moldova	4.3	-0.3	4.4	4.2	4.1	3.6	-8.3	13.9	-5.0	2.0	4.3	5.0
Montenegro	2.9	3.4	2.9	4.7	5.1	4.1	-15.3	13.0	6.1	4.5	3.7	3.0
North Macedonia	3.3	3.9	2.8	1.1	2.9	3.9	-4.7	3.9	2.1	2.5	3.2	3.5
Poland	3.8	4.4	3.0	5.1	5.9	4.4	-2.0	6.9	5.1	0.6	2.3	3.1
Romania	3.0	3.2	2.9	8.2	6.0	3.8	-3.7	5.9	4.7	2.2	3.8	3.7
Russia	3.4	-2.0	0.2	1.8	2.8	2.2	-2.7	5.6	-2.1	2.2	1.1	0.9
Serbia	2.3	1.8	3.3	2.1	4.5	4.3	-0.9	7.5	2.3	2.0	3.0	4.0
Türkiye ¹	5.4	6.1	3.3	7.5	3.0	0.8	1.9	11.4	5.5	4.0	3.0	3.2
Ukraine ¹	0.7	-9.8	2.4	2.4	3.5	3.2	-3.8	3.4	-29.1	2.0	3.2	4.0
Latin America and the Caribbean	3.4	0.3	-0.8	1.3	1.1	0.2	-7.0	7.3	4.1	2.3	2.3	2.5
Antigua and Barbuda	1.1	3.8	5.5	3.1	6.8	4.3	-17.5	6.6	8.5	5.6	5.4	2.8
Argentina	3.8	2.7	-2.1	2.8	-2.6	-2.0	-9.9	10.7	5.0	-2.5	2.8	2.5
Aruba	-0.1	3.6	2.1	0.7	2.4	-2.3	-24.0	27.6	10.5	2.3	1.2	1.1
The Bahamas	0.5	1.0	-0.8	2.5	2.9	-0.7	-23.5	17.0	14.4	4.3	1.8	1.5
Barbados	0.2	2.4	2.5	0.5	-0.6	-0.5	-13.3	-0.2	9.8	4.5	3.9	2.0
Belize	2.1	3.4	0.1	-1.7	1.1	4.5	-13.4	15.2	12.7	4.0	3.0	2.5
Bolivia	5.0	4.9	4.3	4.2	4.2	2.2	-8.7	6.1	3.5	1.8	1.8	2.3
Brazil	3.5	-3.5	-3.3	1.3	1.8	1.2	-3.3	5.0	2.9	3.1	1.5	2.0
Chile	4.3	2.2	1.8	1.4	4.0	0.7	-6.1	11.7	2.4	-0.5	1.6	2.4
Colombia	4.7	3.0	2.1	1.4	2.6	3.2	-7.3	11.0	7.3	1.4	2.0	3.3

Table A4. Emerging Market and Developing Economies: Real GDP (continued)
(Annual percent change)

	Average									Projections		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028
Latin America and the Caribbean (continued)	3.4	0.3	-0.8	1.3	1.1	0.2	-7.0	7.3	4.1	2.3	2.3	2.5
Costa Rica	4.4	3.7	4.2	4.2	2.6	2.4	-4.3	7.8	4.3	4.4	3.2	3.2
Dominica	2.0	-2.7	2.8	-6.6	3.5	5.5	-16.6	6.9	5.7	4.6	4.6	2.7
Dominican Republic	5.6	6.9	6.7	4.7	7.0	5.1	-6.7	12.3	4.9	3.0	5.2	5.0
Ecuador	4.4	0.1	-1.2	2.4	1.3	0.0	-7.8	4.2	2.9	1.4	1.8	2.8
El Salvador	2.2	2.4	2.5	2.3	2.4	2.5	-7.9	11.2	2.6	2.2	1.9	2.0
Grenada	1.7	6.4	3.7	4.4	4.4	0.7	-13.8	4.7	6.4	3.9	3.8	2.7
Guatemala	3.7	4.1	2.7	3.1	3.4	4.0	-1.8	8.0	4.1	3.4	3.5	3.9
Guyana	3.5	0.7	3.8	3.7	4.4	5.4	43.5	20.1	62.3	38.4	26.6	13.5
Haiti	2.4	2.6	1.8	2.5	1.7	-1.7	-3.3	-1.8	-1.7	-1.5	1.4	1.5
Honduras	3.8	3.8	3.9	4.8	3.8	2.7	-9.0	12.5	4.0	2.9	3.2	3.8
Jamaica	0.1	0.9	1.5	0.7	1.8	1.0	-9.9	4.6	5.2	2.0	1.8	1.6
Mexico	1.8	2.7	1.8	1.9	2.0	-0.3	-8.7	5.8	3.9	3.2	2.1	2.1
Nicaragua	4.0	4.8	4.8	4.4	-3.4	-2.9	-1.8	10.3	3.8	3.0	3.3	3.5
Panama	7.7	5.7	5.0	5.6	3.7	3.3	-17.7	15.8	10.8	6.0	4.0	4.0
Paraguay	4.6	3.0	4.3	4.8	3.2	-0.4	-0.8	4.0	0.1	4.5	3.8	3.5
Peru	6.1	3.3	4.0	2.5	4.0	2.2	-11.0	13.3	2.7	1.1	2.7	3.0
St. Kitts and Nevis	3.5	0.7	3.9	0.0	2.1	4.1	-14.6	-0.9	8.8	4.9	3.8	2.7
St. Lucia	1.5	-0.2	3.8	3.4	2.9	-0.2	-23.6	11.3	15.7	3.2	2.3	1.5
St. Vincent and the Grenadines	1.1	2.8	4.1	1.5	3.2	0.7	-3.7	0.8	5.5	6.2	5.0	2.7
Suriname	4.0	-3.4	-4.9	1.6	4.9	1.1	-15.9	-2.7	1.0	2.1	3.0	3.0
Trinidad and Tobago	3.6	1.0	-7.5	-4.8	-0.6	0.4	-9.1	-1.0	1.5	2.5	2.2	1.4
Uruguay ¹	5.4	0.4	1.7	1.7	0.2	0.7	-6.3	5.3	4.9	1.0	3.2	2.2
Venezuela	3.6	-6.2	-17.0	-15.7	-19.7	-27.7	-30.0	1.0	8.0	4.0	4.5	...
Middle East and Central Asia	4.5	3.0	4.3	2.5	2.8	1.6	-2.6	4.3	5.6	2.0	3.4	3.7
Afghanistan ¹	9.1	1.0	2.2	2.6	1.2	3.9	-2.4	-20.7	...	...	...	...
Algeria	3.1	3.7	3.2	1.4	1.2	1.0	-5.1	3.4	3.2	3.8	3.1	1.7
Armenia	5.2	3.3	0.2	7.5	5.2	7.6	-7.2	5.7	12.6	7.0	5.0	4.5
Azerbaijan	11.6	1.1	-3.1	0.2	1.5	2.5	-4.2	5.6	4.6	2.5	2.5	2.5
Bahrain	5.0	2.5	3.6	4.3	2.1	2.2	-4.6	2.6	4.9	2.7	3.6	2.7
Djibouti	4.9	7.3	7.1	5.5	4.8	5.5	1.3	4.5	3.2	5.0	6.0	5.0
Egypt	4.5	4.4	4.3	4.2	5.3	5.5	3.6	3.3	6.7	4.2	3.6	6.0
Georgia	5.7	3.0	2.9	4.8	4.8	5.0	-6.8	10.5	10.1	6.2	4.8	5.2
Iran	2.5	-1.4	8.8	2.8	-1.8	-3.1	3.3	4.7	3.8	3.0	2.5	2.0
Iraq	5.6	2.5	15.2	-3.4	4.7	5.4	-12.1	1.6	7.0	-2.7	2.9	3.2
Jordan	5.1	2.5	2.0	2.5	1.9	1.8	-1.6	2.2	2.5	2.6	2.7	3.0
Kazakhstan	6.3	1.0	0.9	3.9	4.1	4.5	-2.6	4.1	3.3	4.6	4.2	3.0
Kuwait	3.4	0.6	2.9	-4.7	2.4	-0.6	-8.9	1.1	8.9	-0.6	3.6	2.4
Kyrgyz Republic	4.2	3.9	4.3	4.7	3.5	4.6	-7.1	5.5	6.3	3.4	4.3	4.0
Lebanon ¹	4.8	0.5	1.6	0.9	-1.9	-6.9	-25.9	-10.0	0.0	...	...	...
Libya	-3.6	-0.8	-1.5	32.5	7.9	-11.2	-29.5	28.3	-9.6	12.5	7.5	2.3
Mauritania	4.3	5.4	1.3	6.3	4.8	5.4	-0.9	2.4	6.5	4.5	5.3	4.1
Morocco	4.3	4.3	0.5	5.1	3.1	2.9	-7.2	8.0	1.3	2.4	3.6	3.4
Oman	4.8	5.0	5.0	0.3	1.3	-1.1	-3.4	3.1	4.3	1.2	2.7	3.1
Pakistan	4.0	3.8	4.1	4.6	6.1	3.1	-0.9	5.8	6.1	-0.5	2.5	5.0
Qatar	12.7	4.8	3.1	-1.5	1.2	0.7	-3.6	1.5	4.9	2.4	2.2	2.8
Saudi Arabia	4.2	4.7	2.4	-0.1	2.8	0.8	-4.3	3.9	8.7	0.8	4.0	3.1
Somalia	...	4.6	-1.3	9.5	3.0	3.6	-2.6	3.3	2.4	2.8	3.7	4.3
Sudan ^{1,3}	0.7	4.9	4.7	0.8	-2.3	-2.5	-3.6	0.5	-2.5	-18.3	0.3	4.5
Syria ⁴	...	...	...	...	...	...	...	...	...	...	...	...
Tajikistan	6.9	6.0	6.9	7.1	7.6	7.4	4.4	9.4	8.0	6.5	5.0	4.5
Tunisia	3.4	1.0	1.1	2.2	2.6	1.6	-8.8	4.4	2.5	1.3	1.9	2.6
Turkmenistan	9.3	3.0	-1.0	4.7	0.9	-3.4	-2.9	4.6	1.6	2.5	2.1	1.9
United Arab Emirates	3.8	6.8	5.6	0.7	1.3	1.1	-5.0	4.4	7.9	3.4	4.0	4.5
Uzbekistan	7.7	7.2	5.9	4.4	5.9	6.0	2.0	7.4	5.7	5.5	5.5	5.5
West Bank and Gaza	5.5	3.7	8.9	1.4	1.2	1.4	-11.3	7.0	3.9	3.0	2.7	2.0
Yemen	2.0	-28.0	-9.4	-5.1	0.8	2.1	-8.5	-1.0	1.5	-0.5	2.0	5.5

Table A4. Emerging Market and Developing Economies: Real GDP (continued)
(Annual percent change)

	Average									Projections		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028
Sub-Saharan Africa	5.5	3.2	1.5	3.0	3.3	3.2	-1.6	4.7	4.0	3.3	4.0	4.3
Angola	7.8	0.9	-2.6	-0.2	-1.3	-0.7	-5.6	1.2	3.0	1.3	3.3	3.6
Benin	4.2	1.8	3.3	5.7	6.7	6.9	3.8	7.2	6.3	5.5	6.3	6.0
Botswana	3.7	-4.9	7.2	4.1	4.2	3.0	-8.7	11.9	5.8	3.8	4.1	4.0
Burkina Faso	5.9	3.9	6.0	6.2	6.6	5.7	1.9	6.9	1.5	4.4	6.4	5.3
Burundi	4.5	-3.9	-0.6	0.5	1.6	1.8	0.3	3.1	1.8	3.3	6.0	5.5
Cabo Verde	4.3	0.9	4.3	4.6	3.7	6.9	-19.6	6.4	17.0	4.4	4.5	4.7
Cameroon	3.6	5.6	4.5	3.5	4.0	3.4	0.5	3.6	3.8	4.0	4.2	4.6
Central African Republic	-1.5	4.3	4.7	4.5	3.8	3.0	1.0	1.0	0.5	1.0	2.5	3.3
Chad	5.4	1.8	-5.6	-2.4	2.4	3.4	-2.1	-1.2	3.4	4.0	3.7	3.0
Comoros	2.9	1.1	3.3	3.8	3.6	1.8	-0.2	2.1	2.6	3.0	3.5	4.3
Democratic Republic of the Congo	7.2	6.4	0.4	3.7	4.8	4.5	1.7	6.2	8.9	6.7	4.7	5.2
Republic of Congo	5.5	-3.6	-5.0	-5.6	-2.3	1.1	-6.3	1.1	1.7	4.0	4.4	4.0
Côte d'Ivoire	3.6	8.8	7.2	7.4	4.8	6.5	1.7	7.0	6.7	6.2	6.6	6.0
Equatorial Guinea	4.8	-9.1	-8.8	-5.7	-6.2	-5.5	-4.8	-0.4	3.2	-6.2	-5.5	-0.6
Eritrea ¹	4.5	-20.6	7.4	-10.0	13.0	3.8	...	...	...	...	...	...
Eswatini	3.5	2.2	1.1	2.0	2.4	2.7	-1.6	7.9	3.6	3.1	3.3	2.8
Ethiopia	10.8	10.4	8.0	10.2	7.7	9.0	6.1	6.3	6.4	6.1	6.2	7.0
Gabon	3.1	3.9	2.1	0.5	0.9	3.8	-1.8	1.5	3.0	2.8	2.6	2.8
The Gambia	1.7	4.1	1.9	4.8	7.2	6.2	0.6	5.3	4.9	5.6	6.2	5.0
Ghana	7.1	2.1	3.4	8.1	6.2	6.5	0.5	5.1	3.1	1.2	2.7	5.0
Guinea	3.8	3.8	10.8	10.3	6.4	5.6	4.7	5.0	4.3	5.9	5.6	5.2
Guinea-Bissau	3.5	6.1	5.3	4.8	3.8	4.5	1.5	6.4	4.2	4.5	5.0	4.5
Kenya	4.8	5.0	4.2	3.8	5.7	5.1	-0.3	7.6	4.8	5.0	5.3	5.3
Lesotho	3.5	3.2	1.9	-2.7	-1.3	-2.0	-3.9	1.8	2.1	2.1	2.3	1.6
Liberia	7.0	0.0	-1.6	2.5	1.2	-2.5	-3.0	5.0	4.8	4.6	5.3	7.3
Madagascar	2.9	3.1	4.0	3.9	3.2	4.4	-7.1	5.7	4.0	4.0	4.8	4.5
Malawi	5.8	3.0	2.3	4.0	4.4	5.4	0.9	4.6	0.8	1.7	3.3	4.6
Mali	4.1	6.2	5.9	5.3	4.7	4.8	-1.2	3.1	3.7	4.5	4.8	5.0
Mauritius	3.9	3.7	3.9	3.9	4.0	2.9	-14.6	3.4	8.7	5.1	3.8	3.3
Mozambique	7.3	6.7	3.8	3.7	3.4	2.3	-1.2	2.4	4.2	7.0	5.0	12.1
Namibia	4.3	4.3	0.0	-1.0	1.1	-0.8	-8.1	3.5	4.6	2.8	2.7	2.6
Niger	5.9	4.4	5.7	5.0	7.0	6.1	3.5	1.4	11.9	4.1	11.1	6.0
Nigeria	6.9	2.7	-1.6	0.8	1.9	2.2	-1.8	3.6	3.3	2.9	3.1	3.1
Rwanda	7.8	8.9	6.0	3.9	8.5	9.5	-3.4	10.9	8.2	6.2	7.0	7.3
São Tomé and Príncipe	4.7	1.5	5.2	4.1	4.4	2.0	2.6	1.9	0.1	0.5	2.4	3.7
Senegal	3.3	6.4	6.4	7.4	6.2	4.6	1.3	6.5	4.0	4.1	8.8	5.3
Seychelles	5.2	9.7	12.7	6.6	6.2	5.2	-8.5	2.5	8.9	4.2	3.9	3.6
Sierra Leone	7.6	-20.5	6.4	3.8	3.5	5.3	-2.0	4.1	4.0	2.7	4.7	4.6
South Africa	3.0	1.3	0.7	1.2	1.6	0.3	-6.0	4.7	1.9	0.9	1.8	1.4
South Sudan	...	-0.2	-13.3	-5.8	-2.1	0.9	-6.5	5.3	0.5	3.5	4.2	5.4
Tanzania	6.4	6.2	6.9	6.8	7.0	7.0	4.8	4.9	4.7	5.2	6.1	7.0
Togo	3.8	5.5	5.7	4.0	4.8	4.9	2.0	6.0	5.8	5.4	5.3	5.5
Uganda	7.1	8.0	0.2	6.8	5.6	7.6	-1.2	5.7	6.4	4.6	5.7	6.3
Zambia	7.4	2.9	3.8	3.5	4.0	1.4	-2.8	4.6	4.7	3.6	4.3	5.1
Zimbabwe ¹	2.6	1.8	0.8	5.2	5.0	-6.3	-7.8	8.4	6.2	4.1	3.6	3.0

¹See the country-specific notes for Afghanistan, Eritrea, India, Lebanon, Sri Lanka, Sudan, Türkiye, Ukraine, Uruguay, and Zimbabwe in the "Country Notes" section of the Statistical Appendix.

²Data for Timor-Leste exclude projections for oil exports from the Joint Petroleum Development Area.

³Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.

⁴Data for Syria are excluded for 2011 onward owing to the uncertain political situation.

Table A5. Summary of Inflation
(Percent)

	Average									Projections		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028
GDP Deflators												
Advanced Economies	1.5	1.3	1.0	1.5	1.7	1.5	1.6	3.2	5.4	4.0	2.8	1.9
United States	2.0	1.0	1.0	1.9	2.4	1.8	1.3	4.5	7.0	3.7	2.3	1.9
Euro Area	1.5	1.4	0.9	1.1	1.5	1.7	1.8	2.1	4.6	5.2	3.6	1.9
Japan	-0.7	2.1	0.4	-0.1	0.0	0.6	0.9	-0.2	0.3	3.6	3.1	1.8
Other Advanced Economies ¹	1.9	1.2	1.2	1.9	1.6	1.3	2.1	3.6	5.5	3.1	2.6	2.0
Consumer Prices												
Advanced Economies	1.9	0.3	0.7	1.7	2.0	1.4	0.7	3.1	7.3	4.6	3.0	2.0
United States	2.3	0.1	1.3	2.1	2.4	1.8	1.3	4.7	8.0	4.1	2.8	2.1
Euro Area ²	1.9	0.2	0.2	1.5	1.8	1.2	0.3	2.6	8.4	5.6	3.3	1.9
Japan	0.2	0.8	-0.1	0.5	1.0	0.5	0.0	-0.2	2.5	3.2	2.9	1.6
Other Advanced Economies ¹	2.3	0.5	0.9	1.8	1.9	1.4	0.6	2.5	6.5	5.0	2.9	2.0
Emerging Market and Developing Economies³	6.2	4.8	4.4	4.5	4.9	5.1	5.2	5.9	9.8	8.5	7.8	5.0
Regional Groups												
Emerging and Developing Asia	4.9	2.7	2.9	2.4	2.6	3.3	3.2	2.2	3.8	2.6	2.7	2.8
Emerging and Developing Europe	8.0	10.7	5.6	5.6	6.4	6.7	5.4	9.6	27.9	18.9	19.9	12.4
Latin America and the Caribbean	4.8	5.4	5.5	6.3	6.5	7.6	6.4	9.8	14.0	13.8	10.7	5.7
Middle East and Central Asia	8.5	5.6	5.9	7.1	9.9	7.6	10.4	12.8	14.0	18.0	15.2	7.3
Sub-Saharan Africa	8.3	6.7	10.1	10.5	8.3	8.1	10.1	11.0	14.5	15.8	13.1	7.4
Analytical Groups												
By Source of Export Earnings												
Fuel	8.3	5.6	7.7	6.5	9.0	6.8	9.4	11.8	13.8	14.0	11.1	7.8
Nonfuel	5.8	4.7	4.0	4.2	4.4	4.9	4.7	5.2	9.3	7.9	7.4	4.7
Of which, Primary Products ⁴	7.2	5.9	7.3	13.1	15.6	19.6	21.5	26.1	31.2	42.2	32.0	13.2
By External Financing Source												
Net Debtor Economies	7.0	5.5	5.3	5.7	5.6	5.4	5.9	7.4	12.9	11.6	10.3	6.1
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2018–22	10.2	12.8	10.7	15.3	14.3	11.6	13.9	17.6	21.9	26.1	23.1	8.3
Other Groups												
European Union	2.1	0.1	0.1	1.6	1.9	1.4	0.7	2.9	9.3	6.5	3.6	2.0
Middle East and North Africa	8.2	5.7	5.7	7.2	11.3	8.0	10.8	14.0	14.4	17.5	15.0	7.8
Emerging Market and Middle-Income Economies	5.9	4.6	4.0	4.1	4.6	4.8	4.6	5.3	9.4	7.8	7.4	4.8
Low-Income Developing Countries	9.4	6.5	8.2	9.0	8.8	8.2	11.2	12.8	13.9	15.7	12.2	6.8
Memorandum												
Median Inflation Rate												
Advanced Economies	2.1	0.1	0.4	1.6	1.7	1.4	0.3	2.5	8.1	5.2	3.3	2.0
Emerging Market and Developing Economies ³	5.2	2.6	2.7	3.3	3.1	2.6	2.8	3.9	7.9	6.1	4.4	3.0

¹Excludes the United States, euro area countries, and Japan.

²Based on Eurostat's harmonized index of consumer prices.

³Excludes Venezuela but includes Argentina from 2017 onward. See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.

⁴Includes Argentina from 2017 onward. See the country-specific note for Argentina in the "Country Notes" section of the Statistical Appendix.

Table A6. Advanced Economies: Consumer Prices¹
(Annual percent change)

	Average									Projections			End of Period ²		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028	2022	Projections	
														2023	2024
Advanced Economies	1.9	0.3	0.7	1.7	2.0	1.4	0.7	3.1	7.3	4.6	3.0	2.0	7.2	3.3	2.6
United States	2.3	0.1	1.3	2.1	2.4	1.8	1.3	4.7	8.0	4.1	-2.8	2.1	6.4	3.0	2.6
Euro Area ³	1.9	0.2	0.2	1.5	1.8	1.2	0.3	2.6	8.4	5.6	3.3	1.9	9.2	3.3	2.7
Germany	1.7	0.7	0.4	1.7	1.9	1.4	0.4	3.2	8.7	6.3	3.5	2.0	9.8	4.1	2.8
France	1.6	0.1	0.3	1.2	2.1	1.3	0.5	2.1	5.9	5.6	2.5	1.6	7.0	4.0	1.9
Italy	2.0	0.1	-0.1	1.3	1.2	0.6	-0.1	1.9	8.7	6.0	2.6	2.0	12.3	1.1	3.0
Spain	2.2	-0.6	-0.3	2.0	1.7	0.8	-0.3	3.0	8.3	3.5	3.9	1.7	5.5	4.0	3.4
The Netherlands	1.7	0.2	0.1	1.3	1.6	2.7	1.1	2.8	11.6	4.0	4.2	2.0	11.1	1.4	2.4
Belgium	2.1	0.6	1.8	2.2	2.3	1.3	0.4	3.2	10.3	2.5	4.3	2.0	10.2	0.4	4.0
Ireland	1.1	0.0	-0.2	0.3	0.7	0.9	-0.5	2.4	8.1	5.2	3.0	2.0	8.1	3.4	2.6
Austria	2.1	0.8	1.0	2.2	2.1	1.5	1.4	2.8	8.6	7.8	3.7	2.0	10.5	5.6	3.2
Portugal	1.7	0.5	0.6	1.6	1.2	0.3	-0.1	0.9	8.1	5.3	3.4	2.0	9.8	3.3	2.6
Greece	2.2	-1.1	0.0	1.1	0.8	0.5	-1.3	0.6	9.3	4.1	2.8	1.9	7.6	2.9	2.7
Finland	2.1	-0.2	0.4	0.8	1.2	1.1	0.4	2.1	7.2	4.5	1.9	2.0	8.8	4.5	1.9
Slovak Republic	2.4	-0.3	-0.5	1.4	2.5	2.8	2.0	2.8	12.1	10.9	4.8	1.8	15.0	6.3	4.5
Croatia	2.6	-0.3	-0.6	1.3	1.6	0.8	0.0	2.7	10.7	8.6	4.2	2.1	12.7	6.2	3.2
Lithuania	3.7	-0.7	0.7	3.7	2.5	2.2	1.1	4.6	18.9	9.3	3.9	2.4	20.0	3.5	3.1
Slovenia	2.3	-0.5	-0.1	1.4	1.7	1.6	-0.1	1.9	8.8	7.4	4.2	1.9	10.3	4.8	3.3
Luxembourg	2.5	0.1	0.0	2.1	2.0	1.7	0.0	3.5	8.1	3.2	3.3	2.0	6.3	4.2	1.7
Latvia	4.7	0.2	0.1	2.9	2.6	2.7	0.1	3.2	17.2	9.9	4.2	2.3	20.7	4.6	4.3
Estonia	4.1	0.1	0.8	3.7	3.4	2.3	-0.6	4.5	19.4	10.0	3.8	2.5	17.5	5.2	3.6
Cyprus	2.0	-1.5	-1.2	0.7	0.8	0.6	-1.1	2.2	8.1	3.5	2.4	2.0	7.6	2.2	2.2
Malta	2.2	1.2	0.9	1.3	1.7	1.5	0.8	0.7	6.1	5.8	3.1	2.0	7.5	4.7	2.4
Japan	0.2	0.8	-0.1	0.5	1.0	0.5	0.0	-0.2	2.5	3.2	2.9	1.6	3.9	2.7	2.6
United Kingdom	2.7	0.0	0.7	2.7	2.5	1.8	0.9	2.6	9.1	7.7	3.7	2.0	10.5	5.2	2.4
Korea	2.7	0.7	1.0	1.9	1.5	0.4	0.5	2.5	5.1	3.4	2.3	2.0	5.0	2.9	2.0
Canada	1.8	1.1	1.4	1.6	2.3	1.9	0.7	3.4	6.8	3.6	2.4	2.0	6.6	2.7	2.1
Taiwan Province of China	1.4	-0.3	1.4	0.6	1.4	0.6	-0.2	2.0	2.9	2.1	1.5	1.5	2.7	2.5	1.8
Australia	2.8	1.5	1.3	2.0	1.9	1.6	0.9	2.8	6.6	5.8	4.0	2.6	7.8	4.7	3.4
Switzerland	0.5	-1.1	-0.4	0.5	0.9	0.4	-0.7	0.6	2.8	2.2	2.0	1.5	2.9	1.9	1.9
Singapore	2.7	-0.5	-0.5	0.6	0.4	0.6	-0.2	2.3	6.1	5.5	3.5	2.0	6.5	5.2	3.2
Sweden	1.4	0.7	1.1	1.9	2.0	1.7	0.7	2.7	8.1	6.9	3.6	2.0	11.5	5.8	2.8
Hong Kong SAR	3.0	3.0	2.4	1.5	2.4	2.9	0.3	1.6	1.9	2.2	2.3	2.5	2.0	2.6	2.3
Czech Republic	2.3	0.3	0.7	2.5	2.1	2.8	3.2	3.8	15.1	10.9	4.6	2.0	15.8	8.3	2.2
Israel	2.2	-0.6	-0.5	0.2	0.8	0.8	-0.6	1.5	4.4	4.3	3.0	2.1	5.3	3.6	2.6
Norway	1.9	2.2	3.6	1.9	2.8	2.2	1.3	3.5	5.8	5.8	3.7	2.0	5.9	4.8	3.2
Denmark	1.8	0.2	0.0	1.1	0.7	0.7	0.3	1.9	8.5	4.2	2.8	2.0	9.6	2.5	2.5
New Zealand	2.5	0.3	0.6	1.9	1.6	1.6	1.7	3.9	7.2	4.9	2.7	2.0	7.2	2.8	2.5
Puerto Rico	2.9	-0.8	-0.3	1.8	1.3	0.1	-0.5	2.4	5.9	2.9	1.5	2.7	6.2	1.1	1.9
Macao SAR	5.1	4.6	2.4	1.2	3.0	2.8	0.8	0.0	1.0	0.9	1.7	1.7	0.8	0.9	1.7
Iceland	6.0	1.6	1.7	1.8	2.7	3.0	2.8	4.5	8.3	8.6	4.5	2.5	9.6	7.3	4.0
Andorra	1.9	-1.1	-0.4	2.6	1.0	0.5	0.1	1.7	6.2	5.2	3.5	1.7	7.2	4.4	2.0
San Marino	2.3	0.1	0.6	1.0	1.2	0.5	-0.1	2.1	5.3	5.9	2.5	2.0	7.0	5.9	2.5
<i>Memorandum</i>															
Major Advanced Economies	1.9	0.3	0.8	1.8	2.1	1.5	0.8	3.3	7.3	4.7	2.9	2.0	7.2	3.2	2.5

¹Movements in consumer prices are shown as annual averages.

²Monthly year-over-year changes and, for several countries, on a quarterly basis.

³Based on Eurostat's harmonized index of consumer prices, except in the case of Slovenia.

Table A7. Emerging Market and Developing Economies: Consumer Prices¹
(Annual percent change)

	Average										Projections			End of Period ²		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028	2022	Projections		
														2023	2024	
Emerging and Developing Asia	4.9	2.7	2.9	2.4	2.6	3.3	3.2	2.2	3.8	2.6	2.7	2.8	4.0	2.4	2.8	
Bangladesh	7.7	6.4	5.9	5.4	5.8	5.5	5.6	5.6	6.1	9.0	7.9	5.5	7.6	9.7	7.2	
Bhutan	6.9	6.7	3.3	4.3	3.7	2.8	3.0	8.2	5.9	5.2	4.4	4.0	6.5	3.8	5.1	
Brunei Darussalam	0.6	-0.5	-0.3	-1.3	1.0	-0.4	1.9	1.7	3.7	1.7	1.5	1.0	3.3	1.7	1.5	
Cambodia	6.2	1.2	3.0	2.9	2.5	1.9	2.9	2.9	5.3	2.0	3.0	3.0	2.9	3.0	3.0	
China	2.9	1.5	2.1	1.5	1.9	2.9	2.5	0.9	1.9	0.7	1.7	2.2	1.8	0.9	1.9	
Fiji	3.9	1.4	3.9	3.3	4.1	1.8	-2.6	0.2	4.3	3.0	3.5	3.0	3.1	4.5	2.6	
India	8.4	4.9	4.5	3.6	3.4	4.8	6.2	5.5	6.7	5.5	4.6	4.0	6.2	4.9	4.4	
Indonesia	7.1	6.4	3.5	3.8	3.3	2.8	2.0	1.6	4.2	3.6	2.5	1.6	5.5	2.3	2.5	
Kiribati	2.0	0.6	1.9	0.4	0.6	-1.8	2.6	2.1	5.3	9.0	3.5	1.8	16.2	-2.0	4.0	
Lao P.D.R.	5.4	1.3	1.6	0.8	2.0	3.3	5.1	3.8	23.0	28.1	9.0	3.0	39.3	16.9	3.0	
Malaysia	2.6	2.1	2.1	3.8	1.0	0.7	-1.1	2.5	3.4	2.9	2.7	1.9	3.8	2.9	2.7	
Maldives	6.4	1.4	0.8	2.3	1.4	1.3	-1.6	0.2	2.6	3.5	2.8	2.0	3.3	3.6	2.4	
Marshall Islands	4.0	-2.2	-1.5	0.1	0.8	-0.1	-0.7	2.2	3.2	5.2	2.8	2.0	5.7	3.0	2.6	
Micronesia	4.3	0.0	-0.9	0.1	1.0	2.2	1.0	1.8	5.0	5.3	4.1	2.0	6.9	3.8	3.0	
Mongolia	11.5	6.8	0.7	4.3	6.8	7.3	3.7	7.4	15.2	12.3	12.2	7.0	13.2	11.7	12.8	
Myanmar	10.4	7.3	9.1	4.6	5.9	8.6	5.7	3.6	16.2	14.2	7.8	7.8	20.4	11.1	7.2	
Nauru	4.8	9.8	8.2	5.1	-14.4	4.2	1.0	2.0	4.8	6.1	5.0	1.9	6.4	5.8	4.2	
Nepal	8.4	7.2	9.9	4.5	4.1	4.6	6.1	3.6	6.3	7.8	6.7	5.4	8.1	6.8	6.5	
Palau	4.1	2.2	-1.3	1.1	2.4	0.4	0.7	-0.5	13.2	12.5	4.6	2.3	13.7	9.5	1.8	
Papua New Guinea	4.7	6.0	6.7	5.4	4.4	3.9	4.9	4.5	5.3	5.0	4.9	4.5	3.4	5.7	4.7	
Philippines	4.5	0.7	1.2	2.9	5.3	2.4	2.4	3.9	5.8	5.8	3.2	3.0	8.1	3.6	3.3	
Samoa	4.3	1.9	0.1	1.3	3.7	2.2	1.5	-3.0	8.7	12.0	5.0	3.0	10.8	10.7	4.5	
Solomon Islands	7.5	-0.6	0.5	0.5	3.5	1.6	3.0	-0.1	5.5	4.9	4.0	3.2	8.5	4.4	3.6	
Sri Lanka ³	9.1	2.2	4.0	6.6	4.3	4.3	4.6	6.0	45.2	...	...	...	54.5	...	...
Thailand	3.0	-0.9	0.2	0.7	1.1	0.7	-0.8	1.2	6.1	1.5	1.6	2.0	5.9	0.6	1.8	
Timor-Leste	6.1	0.6	-1.5	0.5	2.3	0.9	0.5	3.8	7.0	6.0	2.5	2.0	6.9	6.0	2.5	
Tonga	5.1	0.1	-0.6	7.2	6.8	3.3	0.4	1.4	8.5	10.2	5.8	3.4	11.3	7.4	6.2	
Tuvalu	2.3	3.1	3.5	4.1	2.2	3.5	1.9	6.2	11.5	6.2	3.8	2.8	13.6	6.2	3.8	
Vanuatu	2.3	2.5	0.8	3.1	2.4	2.7	5.3	2.3	7.0	9.3	5.7	3.0	12.4	8.3	5.6	
Vietnam	10.0	0.6	2.7	3.5	3.5	2.8	3.2	1.8	3.2	3.4	3.4	3.4	4.6	4.1	3.4	
Emerging and Developing Europe	8.0	10.7	5.6	5.6	6.4	6.7	5.4	9.6	27.9	18.9	19.9	12.4	26.7	20.3	17.2	
Albania	2.6	1.9	1.3	2.0	2.0	1.4	1.6	2.0	6.7	4.8	4.0	3.0	7.4	3.8	3.6	
Belarus	19.8	13.5	11.8	6.0	4.9	5.6	5.5	9.5	15.2	4.7	5.7	5.0	12.9	3.4	3.7	
Bosnia and Herzegovina	2.5	-1.0	-1.6	0.8	1.4	0.6	-1.1	2.0	14.0	5.5	3.0	2.0	14.8	2.2	2.1	
Bulgaria	4.2	-1.1	-1.3	1.2	2.6	2.5	1.2	2.8	13.0	8.5	3.0	2.0	14.3	4.7	2.2	
Hungary	4.1	-0.1	0.4	2.4	2.8	3.4	3.3	5.1	14.5	17.7	6.6	3.1	24.5	8.2	5.4	
Kosovo	2.5	-0.5	0.2	1.5	1.1	2.7	0.2	3.3	11.7	4.7	3.1	2.0	12.2	1.5	3.7	
Moldova	7.8	9.6	6.4	6.5	3.6	4.8	3.8	5.1	28.6	13.3	5.0	5.0	30.2	5.0	5.0	
Montenegro	3.1	1.5	-0.3	2.4	2.6	0.4	-0.2	2.4	13.0	8.3	4.3	1.9	17.2	5.1	3.1	
North Macedonia	2.5	-0.3	-0.2	1.4	1.5	0.8	1.2	3.2	14.2	10.0	4.3	2.0	18.7	5.7	2.3	
Poland	2.6	-0.9	-0.7	2.0	1.8	2.2	3.4	5.1	14.4	12.0	6.4	2.5	16.6	7.4	5.5	
Romania	5.4	-0.6	-1.6	1.3	4.6	3.8	2.6	5.0	13.8	10.7	5.8	2.5	16.4	7.8	4.7	
Russia	9.2	15.5	7.0	3.7	2.9	4.5	3.4	6.7	13.8	5.3	6.3	4.0	12.2	5.7	5.0	
Serbia	8.7	1.4	1.1	3.1	2.0	1.8	1.6	4.1	12.0	12.4	5.3	3.0	15.1	8.2	4.0	
Türkiye ³	8.3	7.7	7.8	11.1	16.3	15.2	12.3	19.6	72.3	51.2	62.5	37.4	64.3	64.0	54.3	
Ukraine ³	10.4	48.7	13.9	14.4	10.9	7.9	2.7	9.4	20.2	17.7	13.0	5.0	26.6	15.5	10.0	
Latin America and the Caribbean⁴	4.8	5.4	5.5	6.3	6.5	7.6	6.4	9.8	14.0	13.8	10.7	5.7	14.6	13.6	8.8	
Antigua and Barbuda	2.2	1.0	-0.5	2.4	1.2	1.4	1.1	1.6	7.5	5.0	2.9	2.0	9.2	4.0	2.5	
Argentina ³	...	...	...	25.7	34.3	53.5	42.0	48.4	72.4	121.7	93.7	32.5	94.8	135.7	69.5
Aruba	2.4	0.5	-0.9	-1.0	3.6	3.9	-1.3	0.7	5.5	4.5	2.3	2.0	5.7	3.2	2.2	
The Bahamas	2.0	1.9	-0.3	1.5	2.3	2.5	0.0	2.9	5.6	3.9	3.2	2.0	5.5	3.4	2.6	
Barbados	5.2	-1.1	1.5	4.4	-44.4	2.3	0.5	1.5	5.0	5.2	3.1	2.4	5.7	5.0	3.6	
Belize	2.1	-0.9	0.7	1.1	0.3	0.2	0.1	3.2	6.3	3.7	1.7	1.2	6.7	2.0	1.2	
Bolivia	6.2	4.1	3.6	2.8	2.3	1.8	0.9	0.7	1.7	3.0	4.4	3.8	3.1	3.6	3.8	
Brazil	5.5	9.0	8.7	3.4	3.7	3.7	3.2	8.3	9.3	4.7	4.5	3.0	5.8	4.9	3.9	
Chile	3.5	4.3	3.8	2.2	2.3	2.2	3.0	4.5	11.6	7.8	3.6	3.0	12.8	4.5	3.0	
Colombia	4.0	5.0	7.5	4.3	3.2	3.5	2.5	3.5	10.2	11.4	5.2	3.0	13.1	8.8	4.5	

Table A7. Emerging Market and Developing Economies: Consumer Prices¹ (continued)
(Annual percent change)

	Average									Projections			End of Period ²		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028	2022	2023	2024
Latin America and the Caribbean															
(continued)⁴	4.8	5.4	5.5	6.3	6.5	7.6	6.4	9.8	14.0	13.8	10.7	5.7	14.6	13.6	8.8
Costa Rica	8.0	0.8	0.0	1.6	2.2	2.1	0.7	1.7	8.3	0.7	1.9	3.0	7.9	-0.9	3.0
Dominica	2.0	-0.9	0.1	0.3	1.0	1.5	-0.7	1.6	6.8	6.2	2.8	2.0	6.6	5.0	2.9
Dominican Republic	5.6	0.8	1.6	3.3	3.6	1.8	3.8	8.2	8.8	4.9	4.2	4.0	7.8	4.0	4.0
Ecuador	4.1	4.0	1.7	0.4	-0.2	0.3	-0.3	0.1	3.5	2.3	1.8	1.5	3.7	2.4	1.5
El Salvador	3.1	-0.7	0.6	1.0	1.1	0.1	-0.4	3.5	7.2	4.4	2.4	2.0	7.3	3.1	1.7
Grenada	2.7	-0.6	1.7	0.9	0.8	0.6	-0.7	1.2	2.6	3.6	2.5	2.0	2.9	3.4	2.6
Guatemala	5.7	2.4	4.4	4.4	3.8	3.7	3.2	4.3	6.9	6.3	5.5	4.0	9.2	5.4	4.6
Guyana	5.0	-0.9	0.8	1.9	1.3	2.1	1.2	3.3	6.5	5.5	4.7	5.5	7.2	3.8	5.5
Haiti	7.4	5.3	11.4	10.6	11.4	17.3	22.9	15.9	27.6	43.6	13.4	9.7	38.7	30.1	12.7
Honduras	6.6	3.2	2.7	3.9	4.3	4.4	3.5	4.5	9.1	6.4	4.7	4.0	9.8	5.3	4.2
Jamaica	10.8	3.7	2.3	4.4	3.7	3.9	5.2	5.9	10.3	6.5	5.0	5.0	9.4	5.0	5.0
Mexico	4.1	2.7	2.8	6.0	4.9	3.6	3.4	5.7	7.9	5.5	3.8	3.0	7.8	4.5	3.2
Nicaragua	8.6	4.0	3.5	3.9	4.9	5.4	3.7	4.9	10.5	9.1	5.0	4.0	11.6	7.6	4.8
Panama	4.2	0.1	0.7	0.9	0.8	-0.4	-1.6	1.6	2.9	1.5	1.9	2.0	2.1	2.2	2.2
Paraguay	6.1	3.1	4.1	3.6	4.0	2.8	1.8	4.8	9.8	4.7	4.1	4.0	8.1	4.1	4.0
Peru	2.9	3.5	3.6	2.8	1.3	2.1	1.8	4.0	7.9	6.5	2.9	2.0	8.5	4.2	2.2
St. Kitts and Nevis	3.2	-2.3	-0.7	0.7	-1.0	-0.3	-1.2	1.2	2.7	2.9	2.3	2.0	3.9	2.6	2.3
St. Lucia	3.1	-1.0	-3.1	0.1	2.6	0.5	-1.8	2.4	6.4	3.6	2.0	2.0	6.9	2.2	2.1
St. Vincent and the Grenadines	3.1	-1.7	-0.2	2.2	2.3	0.9	-0.6	1.6	5.7	4.4	2.4	2.0	6.7	3.4	2.0
Suriname	8.0	6.9	55.5	22.0	6.9	4.4	34.9	59.1	52.4	53.3	30.9	5.0	54.6	40.0	20.0
Trinidad and Tobago	7.8	4.7	3.1	1.9	1.0	1.0	0.6	2.1	5.8	5.4	2.9	1.9	8.7	3.5	2.3
Uruguay	7.4	8.7	9.6	6.2	7.6	7.9	9.8	7.7	9.1	6.1	5.9	4.7	8.3	5.4	5.7
Venezuela ³	27.7	121.7	254.9	438.1	65,374.1	19,906.0	2,355.1	1,588.5	186.5	360.0	200.0	...	234.0	250.0	230.0
Middle East and Central Asia															
(continued)⁴	8.5	5.6	5.9	7.1	9.9	7.6	10.4	12.8	14.0	18.0	15.2	7.3	15.9	18.5	12.8
Afghanistan ³	7.5	-0.7	4.4	5.0	0.6	2.3	5.6	5.1	13.7	...	...	...	5.2	...	...
Algeria	4.1	4.8	6.4	5.6	4.3	2.0	2.4	7.2	9.3	9.0	6.8	5.2	9.3	8.0	6.8
Armenia	4.7	3.7	-1.4	1.2	2.5	1.4	1.2	7.2	8.6	3.5	4.0	4.0	8.3	4.0	4.0
Azerbaijan	7.3	4.0	12.4	12.9	2.3	2.6	2.8	6.7	13.9	10.3	5.6	4.0	14.4	6.3	5.0
Bahrain	2.5	1.8	2.8	1.4	2.1	1.0	-2.3	-0.6	3.6	1.0	1.4	2.2	3.6	1.0	1.4
Djibouti	4.1	-0.8	2.7	0.6	0.1	3.3	1.8	1.2	5.2	1.2	1.8	2.5	3.6	2.2	2.5
Egypt	10.0	11.0	10.2	23.5	20.9	13.9	5.7	4.5	8.5	23.5	32.2	9.5	13.2	35.7	25.9
Georgia	5.5	4.0	2.1	6.0	2.6	4.9	5.2	9.6	11.9	2.4	2.7	3.0	9.8	0.8	3.0
Iran	18.9	11.9	9.1	9.6	30.2	34.7	36.4	40.2	45.8	47.0	32.5	25.0	54.0	40.0	25.0
Iraq	12.7	1.4	0.5	0.2	0.4	-0.2	0.6	6.0	5.0	5.3	3.6	2.0	4.3	5.0	3.0
Jordan	4.7	-1.1	-0.6	3.6	4.5	0.7	0.4	1.3	4.2	2.7	2.6	2.5	4.4	2.6	2.6
Kazakhstan	8.4	6.7	14.6	7.4	6.0	5.2	6.8	8.0	15.0	15.0	9.0	5.0	20.3	11.5	7.5
Kuwait	...	3.3	2.9	1.6	0.6	1.1	2.1	3.4	4.0	3.4	3.1	1.9	3.1	...	...
Kyrgyz Republic	9.1	6.5	0.4	3.2	1.5	1.1	6.3	11.9	13.9	11.7	8.6	4.0	14.7	10.0	8.0
Lebanon ⁵	4.0	-3.8	-0.8	4.5	6.1	2.9	84.9	154.8	171.2	...	...	...	122.0	...	...
Libya	5.2	10.0	25.9	25.9	14.0	-2.9	1.5	2.9	4.5	3.4	2.9	2.5	4.1	2.5	2.5
Mauritania	6.0	0.5	1.5	2.3	3.1	2.3	2.4	3.6	9.6	7.5	4.0	4.0	11.0	4.0	4.0
Morocco	1.6	1.4	1.5	0.7	1.6	0.2	0.7	1.4	6.6	6.3	3.5	2.1	8.3	4.0	3.3
Oman	3.9	0.1	1.1	1.6	0.9	0.1	-0.9	1.5	2.8	1.1	1.7	2.0	1.9	-0.7	1.7
Pakistan	10.7	4.5	2.9	4.1	3.9	6.7	10.7	8.9	12.1	29.2	23.6	6.5	21.3	29.4	17.5
Qatar	5.1	0.9	2.7	0.6	0.1	-0.9	-2.5	2.3	5.0	2.8	2.3	2.0	5.9	0.8	2.3
Saudi Arabia	3.4	1.2	2.1	-0.8	2.5	-2.1	3.4	3.1	2.5	2.5	2.2	2.0	2.0	2.5	2.2
Somalia	...	0.9	0.0	4.0	4.3	4.5	4.3	4.6	6.8	5.7	4.1	3.2	6.1	4.6	3.9
Sudan ^{3,5}	19.1	16.9	17.8	32.4	63.3	51.0	163.3	359.1	138.8	256.2	152.4	39.0	87.3	238.3	127.3
Syria ⁶	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tajikistan	9.2	5.8	5.9	7.3	3.8	7.8	8.6	9.0	6.6	4.6	5.7	6.5	4.2	5.0	6.5
Tunisia	4.0	4.4	3.6	5.3	7.3	6.7	5.6	5.7	8.3	9.4	9.8	5.6	10.1	8.5	10.6
Turkmenistan	6.4	7.4	3.6	8.0	13.3	5.1	6.1	19.5	11.2	5.9	10.5	10.0	3.0	11.0	10.0
United Arab Emirates	3.9	4.1	1.6	2.0	3.1	-1.9	-2.1	-0.1	4.8	3.1	2.3	2.0	4.8	3.1	2.3
Uzbekistan	11.8	8.5	8.8	13.9	17.5	14.5	12.9	10.8	11.4	10.2	10.0	5.2	12.3	9.9	10.7
West Bank and Gaza	3.6	1.4	-0.2	0.2	-0.2	1.6	-0.7	1.2	3.7	3.4	2.7	2.0	4.1	3.0	2.5
Yemen	11.0	22.0	21.3	30.4	33.6	15.7	21.7	31.5	29.5	14.9	17.3	10.0	-2.7	20.0	15.0

Table A7. Emerging Market and Developing Economies: Consumer Prices¹ (continued)
(Annual percent change)

	Average										Projections			End of Period ²		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028	2022	2023	2024	
														Projections		
Sub-Saharan Africa	8.3	6.7	10.1	10.5	8.3	8.1	10.1	11.0	14.5	15.8	13.1	7.4	16.2	16.2	10.5	
Angola	12.8	9.2	30.7	29.8	19.6	17.1	22.3	25.8	21.4	13.1	22.3	9.1	13.8	17.2	25.6	
Benin	3.0	0.2	-0.8	1.8	0.8	-0.9	3.0	1.7	1.4	5.0	2.5	2.0	2.9	5.0	2.5	
Botswana	8.1	3.1	2.8	3.3	3.2	2.7	1.9	6.7	12.2	5.9	4.7	4.5	12.4	5.1	4.4	
Burkina Faso	2.6	1.7	0.4	1.5	2.0	-3.2	1.9	3.9	14.1	1.4	3.0	2.0	9.6	2.4	2.0	
Burundi	10.4	5.6	5.5	16.6	-2.8	-0.7	7.3	8.3	18.9	20.1	16.1	10.2	26.6	12.3	22.4	
Cabo Verde	2.8	0.1	-1.4	0.8	1.3	1.1	0.6	1.9	7.9	5.2	2.0	2.0	7.6	5.2	2.0	
Cameroon	2.7	2.7	0.9	0.6	1.1	2.5	2.5	2.3	6.3	7.2	4.8	2.0	7.3	6.3	3.7	
Central African Republic	5.3	1.4	4.9	4.2	1.6	2.8	0.9	4.3	5.8	6.5	3.2	2.6	7.6	5.5	2.5	
Chad	3.3	4.8	-1.6	-0.9	4.0	-1.0	4.5	-0.8	5.8	7.0	3.5	3.0	8.3	4.6	3.1	
Comoros	3.3	0.9	0.8	0.1	1.7	3.7	0.8	0.0	12.4	11.1	1.2	1.9	20.6	0.7	1.6	
Democratic Republic of the Congo	15.0	0.7	3.2	35.7	29.3	4.7	11.4	9.0	9.3	19.1	10.6	7.0	13.1	19.3	7.1	
Republic of Congo	3.3	3.2	3.2	0.4	1.2	0.4	1.4	2.0	3.0	3.5	3.2	3.0	3.2	3.5	3.2	
Côte d'Ivoire	2.1	1.2	0.6	0.6	0.6	0.8	2.4	4.2	5.2	4.3	2.3	2.0	5.1	2.8	2.0	
Equatorial Guinea	4.4	1.7	1.4	0.7	1.3	1.2	4.8	-0.1	4.9	2.4	4.0	2.0	5.0	1.7	5.2	
Eritrea ³	11.9	28.5	-5.6	-13.3	-14.4	1.3	...	...	...	...	...	...	...	...	...
Eswatini	6.9	5.0	7.8	6.2	4.8	2.6	3.9	3.7	4.8	5.5	5.0	4.3	5.6	5.6	4.3	
Ethiopia	17.1	9.6	6.6	10.7	13.8	15.8	20.4	26.8	33.9	29.1	20.7	12.6	33.8	24.5	18.5	
Gabon	1.6	-0.1	2.1	2.7	4.8	2.0	1.7	1.1	4.3	3.8	2.5	2.2	5.4	3.0	2.4	
The Gambia	4.7	6.8	7.2	8.0	6.5	7.1	5.9	7.4	11.5	17.0	12.3	5.0	13.7	17.5	7.1	
Ghana	11.5	17.2	17.5	12.4	9.8	7.1	9.9	10.0	31.9	42.2	23.2	8.0	54.1	31.3	15.0	
Guinea	18.2	8.2	8.2	8.9	9.8	9.5	10.6	12.6	10.5	8.3	7.9	7.5	8.6	8.0	7.8	
Guinea-Bissau	2.6	1.5	2.7	-0.2	0.4	0.3	1.5	3.3	7.9	7.0	3.0	2.0	9.5	1.8	3.0	
Kenya	8.5	6.6	6.3	8.0	4.7	5.2	5.3	6.1	7.6	7.7	6.6	5.0	9.1	7.1	6.5	
Lesotho	6.0	3.2	6.6	4.4	4.8	5.2	5.0	6.0	8.2	6.9	5.6	4.9	7.9	5.9	5.0	
Liberia	9.2	7.7	8.8	12.4	23.5	27.0	17.0	7.8	7.6	10.6	8.0	4.9	9.2	12.1	6.0	
Madagascar	9.3	7.4	6.1	8.6	8.6	5.6	4.2	5.8	8.2	10.5	8.8	6.0	10.8	9.3	8.6	
Malawi	14.1	21.9	21.7	11.5	9.2	9.4	8.6	9.3	20.8	27.7	19.8	6.5	25.4	29.0	15.2	
Mali	3.0	1.4	-1.8	2.4	1.9	-3.0	0.5	3.8	9.7	5.0	2.8	2.0	7.8	3.0	2.0	
Mauritius	5.5	1.3	1.0	3.7	3.2	0.5	2.5	4.0	10.8	7.8	6.5	3.7	12.2	6.4	7.8	
Mozambique	8.0	3.6	17.4	15.1	3.9	2.8	3.1	5.7	9.8	7.4	6.5	5.5	10.3	6.7	6.5	
Namibia	6.0	3.4	6.7	6.1	4.3	3.7	2.2	3.6	6.1	6.0	4.9	4.9	6.9	5.3	5.3	
Niger	2.5	1.0	0.2	0.2	2.8	-2.5	2.9	3.8	4.2	4.6	6.6	2.0	3.1	8.8	2.5	
Nigeria	10.8	9.0	15.7	16.5	12.1	11.4	13.2	17.0	18.8	25.1	23.0	14.0	21.3	30.6	15.4	
Rwanda	7.2	2.5	5.7	4.8	1.4	2.4	7.7	0.8	13.9	14.5	6.0	5.0	21.6	7.8	5.5	
São Tomé and Príncipe	15.9	6.1	5.4	5.7	7.9	7.7	9.8	8.1	18.0	20.8	11.9	5.0	25.2	15.4	7.2	
Senegal	1.9	0.9	1.2	1.1	0.5	1.0	2.5	2.2	9.7	6.1	3.3	-12.4	12.8	4.2	0.3	
Seychelles	7.9	4.0	-1.0	2.9	3.7	1.8	1.2	9.8	2.6	-0.8	2.0	3.5	2.5	-1.1	2.4	
Sierra Leone	8.7	6.7	10.9	18.2	16.0	14.8	13.4	11.9	27.2	42.9	29.8	8.9	37.1	37.8	21.7	
South Africa	6.0	4.6	6.3	5.3	4.6	4.1	3.3	4.6	6.9	5.8	4.8	4.5	7.4	5.2	4.5	
South Sudan	...	53.0	346.1	213.0	83.4	49.3	24.0	30.2	-3.2	16.3	13.6	7.9	-13.0	45.6	6.1	
Tanzania	9.0	5.6	5.2	5.3	3.5	3.4	3.3	3.7	4.4	4.0	4.0	4.0	4.9	4.0	4.0	
Togo	2.7	1.8	0.9	-0.2	0.9	0.7	1.8	4.5	7.6	5.0	2.8	1.7	7.7	2.7	2.2	
Uganda	9.2	3.7	5.2	5.6	2.5	2.1	2.8	2.2	7.2	5.8	4.7	5.0	10.2	3.5	5.0	
Zambia	10.2	10.1	17.9	6.6	7.5	9.2	15.7	22.0	11.0	10.6	9.6	7.0	9.9	11.4	7.9	
Zimbabwe ³	-2.7	-2.4	-1.6	0.9	10.6	255.3	557.2	98.5	193.4	314.5	222.4	20.8	243.8	396.2	190.2	

¹Movements in consumer prices are shown as annual averages.

²Monthly year-over-year changes and, for several countries, on a quarterly basis.

³See the country-specific notes for Afghanistan, Argentina, Eritrea, Lebanon, Sri Lanka, Sudan, Türkiye, Ukraine, Venezuela, and Zimbabwe in the "Country Notes" section of the Statistical Appendix.

⁴Excludes Venezuela but includes Argentina from 2017 onward. See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.

⁵Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.

⁶Data for Syria are excluded for 2011 onward owing to the uncertain political situation.

Table A8. Major Advanced Economies: General Government Fiscal Balances and Debt¹*(Percent of GDP, unless noted otherwise)*

	Average									Projections		
	2005–14	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2028
Major Advanced Economies												
Net Lending/Borrowing	-5.2	-3.0	-3.3	-3.3	-3.3	-3.8	-11.6	-9.1	-4.1	-6.5	-5.6	-5.0
Output Gap ²	-2.2	-2.0	-1.7	-0.8	0.1	0.3	-3.2	0.0	0.7	0.6	0.2	0.5
Structural Balance ²	-4.0	-2.2	-2.7	-3.0	-3.2	-3.8	-8.1	-8.1	-5.3	-6.5	-5.5	-5.2
United States												
Net Lending/Borrowing ³	-6.5	-3.5	-4.4	-4.8	-5.3	-5.7	-14.0	-11.6	-3.7	-8.2	-7.4	-7.0
Output Gap ²	-4.0	-2.5	-2.1	-1.3	0.0	0.7	-2.5	1.5	1.4	1.4	0.8	0.9
Structural Balance ²	-4.4	-2.5	-3.6	-4.3	-5.1	-6.0	-10.7	-11.3	-6.5	-8.8	-7.6	-7.3
Net Debt	63.9	80.9	81.8	80.4	81.1	83.1	98.3	98.3	95.1	96.7	100.7	111.6
Gross Debt	86.1	105.1	107.2	106.2	107.4	108.7	133.5	126.4	121.3	123.3	126.9	137.5
Euro Area												
Net Lending/Borrowing	-3.3	-1.9	-1.5	-0.9	-0.4	-0.6	-7.1	-5.3	-3.6	-3.4	-2.7	-2.1
Output Gap ²	-0.7	-2.4	-1.8	-0.6	-0.2	0.0	-4.8	-2.0	0.2	-0.4	-0.5	0.1
Structural Balance ²	-2.7	-0.5	-0.5	-0.4	-0.2	-0.5	-3.9	-3.5	-2.4	-2.7	-2.4	-2.1
Net Debt	64.6	75.1	74.6	72.5	70.8	69.2	79.1	77.7	75.3	74.6	73.9	72.2
Gross Debt	80.2	90.9	90.1	87.7	85.7	83.7	96.8	94.8	91.0	89.6	88.3	84.9
Germany												
Net Lending/Borrowing	-1.3	1.0	1.2	1.3	1.9	1.5	-4.3	-3.6	-2.5	-2.9	-1.7	-0.5
Output Gap ²	-0.1	-0.4	0.1	1.0	0.8	0.4	-3.1	-1.1	0.6	-0.9	-1.1	0.0
Structural Balance ²	-0.9	1.2	1.2	1.2	1.6	1.3	-2.9	-3.0	-2.1	-2.4	-1.1	-0.5
Net Debt	57.5	52.2	49.3	45.5	42.8	40.7	46.1	47.2	45.8	46.5	45.7	41.7
Gross Debt	73.3	71.9	69.0	65.2	61.9	59.5	68.7	69.0	66.1	65.9	64.0	57.5
France												
Net Lending/Borrowing	-4.4	-3.6	-3.6	-3.0	-2.3	-3.1	-9.0	-6.5	-4.8	-4.9	-4.5	-3.6
Output Gap ²	-0.6	-2.4	-2.7	-1.5	-0.8	0.0	-4.7	-1.9	-0.9	-0.8	-0.7	0.1
Structural Balance ²	-4.0	-2.1	-1.9	-1.9	-1.5	-2.1	-5.8	-5.1	-4.2	-4.3	-4.1	-3.7
Net Debt	70.3	86.3	89.2	89.4	89.2	88.9	101.2	100.4	101.4	99.6	100.1	100.4
Gross Debt	80.0	95.6	98.0	98.1	97.8	97.4	114.7	113.0	111.8	110.0	110.5	110.8
Italy⁴												
Net Lending/Borrowing	-3.3	-2.6	-2.4	-2.4	-2.2	-1.5	-9.7	-9.0	-8.0	-5.0	-4.0	-2.5
Output Gap ²	-1.2	-4.4	-3.5	-2.2	-1.6	-1.5	-6.7	-4.0	-0.4	-0.4	-0.5	0.3
Structural Balance ²	-2.9	-0.2	-0.8	-1.3	-1.4	-0.7	-5.6	-4.8	-1.9	-2.1	-3.4	-2.7
Net Debt	106.7	122.2	121.6	121.3	121.8	121.7	141.5	137.4	132.7	132.6	132.5	130.6
Gross Debt	117.3	135.3	134.8	134.2	134.4	134.1	154.9	149.9	144.4	143.7	143.2	140.1
Japan												
Net Lending/Borrowing	-6.4	-3.7	-3.6	-3.1	-2.5	-3.0	-9.1	-6.2	-6.9	-5.6	-3.7	-3.3
Output Gap ²	0.2	-0.2	0.1	1.0	1.9	0.7	-2.9	-1.6	-0.9	0.2	0.3	0.0
Structural Balance ²	-6.2	-4.5	-4.5	-3.7	-3.0	-3.3	-8.1	-5.5	-6.8	-5.7	-3.8	-3.3
Net Debt	120.8	144.5	149.5	148.1	151.1	151.7	162.3	156.7	161.5	158.5	155.8	153.2
Gross Debt ⁵	201.5	228.3	232.4	231.3	232.4	236.4	258.6	255.1	260.1	255.2	251.9	252.8
United Kingdom⁴												
Net Lending/Borrowing	-5.9	-4.5	-3.3	-2.4	-2.2	-2.2	-13.0	-8.3	-5.5	-4.5	-3.9	-3.5
Output Gap ²	-2.7	-2.6	-2.2	-1.3	-1.0	-0.8	-3.6	0.5	1.8	0.1	-1.0	0.0
Structural Balance ²	-3.9	-2.5	-1.6	-1.3	-1.4	-1.6	0.8	-3.6	-3.8	-3.3	-2.4	-3.5
Net Debt	57.5	78.2	77.6	76.2	75.4	74.6	93.6	94.1	98.9	99.0	99.6	96.5
Gross Debt	64.1	86.7	86.6	85.6	85.2	84.5	104.6	105.2	101.9	104.1	105.9	108.2
Canada												
Net Lending/Borrowing	-1.0	-0.1	-0.5	-0.1	0.4	0.0	-10.9	-4.4	-0.8	-0.7	-0.6	-0.2
Output Gap ²	0.1	-0.1	-0.9	0.4	0.6	0.4	-3.4	-1.4	0.8	0.0	-0.4	0.0
Structural Balance ²	-1.1	0.0	0.0	-0.3	0.0	-0.2	-8.1	-3.3	-1.4	-0.8	-0.4	-0.2
Net Debt ⁶	25.9	18.5	18.0	12.5	11.6	8.5	15.7	15.4	14.2	14.6	14.6	13.8
Gross Debt	78.9	92.0	92.4	90.9	90.8	90.2	118.9	115.1	107.4	106.4	103.3	94.7

Note: The methodology and specific assumptions for each country are discussed in Box A1. The country group composites for fiscal data are calculated as the sum of the US dollar values for the relevant individual countries.

¹Debt data refer to the end of the year and are not always comparable across countries. Gross and net debt levels reported by national statistical agencies for countries that have adopted the System of National Accounts 2008 (Australia, Canada, Hong Kong SAR, United States) are adjusted to exclude unfunded pension liabilities of government employees' defined-benefit pension plans.

²Percent of potential GDP.

³Figures reported by the national statistical agency are adjusted to exclude items related to the accrual-basis accounting of government employees' defined-benefit pension plans.

⁴See the country-specific notes for Italy and the United Kingdom in the "Country Notes" section of the Statistical Appendix.

⁵Nonconsolidated basis.

⁶Includes equity shares.

Table A9. Summary of World Trade Volumes and Prices*(Annual percent change, unless noted otherwise)*

	Averages										Projections	
	2005–14	2015–24	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Trade in Goods and Services												
World Trade¹												
Volume	4.7	2.8	2.9	2.2	5.6	4.0	1.2	-7.8	10.9	5.1	0.9	3.5
Price Deflator												
In US Dollars	2.9	0.5	-13.2	-4.0	4.3	5.4	-2.5	-2.1	12.5	6.8	-1.7	1.6
In SDRs	2.6	1.7	-5.8	-3.4	4.6	3.3	-0.1	-2.9	10.0	13.8	-1.9	1.5
Volume of Trade												
Exports												
Advanced Economies	4.0	2.6	3.8	2.0	5.0	3.5	1.5	-8.8	9.8	5.3	1.8	3.1
Emerging Market and Developing Economies	6.3	3.1	1.9	2.8	6.5	4.2	0.8	-5.1	12.8	4.1	-0.1	4.2
Imports												
Advanced Economies	3.2	2.9	4.8	2.5	4.8	3.8	2.1	-8.2	10.3	6.7	0.1	3.0
Emerging Market and Developing Economies	8.0	2.4	-0.7	1.5	7.4	5.1	-0.9	-7.9	11.8	3.2	1.7	4.4
Terms of Trade												
Advanced Economies	-0.3	0.3	1.8	1.1	-0.2	-0.4	0.1	0.9	0.8	-2.0	0.2	0.5
Emerging Market and Developing Economies	1.2	-0.5	-3.9	-1.5	1.4	1.0	-1.6	-0.8	0.7	0.9	-1.5	0.2
Trade in Goods												
World Trade¹												
Volume	4.5	2.6	2.3	2.1	5.6	3.8	0.2	-5.0	11.2	3.4	-0.3	3.2
Price Deflator												
In US Dollars	3.0	0.4	-14.6	-4.8	4.9	5.8	-3.1	-2.6	14.2	8.3	-2.5	1.5
In SDRs	2.7	1.7	-7.2	-4.2	5.2	3.6	-0.7	-3.4	11.6	15.4	-2.7	1.4
World Trade Prices in US Dollars²												
Manufactures	1.9	0.7	-3.0	-5.2	0.1	2.0	0.5	-3.2	6.6	10.1	-1.8	2.3
Oil	9.8	-1.8	-47.1	-15.0	22.5	29.4	-10.4	-32.0	65.8	39.2	-16.5	-0.7
Nonfuel Primary Commodities	6.2	1.8	-17.0	-0.3	6.4	1.3	0.7	6.6	26.7	7.9	-6.3	-2.7
Food	4.6	1.3	-16.9	1.5	3.8	-1.2	-3.1	1.7	27.0	14.8	-6.8	-1.9
Beverages	8.4	0.3	-7.4	-3.0	-3.8	-9.2	-5.7	2.4	22.4	14.1	0.5	-3.1
Agricultural Raw Materials	3.1	-1.0	-11.3	-0.2	5.4	2.0	-5.4	-3.4	15.5	5.7	-15.1	0.5
Metal	8.0	1.7	-27.3	-5.3	22.2	6.6	3.9	3.5	46.7	-5.6	-4.7	-7.1
World Trade Prices in SDRs²												
Manufactures	1.6	2.0	5.3	-4.6	0.3	-0.1	3.0	-3.9	4.3	17.3	-2.0	2.2
Oil	9.5	-0.6	-42.6	-14.5	22.8	26.7	-8.2	-32.6	62.1	48.2	-16.6	-0.8
Nonfuel Primary Commodities	5.9	3.1	-9.9	0.4	6.7	-0.8	3.2	5.7	23.9	14.9	-6.4	-2.7
Food	4.4	2.6	-9.8	2.2	4.1	-3.3	-0.7	0.9	24.1	22.3	-6.9	-1.9
Beverages	8.2	1.6	0.5	-2.3	-3.5	-11.1	-3.4	1.6	19.7	21.6	0.3	-3.1
Agricultural Raw Materials	2.8	0.3	-3.7	0.5	5.7	-0.1	-3.1	-4.2	12.9	12.6	-15.3	0.4
Metal	7.7	3.0	-21.1	-4.7	22.5	4.4	6.4	2.6	43.4	0.6	-4.9	-7.2
World Trade Prices in Euros²												
Manufactures	1.2	2.7	16.2	-5.0	-1.9	-2.5	6.1	-5.0	2.8	23.6	-4.9	1.7
Oil	9.1	0.1	-36.7	-14.8	20.0	23.6	-5.4	-33.3	59.9	56.3	-19.1	-1.2
Nonfuel Primary Commodities	5.5	3.8	-0.7	0.0	4.3	-3.2	6.2	4.5	22.2	21.2	-9.2	-3.1
Food	3.9	3.3	-0.5	1.8	1.7	-5.6	2.3	-0.2	22.4	29.0	-9.7	-2.4
Beverages	7.7	2.3	10.9	-2.7	-5.7	-13.2	-0.5	0.5	18.1	28.2	-2.7	-3.5
Agricultural Raw Materials	2.4	1.0	6.3	0.1	3.3	-2.5	-0.2	-5.2	11.3	18.8	-17.8	0.0
Metal	7.3	3.7	-12.9	-5.0	19.7	1.9	9.6	1.5	41.5	6.0	-7.7	-7.6

Table A9. Summary of World Trade Volumes and Prices (continued)
(Annual percent change, unless noted otherwise)

	Averages										Projections	
	2005–14	2015–24	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Trade in Goods (continued)												
Volume of Trade												
Exports												
Advanced Economies	3.7	2.4	3.1	1.6	4.9	3.0	0.6	-6.3	10.1	3.6	1.1	2.8
Emerging Market and Developing Economies	6.1	2.8	1.4	2.6	6.5	3.9	-0.5	-1.2	12.0	1.2	-1.4	3.8
Fuel Exporters	...	...	...	...	...	...	...	...	...	...	...	...
Nonfuel Exporters	6.8	3.1	1.1	2.9	7.5	4.8	0.1	-0.3	13.2	0.4	-1.6	3.8
Imports												
Advanced Economies	3.1	2.6	3.7	2.2	4.8	3.7	0.6	-5.7	11.2	5.3	-1.2	2.7
Emerging Market and Developing Economies	7.7	2.7	-0.3	2.1	7.4	5.2	-0.1	-5.6	12.3	2.2	0.6	3.8
Fuel Exporters	...	...	...	...	...	...	...	...	...	...	...	...
Nonfuel Exporters	7.5	3.1	-0.3	3.6	8.7	6.3	-0.4	-4.8	13.5	1.4	0.2	3.9
Price Deflators in SDRs												
Exports												
Advanced Economies	1.7	1.5	-6.4	-2.2	4.3	2.8	-1.4	-2.2	10.0	12.2	-2.2	2.0
Emerging Market and Developing Economies	5.1	1.8	-9.1	-6.9	7.1	4.9	0.3	-5.6	15.1	19.2	-4.3	0.8
Fuel Exporters	...	...	...	...	...	...	...	...	...	...	...	...
Nonfuel Exporters	4.3	2.2	-3.6	-6.3	5.5	3.1	1.1	-2.7	12.0	16.3	-2.7	1.1
Imports												
Advanced Economies	2.1	1.4	-8.0	-3.5	4.5	3.4	-1.5	-3.4	9.4	14.8	-1.9	1.7
Emerging Market and Developing Economies	3.7	2.2	-5.1	-5.5	5.7	3.7	0.7	-3.0	13.9	16.6	-3.0	0.8
Fuel Exporters	...	...	...	...	...	...	...	...	...	...	...	...
Nonfuel Exporters	3.6	2.2	-5.5	-5.9	6.1	4.0	0.4	-3.2	14.3	16.6	-3.1	0.6
Terms of Trade												
Advanced Economies	-0.4	0.2	1.8	1.3	-0.2	-0.6	0.1	1.2	0.6	-2.3	-0.3	0.3
Emerging Market and Developing Economies	1.4	-0.5	-4.2	-1.5	1.3	1.1	-0.4	-2.7	1.0	2.2	-1.3	0.0
Regional Groups												
Emerging and Developing Asia	-0.3	-0.1	8.1	0.2	-3.4	-2.4	1.1	0.6	-6.9	0.7	-0.2	1.5
Emerging and Developing Europe	2.1	0.1	-9.3	-5.5	3.4	4.3	0.4	-4.2	8.4	2.9	0.9	0.9
Latin America and the Caribbean	1.8	-0.2	-8.8	0.9	4.5	-0.7	-0.7	2.3	4.8	-3.2	2.7	-3.2
Middle East and Central Asia	...	...	...	...	...	...	...	...	...	...	...	...
Sub-Saharan Africa	3.6	-0.4	-14.6	-1.4	9.4	5.0	-2.0	-0.2	11.0	-0.9	-6.5	-1.1
Analytical Groups												
By Source of Export Earnings												
Fuel	...	...	...	...	...	...	...	...	...	...	...	...
Nonfuel	0.7	0.0	2.1	-0.4	-0.5	-0.9	0.8	0.5	-2.0	-0.2	0.4	0.5
Memorandum												
World Exports in Billions of US Dollars												
Goods and Services	19,137	25,944	21,135	20,760	22,906	25,097	24,705	22,327	27,937	31,188	30,868	32,514
Goods	15,165	19,825	16,191	15,736	17,450	19,099	18,531	17,203	21,814	24,200	23,451	24,576
Average Oil Price ³	9.8	-1.8	-47.1	-15.0	22.5	29.4	-10.4	-32.0	65.8	39.2	-16.5	-0.7
In US Dollars a Barrel	83.62	64.49	50.91	43.26	52.98	68.53	61.43	41.77	69.25	96.36	80.49	79.92
Export Unit Value of Manufactures ⁴	1.9	0.7	-3.0	-5.2	0.1	2.0	0.5	-3.2	6.6	10.1	-1.8	2.3

¹Average of annual percent change for world exports and imports.

²As represented, respectively, by the export unit value index for manufactures of the advanced economies and accounting for 82 percent of the advanced economies' trade (export of goods) weights; the average of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil prices; and the average of world market prices for nonfuel primary commodities weighted by their 2014–16 shares in world commodity imports.

³Percent change of average of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil prices.

⁴Percent change for manufactures exported by advanced economies.

Table A10. Summary of Current Account Balances
(Billions of US dollars)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Advanced Economies	269.2	362.3	470.6	383.7	388.3	157.4	502.7	-234.8	111.3	192.9	286.8
United States	-408.5	-396.2	-367.6	-439.8	-441.8	-597.1	-831.4	-971.6	-795.1	-783.2	-777.3
Euro Area	317.0	360.1	394.9	382.1	323.8	230.0	416.3	-106.0	186.6	223.6	343.5
Germany	288.3	299.0	289.1	316.2	317.8	274.2	329.8	170.8	265.6	309.1	331.0
France	-9.0	-12.0	-19.9	-23.2	14.0	-42.8	10.7	-56.8	-37.5	-41.2	-14.0
Italy	26.6	49.7	52.1	54.5	66.6	73.1	65.0	-24.5	15.3	19.8	53.6
Spain	24.2	39.1	36.4	26.7	29.4	7.9	11.0	8.7	33.2	33.7	35.3
Japan	136.4	197.8	203.5	177.8	176.3	149.9	196.8	90.6	141.2	157.0	167.5
United Kingdom	-148.8	-148.7	-96.9	-117.3	-80.9	-86.6	-46.9	-116.1	-122.0	-131.4	-162.0
Canada	-54.4	-47.2	-46.2	-41.0	-34.1	-35.5	-5.4	-7.0	-20.9	-21.4	-55.3
Other Advanced Economies ¹	349.6	328.0	332.1	333.1	344.0	382.5	588.5	591.8	539.3	546.8	575.9
Emerging Market and Developing Economies	-94.6	-111.7	-32.5	-64.1	-10.4	143.9	363.7	645.7	195.8	171.1	-196.8
Regional Groups											
Emerging and Developing Asia	293.1	209.1	163.5	-54.0	93.2	319.2	286.5	296.8	190.5	171.2	2.8
Emerging and Developing Europe	31.4	-10.3	-25.0	62.7	49.4	2.0	66.5	123.1	-20.7	-13.5	-51.5
Latin America and the Caribbean	-181.9	-109.4	-99.1	-146.1	-112.8	-15.8	-102.9	-142.3	-115.3	-103.9	-109.5
Middle East and Central Asia	-144.3	-146.6	-38.2	111.4	15.6	-116.0	132.0	406.8	194.6	176.0	26.3
Sub-Saharan Africa	-92.9	-54.5	-33.7	-38.1	-55.8	-45.5	-18.4	-38.7	-53.3	-58.7	-64.8
Analytical Groups											
By Source of Export Earnings											
Fuel	-150.7	-98.8	40.5	199.7	67.9	-95.1	187.9	505.8	247.2	235.7	102.5
Nonfuel	58.0	-10.8	-70.8	-261.7	-76.5	241.0	177.6	142.7	-48.7	-62.0	-296.6
Of which, Primary Products	-60.9	-40.7	-51.5	-57.0	-27.6	5.1	10.1	-27.5	-32.6	-25.6	-24.8
By External Financing Source											
Net Debtor Economies	-340.4	-236.5	-271.0	-366.3	-267.1	-105.0	-333.9	-472.8	-372.4	-384.4	-504.7
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2018–22	-80.6	-76.7	-63.8	-53.9	-52.2	-35.4	-38.1	-33.3	-46.0	-56.7	-57.8
<i>Memorandum</i>											
World	174.6	250.6	438.1	319.6	377.9	301.3	866.4	410.9	307.2	364.0	90.0
European Union	432.2	467.5	482.8	490.2	469.6	410.7	634.4	178.2	431.5	479.1	582.7
Middle East and North Africa	-121.7	-122.4	-20.2	128.7	34.7	-99.2	132.2	392.7	194.5	178.0	55.2
Emerging Market and Middle-Income Economies	-18.1	-67.5	2.4	-8.0	45.3	195.5	441.6	740.2	262.6	240.3	-103.0
Low-Income Developing Countries	-76.6	-44.1	-34.9	-56.1	-55.7	-51.6	-77.9	-94.6	-66.8	-69.2	-93.8

Table A10. Summary of Current Account Balances (continued)
(Percent of GDP)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Advanced Economies	0.6	0.8	1.0	0.7	0.7	0.3	0.9	-0.4	0.2	0.3	0.4
United States	-2.2	-2.1	-1.9	-2.1	-2.1	-2.8	-3.6	-3.8	-3.0	-2.8	-2.4
Euro Area	2.7	3.0	3.1	2.8	2.4	1.8	2.8	-0.7	1.2	1.4	1.8
Germany	8.6	8.6	7.8	8.0	8.2	7.1	7.7	4.2	6.0	6.6	6.1
France	-0.4	-0.5	-0.8	-0.8	0.5	-1.6	0.4	-2.0	-1.2	-1.3	-0.4
Italy ²	1.4	2.6	2.7	2.6	3.3	3.9	3.1	-1.2	0.7	0.9	2.1
Spain	2.0	3.2	2.8	1.9	2.1	0.6	0.8	0.6	2.1	2.0	1.8
Japan	3.1	4.0	4.1	3.5	3.4	3.0	3.9	2.1	3.3	3.7	3.2
United Kingdom ²	-5.1	-5.5	-3.6	-4.1	-2.8	-3.2	-1.5	-3.8	-3.7	-3.7	-3.5
Canada	-3.5	-3.1	-2.8	-2.4	-2.0	-2.2	-0.3	-0.3	-1.0	-1.0	-2.0
Other Advanced Economies ¹	5.4	5.0	4.7	4.4	4.7	5.2	7.0	7.0	6.2	6.1	5.3
Emerging Market and Developing Economies	-0.3	-0.4	-0.1	-0.2	0.0	0.4	0.9	1.5	0.4	0.4	-0.3
Regional Groups											
Emerging and Developing Asia	1.9	1.3	0.9	-0.3	0.5	1.5	1.2	1.2	0.7	0.6	0.0
Emerging and Developing Europe	1.0	-0.3	-0.7	1.6	1.3	0.1	1.5	2.6	-0.4	-0.3	-0.8
Latin America and the Caribbean	-3.5	-2.2	-1.8	-2.7	-2.1	-0.4	-2.0	-2.4	-1.8	-1.5	-1.3
Middle East and Central Asia	-3.9	-4.0	-1.0	2.9	0.4	-3.4	3.3	8.6	4.1	3.6	0.4
Sub-Saharan Africa	-5.7	-3.6	-2.1	-2.2	-3.2	-2.7	-1.0	-1.9	-2.7	-2.8	-2.3
Analytical Groups											
By Source of Export Earnings											
Fuel	-4.3	-3.0	1.2	5.5	1.9	-3.2	5.3	11.6	5.8	5.3	1.9
Nonfuel	0.2	0.0	-0.2	-0.8	-0.2	0.8	0.5	0.4	-0.1	-0.1	-0.6
Of which, Primary Products	-3.7	-2.6	-3.0	-3.4	-1.7	0.4	0.6	-1.5	-1.7	-1.3	-1.1
By External Financing Source											
Net Debtor Economies	-2.6	-1.8	-1.9	-2.5	-1.7	-0.7	-2.1	-2.7	-1.9	-1.9	-1.9
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2018–22	-5.9	-5.7	-4.9	-3.9	-3.6	-2.5	-2.4	-1.9	-2.7	-3.3	-2.4
<i>Memorandum</i>											
World	0.2	0.3	0.5	0.4	0.4	0.4	0.9	0.4	0.3	0.3	0.1
European Union	3.2	3.4	3.3	3.1	3.0	2.7	3.7	1.1	2.4	2.5	2.6
Middle East and North Africa	-4.1	-4.1	-0.7	4.1	1.1	-3.6	4.1	10.2	5.2	4.6	1.2
Emerging Market and Middle-Income Economies	-0.1	-0.2	0.0	0.0	0.1	0.6	1.2	1.9	0.6	0.6	-0.2
Low-Income Developing Countries	-3.8	-2.2	-1.7	-2.6	-2.4	-2.2	-3.1	-3.5	-2.4	-2.4	-2.2

Table A10. Summary of Current Account Balances (continued)
(Percent of exports of goods and services)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Advanced Economies	2.0	2.7	3.2	2.4	2.5	1.1	2.9	-1.2	0.6	1.0	1.2
United States	-17.9	-17.7	-15.4	-17.3	-17.3	-27.6	-32.4	-32.2	-26.4	-25.4	-21.2
Euro Area	9.8	11.1	11.1	9.9	8.5	6.6	10.0	-2.4	...	...	...
Germany	18.3	18.7	16.6	16.8	17.3	16.2	16.3	8.3	12.4	13.8	13.0
France	-1.2	-1.5	-2.4	-2.5	1.6	-5.7	1.2	-5.6	-3.7	-3.9	-1.2
Italy	4.9	9.0	8.6	8.3	10.5	13.1	9.4	-3.3	1.9	2.3	5.5
Spain	6.0	9.4	7.9	5.3	6.0	2.0	2.2	1.5	5.2	5.0	4.3
Japan	17.4	24.4	23.2	19.1	19.5	18.9	21.4	9.8	15.1	15.6	14.6
United Kingdom	-18.3	-19.1	-11.8	-13.0	-9.1	-10.9	-5.2	-11.5	-11.9	-11.9	-12.0
Canada	-11.0	-9.8	-8.9	-7.4	-6.0	-7.3	-0.9	-1.0	-3.0	-3.0	-6.4
Other Advanced Economies ¹	9.4	9.0	8.3	7.7	8.2	9.7	11.9	11.0	10.1	9.7	8.5
Emerging Market and Developing Economies	-1.1	-1.5	-0.4	-0.8	-0.2	1.8	3.4	5.1	1.6	1.3	-1.4
Regional Groups											
Emerging and Developing Asia	7.7	5.7	4.0	-1.2	2.1	7.3	5.1	4.9	3.2	2.8	0.0
Emerging and Developing Europe	2.7	-0.9	-1.9	4.2	3.3	0.1	3.8	6.3	-1.1	-0.7	-2.2
Latin America and the Caribbean	-16.7	-10.3	-8.4	-11.4	-9.0	-1.5	-7.4	-8.6	-6.9	-5.9	-5.3
Middle East and Central Asia	-10.8	-12.1	-3.2	6.4	0.7	-10.1	8.7	18.7	9.7	8.2	0.8
Sub-Saharan Africa	-27.0	-17.1	-9.1	-9.0	-13.6	-13.5	-4.1	-7.4	-10.5	-11.1	-10.2
Analytical Groups											
By Source of Export Earnings											
Fuel	-11.5	-8.3	2.7	12.2	4.4	-8.7	12.8	24.0	13.1	11.9	4.6
Nonfuel	0.9	-0.2	-1.0	-3.4	-1.0	3.4	1.9	1.4	-0.5	-0.6	-2.3
Of which, Primary Products	-18.6	-12.5	-14.1	-14.5	-7.1	1.5	2.2	-5.5	-6.6	-4.8	-3.8
By External Financing Source											
Net Debtor Economies	-9.9	-6.9	-6.9	-8.5	-6.2	-2.7	-6.9	-8.3	-6.5	-6.3	-6.6
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2018–22	-24.2	-25.0	-18.0	-13.4	-12.9	-10.4	-8.8	-6.8	-9.7	-11.3	-9.1
<i>Memorandum</i>											
World	0.9	1.2	1.9	1.2	1.5	1.4	3.1	1.3	1.0	1.1	0.2
European Union	6.7	7.2	6.7	6.2	6.0	5.7	7.2	1.9	4.4	4.7	4.8
Middle East and North Africa	-10.1	-11.2	-2.1	8.4	2.3	-9.7	9.9	20.4	11.0	9.5	2.4
Emerging Market and Middle-Income Economies	-0.1	-0.9	0.0	-0.2	0.5	2.6	4.5	6.3	2.3	2.0	-0.8
Low-Income Developing Countries	-15.9	-9.2	-6.2	-8.8	-8.1	-8.2	-10.4	-10.8	-7.7	-7.4	-7.1

¹Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

²See the country-specific notes for Italy and the United Kingdom in the "Country Notes" section of the Statistical Appendix.

Table A11. Advanced Economies: Current Account Balance
(Percent of GDP)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Advanced Economies	0.6	0.8	1.0	0.7	0.7	0.3	0.9	-0.4	0.2	0.3	0.4
United States	-2.2	-2.1	-1.9	-2.1	-2.1	-2.8	-3.6	-3.8	-3.0	-2.8	-2.4
Euro Area ¹	2.7	3.0	3.1	2.8	2.4	1.8	2.8	-0.7	1.2	1.4	1.8
Germany	8.6	8.6	7.8	8.0	8.2	7.1	7.7	4.2	6.0	6.6	6.1
France	-0.4	-0.5	-0.8	-0.8	0.5	-1.6	0.4	-2.0	-1.2	-1.3	-0.4
Italy ²	1.4	2.6	2.7	2.6	3.3	3.9	3.1	-1.2	0.7	0.9	2.1
Spain	2.0	3.2	2.8	1.9	2.1	0.6	0.8	0.6	2.1	2.0	1.8
The Netherlands	5.2	7.1	8.9	9.3	6.9	5.1	12.1	9.2	7.6	7.6	7.3
Belgium	1.4	0.6	0.7	-0.9	0.1	1.1	0.4	-3.6	-2.7	-1.9	-0.3
Ireland	4.4	-4.2	0.5	4.9	-19.9	-6.5	13.7	10.8	7.8	7.2	5.8
Austria	1.7	2.7	1.4	0.9	2.4	3.0	0.4	0.7	0.1	0.0	0.3
Portugal	0.2	1.2	1.3	0.6	0.4	-1.0	-0.8	-1.2	1.3	1.1	0.2
Greece	-1.5	-2.4	-2.6	-3.6	-2.2	-7.3	-7.1	-10.1	-6.9	-6.0	-3.2
Finland	-0.9	-2.0	-0.8	-1.8	-0.3	0.5	0.4	-3.6	-1.7	-0.9	-0.4
Slovak Republic	-2.1	-2.7	-1.9	-2.2	-3.3	0.6	-2.5	-8.2	-2.7	-4.0	-2.1
Croatia	3.3	2.2	3.5	1.8	2.9	-0.5	1.8	-1.6	-0.2	-0.4	0.2
Lithuania	-2.4	-1.1	0.5	0.3	3.5	7.3	1.1	-5.1	0.0	0.9	1.8
Slovenia	3.8	4.8	6.2	5.9	5.9	7.2	3.3	-1.0	4.4	3.8	1.9
Luxembourg	4.8	4.8	4.7	3.7	3.4	3.2	4.6	3.6	3.7	4.0	4.2
Latvia	-0.6	1.6	1.2	-0.2	-0.6	2.9	-3.9	-4.7	-3.0	-2.4	-2.0
Estonia	1.8	1.2	2.3	0.9	2.4	-1.0	-1.8	-2.9	1.8	2.6	1.1
Cyprus	-0.4	-4.2	-5.0	-4.0	-5.6	-10.1	-6.8	-9.1	-8.6	-7.9	-7.6
Malta	2.7	-0.6	5.9	5.6	9.0	2.2	1.2	-5.7	-3.0	-2.9	-0.5
Japan	3.1	4.0	4.1	3.5	3.4	3.0	3.9	2.1	3.3	3.7	3.2
United Kingdom ²	-5.1	-5.5	-3.6	-4.1	-2.8	-3.2	-1.5	-3.8	-3.7	-3.7	-3.5
Korea	7.2	6.5	4.6	4.5	3.6	4.6	4.7	1.8	1.3	1.7	3.1
Canada	-3.5	-3.1	-2.8	-2.4	-2.0	-2.2	-0.3	-0.3	-1.0	-1.0	-2.0
Taiwan Province of China	13.6	13.1	14.1	11.6	10.7	14.4	15.2	13.3	11.8	12.1	10.9
Australia	-4.6	-3.3	-2.6	-2.2	0.4	2.2	3.0	1.1	0.6	-0.7	-0.9
Switzerland	8.9	7.3	5.3	5.6	3.9	0.4	8.6	10.2	8.0	8.0	8.0
Singapore	18.7	17.8	18.1	15.7	16.2	16.5	18.0	19.3	16.6	15.2	11.8
Sweden	3.2	2.2	2.8	2.5	5.3	5.9	6.8	4.8	5.4	5.4	4.0
Hong Kong SAR	3.3	4.0	4.6	3.7	5.9	7.0	11.8	10.6	7.1	6.3	5.2
Czech Republic	0.4	1.8	1.5	0.4	0.3	2.0	-2.8	-6.1	0.5	1.7	2.2
Israel	5.2	3.8	3.7	3.0	3.4	5.4	4.2	3.4	4.2	4.0	3.5
Norway	9.0	5.2	6.3	9.0	3.8	1.1	13.6	30.2	26.2	25.4	17.5
Denmark	8.2	7.8	8.0	7.3	8.5	8.1	9.1	13.5	11.4	9.9	8.9
New Zealand	-2.8	-2.0	-2.8	-4.2	-2.9	-1.0	-6.0	-9.0	-7.9	-6.5	-4.2
Puerto Rico	...	...	...	...	...	...	...	...	...	...	...
Macao SAR	23.3	26.5	30.8	33.0	33.7	14.9	5.8	-23.5	19.9	32.4	35.8
Iceland	5.6	8.1	4.2	4.3	6.5	0.9	-3.0	-2.0	-0.6	-0.4	1.0
Andorra	...	...	...	...	18.0	14.6	16.1	17.0	17.9	18.4	18.9
San Marino	...	...	-0.4	-1.9	2.0	2.8	6.5	8.0	3.8	2.9	1.3
<i>Memorandum</i>											
Major Advanced Economies	-0.5	-0.2	0.0	-0.2	0.0	-0.7	-0.7	-2.1	-1.2	-1.0	-0.8
Euro Area ³	3.4	3.6	3.5	3.4	3.1	2.6	4.1	1.3	2.4	2.6	2.9

¹Data corrected for reporting discrepancies in intra-area transactions.²See the country-specific notes for Italy and the United Kingdom in the "Country Notes" section of the Statistical Appendix.³Data calculated as the sum of the balances of individual euro area countries.

Table A12. Emerging Market and Developing Economies: Current Account Balance
(Percent of GDP)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Emerging and Developing Asia	1.9	1.3	0.9	-0.3	0.5	1.5	1.2	1.2	0.7	0.6	0.0
Bangladesh	1.2	1.6	-0.5	-3.0	-1.3	-1.5	-1.1	-4.1	-0.7	-0.8	-3.0
Bhutan	-27.9	-31.6	-23.6	-18.4	-20.5	-15.8	-12.0	-31.9	-29.4	-12.3	-10.9
Brunei Darussalam	16.7	12.9	16.4	6.9	6.6	4.5	11.2	19.6	10.6	11.6	14.0
Cambodia	-8.7	-8.5	-7.9	-11.8	-10.8	-3.4	-42.0	-27.3	-11.0	-8.0	-6.6
China	2.6	1.7	1.5	0.2	0.7	1.7	2.0	2.2	1.5	1.4	0.7
Fiji	-4.3	-3.5	-6.6	-8.5	-12.8	-13.7	-15.9	-17.3	-10.9	-10.7	-7.9
India	-1.0	-0.6	-1.8	-2.1	-0.9	0.9	-1.2	-2.0	-1.8	-1.8	-2.3
Indonesia	-2.0	-1.8	-1.6	-2.9	-2.7	-0.4	0.3	1.0	-0.3	-0.6	-1.5
Kiribati	33.0	10.8	37.4	38.8	49.5	40.0	8.9	-4.1	9.0	12.2	8.9
Lao P.D.R.	-22.3	-11.0	-11.2	-13.0	-9.1	-5.1	-0.6	-6.0	-2.6	-6.1	-5.7
Malaysia	3.0	2.4	2.8	2.2	3.5	4.2	3.9	3.1	2.7	2.8	3.0
Maldives	-7.5	-23.6	-21.0	-28.4	-26.6	-34.7	-8.5	-16.8	-16.4	-12.8	-9.3
Marshall Islands	11.5	10.0	-0.9	-2.1	-31.3	15.0	22.6	8.2	3.8	-1.1	-13.1
Micronesia	4.5	7.2	10.3	21.0	14.6	0.5	4.0	8.7	1.9	-4.2	-5.6
Mongolia	-8.2	-6.3	-10.1	-16.7	-15.2	-5.1	-13.8	-13.4	-10.9	-12.6	-8.0
Myanmar	-3.5	-4.2	-6.8	-4.7	-2.8	-3.4	-0.3	-4.3	-1.6	-1.5	-1.4
Nauru	-19.6	4.2	12.4	7.6	4.6	2.5	4.6	-0.5	5.8	0.0	-1.1
Nepal	4.4	5.5	-0.3	-7.1	-6.9	-1.0	-7.7	-12.7	-1.5	-4.6	-3.9
Palau	-13.4	-16.2	-22.9	-19.0	-30.8	-47.2	-43.3	-54.7	-57.3	-42.0	-26.9
Papua New Guinea	10.9	13.7	15.9	12.9	14.8	14.1	12.6	27.9	15.9	17.7	9.6
Philippines	2.4	-0.4	-0.7	-2.6	-0.8	3.2	-1.5	-4.5	-3.0	-2.6	-1.1
Samoa	-2.6	-4.2	-1.8	0.8	2.8	0.6	-14.5	-11.3	-3.3	-4.0	-1.2
Solomon Islands	-2.7	-3.5	-4.3	-3.0	-9.5	-1.6	-5.1	-12.1	-11.3	-9.6	-6.4
Sri Lanka ¹	-2.2	-2.0	-2.4	-3.0	-2.1	-1.4	-3.7	-1.0	...	...	...
Thailand	6.9	10.5	9.6	5.6	7.0	4.2	-2.1	-3.0	-0.2	1.9	3.3
Timor-Leste	12.8	-33.0	-17.8	-12.2	6.6	-14.3	1.3	5.0	-42.9	-49.5	-51.9
Tonga	-10.1	-6.5	-6.4	-6.3	-0.8	-5.3	-5.2	-6.3	-7.9	-7.1	-8.2
Tuvalu	-33.7	29.9	2.1	60.9	-22.2	16.3	24.1	4.6	2.2	-1.5	-5.0
Vanuatu	-7.4	-2.4	-6.4	8.7	27.8	7.9	0.8	-4.2	-4.1	-4.5	1.1
Vietnam	-0.9	0.2	-0.6	1.9	3.8	4.3	-2.2	-0.3	0.2	0.7	1.1
Emerging and Developing Europe	1.0	-0.3	-0.7	1.6	1.3	0.1	1.5	2.6	-0.4	-0.3	-0.8
Albania	-8.6	-7.6	-7.5	-6.8	-7.6	-8.7	-7.7	-6.0	-6.0	-5.9	-5.7
Belarus	-3.3	-3.4	-1.7	0.0	-1.9	-0.3	3.2	3.7	2.7	2.0	0.0
Bosnia and Herzegovina	-5.0	-4.7	-4.8	-3.2	-2.6	-3.3	-2.4	-4.5	-4.3	-3.8	-3.6
Bulgaria	0.0	3.1	3.3	0.9	1.9	0.0	-1.9	-0.7	0.0	0.1	-0.3
Hungary	2.3	4.5	2.0	0.2	-0.8	-1.1	-4.1	-8.0	-0.9	-1.6	0.5
Kosovo	-8.8	-8.0	-5.5	-7.6	-5.7	-7.0	-8.7	-10.5	-8.1	-7.4	-5.3
Moldova	-6.0	-3.6	-5.8	-10.8	-9.4	-7.7	-12.4	-14.4	-12.1	-10.9	-9.6
Montenegro	-11.0	-16.2	-16.1	-17.0	-14.3	-26.1	-9.2	-13.2	-10.7	-11.3	-13.7
North Macedonia	-1.8	-2.6	-0.8	0.2	-3.0	-2.9	-3.1	-6.0	-3.3	-3.3	-2.9
Poland	-1.3	-1.0	-1.2	-1.9	-0.2	2.5	-1.4	-3.0	1.0	0.3	-1.0
Romania	-0.8	-1.6	-3.1	-4.6	-4.9	-4.9	-7.2	-9.3	-7.3	-7.1	-6.3
Russia	5.0	1.9	2.0	7.0	3.9	2.4	6.6	10.5	3.4	4.0	2.3
Serbia	-3.5	-2.9	-5.2	-4.8	-6.9	-4.1	-4.3	-6.9	-2.3	-3.2	-4.2
Türkiye ¹	-3.1	-3.1	-4.7	-2.6	1.4	-4.4	-0.9	-5.3	-4.2	-3.0	-2.3
Ukraine ¹	1.7	-1.5	-2.2	-3.3	-2.7	3.3	-1.6	5.0	-5.7	-7.2	-3.8
Latin America and the Caribbean	-3.5	-2.2	-1.8	-2.7	-2.1	-0.4	-2.0	-2.4	-1.8	-1.5	-1.3
Antigua and Barbuda	2.2	-2.5	-8.0	-14.6	-7.2	-16.3	-15.6	-16.2	-12.5	-12.0	-10.2
Argentina	-2.7	-2.7	-4.8	-5.2	-0.8	0.7	1.4	-0.7	-0.6	1.2	1.0
Aruba	3.9	4.6	1.0	-0.5	2.6	-12.4	2.7	11.1	9.5	10.5	7.3
The Bahamas	-12.7	-12.5	-13.5	-9.5	-2.2	-23.4	-21.1	-13.6	-9.5	-8.8	-5.8
Barbados	-6.1	-4.3	-3.8	-4.0	-2.8	-5.9	-11.2	-11.1	-8.5	-7.8	-5.4
Belize	-7.9	-7.2	-6.9	-6.5	-7.6	-6.1	-6.3	-7.3	-6.1	-6.0	-5.5
Bolivia	-5.8	-5.6	-5.0	-4.3	-3.3	0.0	2.1	-0.4	-2.7	-3.3	-3.7
Brazil	-3.5	-1.7	-1.2	-2.9	-3.6	-1.9	-2.8	-2.8	-1.9	-1.8	-2.2
Chile	-2.7	-2.6	-2.8	-4.5	-5.2	-1.9	-7.3	-9.0	-3.5	-3.6	-3.0
Colombia	-6.4	-4.5	-3.2	-4.2	-4.6	-3.5	-5.6	-6.2	-4.9	-4.3	-3.9

Table A12. Emerging Market and Developing Economies: Current Account Balance (continued)
(Percent of GDP)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Latin America and the Caribbean (continued)	-3.5	-2.2	-1.8	-2.7	-2.1	-0.4	-2.0	-2.4	-1.8	-1.5	-1.3
Costa Rica	-3.4	-2.1	-3.6	-3.0	-1.3	-1.0	-2.5	-3.7	-2.8	-2.3	-1.6
Dominica	-4.7	-7.7	-8.9	-43.7	-35.6	-35.4	-27.6	-27.9	-27.1	-19.9	-12.9
Dominican Republic	-1.8	-1.1	-0.2	-1.5	-1.3	-1.7	-2.8	-5.6	-3.7	-3.5	-2.9
Ecuador	-2.2	1.1	-0.2	-1.2	-0.1	2.9	3.2	2.4	1.5	1.6	1.8
El Salvador	-3.2	-2.3	-1.9	-3.3	-0.4	1.6	-4.3	-6.6	-4.5	-4.5	-4.4
Grenada	-10.7	-8.9	-11.6	-12.9	-10.1	-16.4	-13.0	-17.0	-14.8	-12.7	-11.5
Guatemala	-1.2	1.0	1.2	0.9	2.4	5.0	2.2	1.4	2.4	1.8	0.0
Guyana	-3.4	1.5	-4.9	-29.0	-68.8	-16.3	-25.9	23.8	18.0	20.0	47.7
Haiti	-5.1	-1.7	-2.2	-2.9	-1.1	0.4	0.4	-2.3	-2.9	-2.3	-0.4
Honduras	-4.7	-3.1	-1.2	-6.6	-2.6	2.8	-4.7	-3.2	-5.2	-4.9	-3.9
Jamaica	-3.0	-0.3	-2.7	-1.5	-1.9	-1.1	1.0	-0.8	-1.2	-1.7	-2.2
Mexico	-2.7	-2.3	-1.9	-2.1	-0.4	2.0	-0.6	-1.2	-1.5	-1.4	-0.9
Nicaragua	-9.9	-8.5	-7.2	-1.8	5.9	3.6	-3.1	-1.3	2.1	0.2	-1.7
Panama	-8.6	-7.5	-5.8	-7.9	-5.8	-0.3	-3.0	-3.9	-3.6	-3.2	-2.5
Paraguay	-0.2	4.3	3.0	-0.2	0.4	3.6	-0.8	-6.0	0.6	0.1	1.3
Peru	-4.6	-2.2	-0.8	-1.2	-0.6	1.1	-2.2	-4.1	-1.9	-2.1	-1.5
St. Kitts and Nevis	-8.3	-12.3	-10.6	-7.2	-5.8	-10.9	-5.9	-3.4	-2.5	-2.0	-1.0
St. Lucia	-0.7	-6.5	-2.0	1.4	5.5	-15.2	-7.0	-2.3	-0.7	-0.4	-0.1
St. Vincent and the Grenadines	-14.7	-12.9	-11.7	-10.3	-2.3	-15.7	-22.7	-19.5	-17.6	-18.4	-8.9
Suriname	-15.3	-4.8	1.9	-3.0	-11.3	9.0	5.9	2.2	1.5	1.0	-0.5
Trinidad and Tobago	7.8	-3.3	6.0	6.8	4.4	-6.7	11.3	17.9	5.7	7.1	5.9
Uruguay	-0.3	0.8	0.0	-0.5	1.2	-0.8	-2.5	-3.5	-3.7	-3.3	-2.2
Venezuela	-12.8	-3.4	7.5	8.4	5.9	-3.5	-1.2	3.6	2.2	3.4	...
Middle East and Central Asia	-3.9	-4.0	-1.0	2.9	0.4	-3.4	3.3	8.6	4.1	3.6	0.4
Afghanistan ¹	3.7	9.0	7.6	12.2	11.7	11.2	...	...	...	...	...
Algeria	-16.4	-16.5	-13.3	-9.7	-9.9	-12.8	-2.8	9.8	2.9	1.0	-5.2
Armenia	-2.7	-1.0	-1.3	-7.2	-7.1	-4.0	-3.5	0.8	-1.4	-2.3	-5.0
Azerbaijan	-0.4	-3.6	4.1	12.8	9.1	-0.5	15.1	29.8	16.3	15.7	7.0
Bahrain	-2.4	-4.6	-4.1	-6.4	-2.1	-9.4	6.6	15.4	6.6	7.0	2.4
Djibouti	29.5	-1.0	-4.8	14.7	18.3	11.5	2.6	-4.8	-3.2	-1.4	2.3
Egypt	-3.5	-5.6	-5.8	-2.3	-3.4	-2.9	-4.4	-3.5	-1.7	-2.4	-2.7
Georgia	-11.8	-12.5	-8.1	-6.8	-5.9	-12.5	-10.4	-4.0	-6.1	-5.8	-5.5
Iran	0.3	2.9	3.1	7.9	-0.7	-0.4	3.9	4.2	3.4	3.7	2.7
Iraq	-7.0	-7.9	-5.3	3.9	-0.7	-15.0	6.9	17.3	-1.9	-4.3	-7.7
Jordan	-9.0	-9.7	-10.6	-6.8	-1.7	-5.7	-8.2	-8.8	-7.6	-5.4	-3.6
Kazakhstan	-5.4	-5.1	-2.1	-1.0	-3.9	-6.4	-1.3	3.5	-1.5	-0.7	-2.9
Kuwait	3.5	-4.6	8.0	14.4	13.1	4.6	27.2	36.0	30.3	27.7	16.0
Kyrgyz Republic	-15.9	-11.6	-6.2	-12.1	-11.5	4.5	-8.0	-46.5	-20.0	-6.1	-4.2
Lebanon ¹	-19.9	-23.5	-26.4	-28.6	-27.9	-15.7	-17.3	-28.8	...	...	...
Libya	-18.9	-9.4	6.6	14.7	6.7	-8.5	-5.4	32.9	21.3	26.5	14.9
Mauritania	-15.5	-11.0	-10.0	-13.1	-10.3	-6.7	-7.8	-15.3	-9.9	-11.1	-6.7
Morocco	-2.0	-3.8	-3.2	-4.9	-3.4	-1.2	-2.3	-3.5	-3.1	-3.2	-2.8
Oman	-13.9	-16.7	-13.4	-4.6	-4.6	-16.2	-5.4	6.4	5.1	5.4	1.6
Pakistan	-0.9	-1.6	-3.6	-5.4	-4.2	-1.5	-0.8	-4.7	-0.7	-1.8	-1.7
Qatar	8.5	-5.5	4.0	9.1	2.4	-2.1	14.6	26.7	17.6	15.4	9.3
Saudi Arabia	-8.5	-3.6	1.5	8.5	4.6	-3.1	5.1	13.6	5.9	5.4	0.5
Somalia	-2.2	-5.6	1.6	-0.1	-9.0	-4.5	-6.9	-8.2	-9.6	-10.1	-11.1
Sudan ¹	-8.5	-6.5	-9.4	-14.0	-14.2	-16.9	-7.5	-11.2	-1.0	-7.4	-7.7
Syria ²	...	...	...	...	...	...	...	...	...	...	...
Tajikistan	-6.1	-4.2	2.1	-4.9	-2.2	4.1	8.2	15.6	-3.7	-2.4	-3.4
Tunisia	-9.1	-8.8	-9.7	-10.4	-7.8	-5.9	-6.0	-8.6	-5.8	-5.4	-4.6
Turkmenistan	-17.3	-23.1	-11.1	4.9	2.8	2.6	6.5	7.1	3.4	1.8	-2.5
United Arab Emirates	4.7	3.6	7.0	9.7	8.9	6.0	11.5	11.7	8.2	7.7	6.5
Uzbekistan	1.0	0.2	2.4	-6.8	-5.6	-5.0	-7.0	-0.8	-4.3	-4.6	-5.0
West Bank and Gaza ¹	-13.9	-13.9	-13.2	-13.2	-10.4	-12.3	-9.8	...	...	...	...
Yemen	-3.1	-5.8	-2.3	-5.4	-6.1	-17.0	-15.4	-17.8	-19.4	-13.9	-2.0

Table A12. Emerging Market and Developing Economies: Current Account Balance (continued)
(Percent of GDP)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections		
									2023	2024	2028
Sub-Saharan Africa	-5.7	-3.6	-2.1	-2.2	-3.2	-2.7	-1.0	-1.9	-2.7	-2.8	-2.3
Angola	-8.8	-3.1	-0.5	7.3	6.1	1.5	11.2	9.6	3.1	3.7	1.8
Benin	-6.0	-3.0	-4.2	-4.6	-4.0	-1.7	-4.2	-5.6	-6.0	-5.7	-4.2
Botswana	2.2	8.0	5.6	0.4	-6.9	-10.3	-1.3	3.0	0.8	1.5	0.6
Burkina Faso	-7.6	-6.1	-5.0	-4.2	-3.2	4.1	0.4	-6.2	-5.1	-5.2	-3.7
Burundi	-11.5	-11.1	-11.7	-11.4	-11.6	-10.3	-12.4	-15.6	-18.7	-20.7	-12.5
Cabo Verde	-2.9	-3.4	-7.0	-4.8	0.2	-15.0	-11.8	-3.6	-5.8	-5.0	-4.0
Cameroon	-3.6	-3.1	-2.6	-3.5	-4.3	-3.7	-4.0	-1.8	-2.6	-2.4	-3.0
Central African Republic	-9.1	-5.4	-7.8	-8.0	-4.9	-8.2	-11.1	-12.7	-8.8	-7.8	-4.5
Chad	-13.8	-10.4	-7.1	-1.1	-4.2	-7.4	-3.4	6.2	0.2	-3.3	-6.2
Comoros	-0.3	-4.4	-2.2	-3.0	-3.5	-1.9	-0.5	-2.4	-5.6	-5.8	-4.6
Democratic Republic of the Congo	-3.7	-3.9	-3.1	-3.5	-3.2	-2.2	-1.0	-5.2	-6.0	-5.3	-3.0
Republic of Congo	-39.0	-45.3	-5.5	8.3	15.7	12.3	14.2	19.4	4.0	2.1	-2.4
Côte d'Ivoire	-0.4	-0.9	-2.0	-3.9	-2.3	-3.1	-4.0	-6.5	-4.7	-3.8	-2.6
Equatorial Guinea	-17.7	-26.0	-7.8	-2.7	-7.5	-0.8	5.4	9.6	-2.6	-3.0	-7.0
Eritrea ¹	22.4	13.4	24.8	15.5	13.0	...	...	...	...	...	...
Eswatini	13.0	7.9	6.2	1.3	3.9	7.1	2.7	-0.7	6.3	3.2	0.3
Ethiopia	-11.5	-10.9	-8.5	-6.5	-5.3	-4.6	-3.2	-4.3	-2.4	-2.0	-1.9
Gabon	-5.6	-11.1	-8.7	-4.8	-5.0	-6.9	-4.5	1.6	-0.8	-2.1	-6.1
The Gambia	-9.9	-9.2	-7.4	-9.5	-6.2	-3.0	-0.1	-5.9	-5.0	-5.2	-3.8
Ghana	-5.7	-5.1	-3.3	-3.0	-2.2	-2.5	-2.7	-2.1	-2.5	-2.8	-3.1
Guinea	-12.5	-30.7	-6.7	-18.5	-15.5	-16.2	-2.1	-8.2	-8.9	-8.8	-6.6
Guinea-Bissau	1.8	1.4	0.3	-3.5	-8.5	-2.6	-0.8	-9.6	-7.1	-4.5	-4.0
Kenya	-6.3	-5.4	-7.0	-5.4	-5.2	-4.7	-5.2	-5.1	-4.9	-4.9	-5.1
Lesotho	-4.2	-7.8	-4.0	-3.3	-1.5	-1.0	-4.4	-7.9	-3.1	-4.7	-4.3
Liberia	-28.5	-23.0	-22.3	-21.3	-19.6	-16.4	-17.9	-19.6	-22.9	-23.1	-20.4
Madagascar	-1.6	0.5	-0.4	0.7	-2.3	-5.4	-4.9	-5.4	-3.9	-4.8	-4.9
Malawi	-12.2	-13.1	-15.5	-12.0	-12.6	-13.8	-13.3	-3.4	-5.9	-8.5	-6.8
Mali	-5.3	-7.2	-7.3	-4.9	-7.5	-2.2	-7.5	-6.9	-6.5	-5.7	-3.7
Mauritius	-3.5	-3.9	-4.5	-3.8	-5.0	-8.8	-13.0	-11.5	-6.2	-4.1	-5.6
Mozambique	-37.4	-32.2	-19.6	-32.2	-19.1	-27.6	-22.4	-32.9	-16.0	-39.3	-20.5
Namibia	-13.6	-16.5	-4.4	-3.6	-1.8	2.6	-9.9	-12.7	-7.1	-6.4	-4.5
Niger	-15.3	-11.4	-11.4	-12.7	-12.2	-13.2	-14.1	-15.6	-12.5	-3.9	-5.8
Nigeria	-3.1	1.3	3.6	1.7	-3.1	-3.7	-0.7	0.2	0.7	0.6	0.1
Rwanda	-12.7	-15.3	-9.5	-10.1	-11.9	-12.1	-11.2	-9.8	-12.7	-11.3	-7.5
São Tomé and Príncipe	-14.5	-7.2	-15.3	-13.2	-12.7	-11.2	-12.1	-13.3	-14.9	-10.0	-7.0
Senegal	-5.7	-4.2	-7.3	-8.8	-7.9	-10.1	-11.2	-19.9	-14.6	-7.9	-4.4
Seychelles	-17.9	-18.7	-17.9	-2.4	-2.8	-12.3	-10.1	-7.1	-6.9	-8.5	-9.1
Sierra Leone	-23.6	-7.6	-18.3	-17.1	-19.4	-7.9	-8.6	-8.8	-6.8	-7.0	-7.7
South Africa	-4.3	-2.7	-2.4	-2.9	-2.6	1.9	3.7	-0.5	-2.5	-2.8	-2.1
South Sudan	1.7	19.6	9.6	11.0	2.1	-19.2	-9.5	9.8	2.3	2.0	0.4
Tanzania	-7.7	-4.2	-2.6	-3.0	-2.6	-1.9	-3.4	-5.4	-5.1	-4.2	-2.7
Togo	-7.5	-7.2	-1.5	-2.6	-0.8	-0.3	-0.9	-3.2	-3.1	-2.7	-2.2
Uganda	-5.5	-2.6	-4.8	-6.1	-6.6	-9.4	-8.3	-8.2	-7.1	-8.2	-6.4
Zambia	-2.7	-3.3	-1.7	-1.3	0.4	10.6	9.7	3.6	3.8	7.1	8.5
Zimbabwe ¹	-8.0	-3.4	-1.3	-3.7	3.5	2.5	1.0	1.0	0.9	-0.7	-1.1

¹See the country-specific notes for Afghanistan, Eritrea, Lebanon, Sri Lanka, Sudan, Türkiye, Ukraine, West Bank and Gaza, and Zimbabwe in the "Country Notes" section of the Statistical Appendix.

²Data for Syria are excluded for 2011 onward owing to the uncertain political situation.

Table A13. Summary of Financial Account Balances*(Billions of US dollars)*

	2015	2016	2017	2018	2019	2020	2021	2022	Projections	
									2023	2024
Advanced Economies										
Financial Account Balance	273.0	414.4	396.6	445.4	136.6	-35.8	535.1	6.2	71.7	246.8
Direct Investment, Net	-5.9	-252.6	339.0	-50.6	26.3	7.1	711.9	614.4	116.1	163.8
Portfolio Investment, Net	198.3	523.3	11.4	507.7	20.1	189.2	302.3	-833.9	-439.8	-133.2
Financial Derivatives, Net	-90.3	18.6	26.9	48.5	15.4	77.3	37.8	12.4	106.3	101.3
Other Investment, Net	-56.2	-53.3	-228.3	-189.7	6.8	-669.2	-1,153.8	426.8	196.5	-8.0
Change in Reserves	207.6	190.0	247.7	129.5	68.0	358.9	636.1	-213.7	91.9	122.1
United States										
Financial Account Balance	-386.4	-362.4	-373.2	-302.9	-558.4	-668.9	-788.8	-804.8	-905.1	-786.6
Direct Investment, Net	-209.4	-174.6	28.6	-345.4	-201.1	148.3	-99.0	38.2	-87.3	-95.5
Portfolio Investment, Net	-106.8	-193.8	-250.1	78.8	-244.9	-540.2	97.3	-437.7	-428.7	-186.0
Financial Derivatives, Net	-27.0	7.8	24.0	-20.4	-41.7	-5.1	-39.0	-80.7	-22.8	-29.1
Other Investment, Net	-37.0	-4.0	-174.1	-20.8	-75.4	-280.9	-862.0	-330.4	-367.1	-476.0
Change in Reserves	-6.3	2.1	-1.7	5.0	4.7	9.0	114.0	5.8	0.8	0.0
Euro Area										
Financial Account Balance	331.4	310.6	387.9	344.3	234.9	209.1	446.9	90.2	...	...
Direct Investment, Net	240.6	141.5	69.0	137.1	77.1	-247.8	397.3	244.7	...	...
Portfolio Investment, Net	131.4	540.8	404.3	274.8	-138.7	585.6	380.2	-305.9	...	...
Financial Derivatives, Net	126.4	11.3	12.4	46.6	6.5	19.1	68.3	65.9	...	...
Other Investment, Net	-178.5	-400.3	-96.7	-144.0	283.3	-162.9	-553.2	66.6	...	...
Change in Reserves	11.6	17.3	-1.2	29.8	6.7	15.0	154.3	18.9	...	...
Germany										
Financial Account Balance	263.8	286.5	303.0	287.0	224.3	218.5	294.2	240.0	265.6	309.1
Direct Investment, Net	68.4	48.1	37.7	25.1	98.4	-5.6	118.8	132.0	86.6	124.7
Portfolio Investment, Net	213.8	217.9	220.7	177.4	82.9	18.7	240.9	25.6	97.2	136.1
Financial Derivatives, Net	33.7	31.7	12.6	26.8	23.0	107.9	71.2	45.0	57.4	62.5
Other Investment, Net	-49.7	-13.0	33.5	57.2	20.6	97.5	-174.5	32.7	24.5	-14.2
Change in Reserves	-2.5	1.9	-1.4	0.5	-0.6	-0.1	37.7	4.7	0.0	0.0
France										
Financial Account Balance	-0.8	-18.6	-36.1	-28.4	-0.1	-56.5	5.5	-60.8	-25.8	-29.5
Direct Investment, Net	7.9	41.8	11.1	60.2	30.7	10.2	13.8	11.6	23.8	30.7
Portfolio Investment, Net	43.2	0.2	30.3	19.3	-70.4	-29.7	14.9	-125.8	-48.5	-27.8
Financial Derivatives, Net	14.5	-17.6	-1.4	-30.5	4.1	-27.2	21.0	-43.1	-27.0	-17.6
Other Investment, Net	-74.2	-45.4	-72.7	-89.7	32.3	-14.4	-71.2	94.4	22.1	-19.4
Change in Reserves	8.0	2.5	-3.4	12.3	3.2	4.6	27.0	2.0	3.7	4.6
Italy										
Financial Account Balance	42.9	38.1	62.4	40.6	59.2	82.4	65.5	-18.5	34.2	38.8
Direct Investment, Net	2.0	-12.3	0.5	-6.1	1.6	21.5	36.9	-21.8	-10.7	-11.1
Portfolio Investment, Net	111.7	157.8	103.1	157.1	-56.2	132.3	145.7	176.2	-32.5	-33.7
Financial Derivatives, Net	1.3	-3.6	-8.4	-3.3	3.0	-2.8	0.0	12.0	6.4	3.5
Other Investment, Net	-72.7	-102.5	-35.9	-110.2	107.1	-73.1	-141.7	-187.0	70.9	80.1
Change in Reserves	0.6	-1.3	3.0	3.1	3.6	4.6	24.5	2.1	0.0	0.0
Spain										
Financial Account Balance	26.6	37.2	37.6	35.3	28.8	-0.5	16.4	23.2	51.9	52.2
Direct Investment, Net	33.4	12.4	14.1	-19.9	8.9	18.1	-20.1	-0.7	-1.8	-2.0
Portfolio Investment, Net	6.9	62.8	34.7	25.2	-55.8	78.9	31.6	39.7	34.1	39.2
Financial Derivatives, Net	4.2	2.9	8.7	-1.2	-8.0	-8.0	2.2	2.2	0.0	0.0
Other Investment, Net	-23.3	-50.1	-24.0	28.7	82.9	-89.1	-9.4	-22.6	19.5	15.0
Change in Reserves	5.5	9.1	4.1	2.6	0.8	-0.4	12.2	4.7	0.0	0.0

Table A13. Summary of Financial Account Balances (continued)
(Billions of US dollars)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections	
									2023	2024
Japan										
Financial Account Balance	180.9	266.5	168.3	183.9	228.3	132.2	154.0	53.7	138.6	154.4
Direct Investment, Net	133.3	137.5	155.0	134.6	218.9	87.5	175.4	127.7	128.7	133.8
Portfolio Investment, Net	131.5	276.3	-50.6	92.2	87.4	38.5	-198.3	-143.0	-30.9	-36.1
Financial Derivatives, Net	17.7	-16.1	30.4	0.9	3.2	7.8	19.9	38.4	38.4	38.4
Other Investment, Net	-106.7	-125.6	10.0	-67.9	-106.7	-12.4	94.1	78.0	-9.1	6.8
Change in Reserves	5.1	-5.7	23.6	24.0	25.5	10.9	62.8	-47.4	11.5	11.5
United Kingdom										
Financial Account Balance	-160.4	-167.0	-95.8	-123.2	-101.9	-107.4	-24.5	-80.0	-125.4	-134.8
Direct Investment, Net	-106.0	-297.4	46.1	-4.9	-42.2	-136.5	156.1	115.9	6.7	7.2
Portfolio Investment, Net	-192.5	-159.0	-88.3	-352.2	29.8	32.4	-264.3	-108.6	-180.8	-194.6
Financial Derivatives, Net	-133.2	15.6	19.3	10.3	2.5	33.1	-37.4	-58.3	5.8	6.2
Other Investment, Net	239.2	265.0	-81.7	198.7	-90.8	-33.2	96.8	-27.7	42.9	46.4
Change in Reserves	32.2	8.8	8.8	24.8	-1.1	-3.3	24.4	-1.3	0.0	0.0
Canada										
Financial Account Balance	-51.8	-45.4	-44.2	-35.8	-37.9	-36.5	-1.8	-5.8	-21.0	-21.4
Direct Investment, Net	23.6	33.5	53.4	20.4	26.9	15.6	31.3	29.0	4.3	46.5
Portfolio Investment, Net	-36.2	-103.6	-74.9	3.4	-1.6	-67.7	-41.9	-115.9	14.8	16.5
Financial Derivatives, Net	...	...	...	...	...	...	...	...	...	...
Other Investment, Net	-47.8	19.1	-23.5	-58.2	-63.3	14.3	-11.4	70.5	-40.0	-84.4
Change in Reserves	8.6	5.6	0.8	-1.5	0.1	1.3	20.2	10.6	0.0	0.0
Other Advanced Economies¹										
Financial Account Balance	287.9	323.5	308.1	359.6	331.4	386.3	619.9	478.2	553.3	554.6
Direct Investment, Net	-103.1	-76.1	-157.4	43.0	-29.0	68.8	-47.3	-23.6	-132.0	-172.7
Portfolio Investment, Net	321.8	244.9	150.8	367.8	307.8	263.4	485.5	331.3	287.8	289.4
Financial Derivatives, Net	-12.0	3.3	-5.6	31.8	20.0	-10.5	-22.3	29.5	23.7	11.6
Other Investment, Net	-94.7	1.1	107.4	-132.4	2.3	-259.4	-54.1	340.6	305.1	326.8
Change in Reserves	156.2	162.0	213.1	49.5	30.3	323.3	257.1	-199.9	68.0	98.8
Emerging Market and Developing Economies										
Financial Account Balance	-314.1	-436.6	-292.9	-270.1	-163.9	19.2	243.0	489.0	180.4	180.1
Direct Investment, Net	-345.5	-258.7	-309.9	-375.0	-360.8	-328.6	-482.1	-308.8	-255.0	-324.4
Portfolio Investment, Net	125.4	-58.8	-209.7	-103.5	-70.5	-3.7	123.8	484.9	143.8	-1.3
Financial Derivatives, Net	...	...	...	...	...	...	...	...	...	...
Other Investment, Net	468.1	373.1	55.3	96.7	106.0	259.0	67.9	189.4	170.2	234.3
Change in Reserves	-576.9	-487.0	183.2	118.1	161.9	68.9	538.9	131.7	126.7	280.2

Table A13. Summary of Financial Account Balances (continued)*(Billions of US dollars)*

	2015	2016	2017	2018	2019	2020	2021	2022	Projections	
									2023	2024
Regional Groups										
Emerging and Developing Asia										
Financial Account Balance	62.8	-35.9	-67.5	-269.6	-61.7	147.5	152.2	161.7	177.9	163.0
Direct Investment, Net	-139.5	-25.9	-108.3	-170.5	-144.7	-164.2	-258.5	-109.5	-51.3	-87.2
Portfolio Investment, Net	81.6	31.1	-70.1	-100.4	-72.9	-107.4	-20.7	299.5	52.9	-75.0
Financial Derivatives, Net	0.7	-4.6	2.3	4.7	-2.5	15.8	18.8	16.0	16.4	16.9
Other Investment, Net	457.9	354.5	-83.2	-20.6	67.2	239.2	146.6	-78.0	80.0	138.5
Change in Reserves	-333.0	-384.6	199.2	22.1	97.0	167.4	277.3	53.3	91.7	182.7
Emerging and Developing Europe										
Financial Account Balance	68.1	10.9	-25.4	106.2	60.0	8.4	84.6	160.9	-18.7	3.9
Direct Investment, Net	-22.3	-42.8	-27.8	-25.8	-50.3	-38.4	-41.2	-37.2	-29.8	-47.0
Portfolio Investment, Net	54.9	-10.8	-34.9	9.8	-2.8	21.1	40.0	28.6	14.9	17.2
Financial Derivatives, Net	5.1	0.5	-2.2	-3.0	1.4	0.3	-5.9	-5.2	-5.0	-5.0
Other Investment, Net	39.1	28.3	26.0	79.6	19.6	29.5	-36.2	143.9	11.6	22.4
Change in Reserves	-8.7	35.7	13.5	45.6	92.1	-4.1	128.0	31.4	-10.2	16.8
Latin America and the Caribbean										
Financial Account Balance	-197.6	-112.9	-111.6	-163.1	-121.0	-8.7	-103.1	-153.7	-113.5	-103.1
Direct Investment, Net	-133.3	-124.8	-121.2	-148.2	-115.2	-94.6	-102.3	-136.6	-130.5	-125.0
Portfolio Investment, Net	-50.8	-50.5	-39.2	-14.6	1.3	0.9	-6.6	6.6	0.8	-7.3
Financial Derivatives, Net	1.4	-2.9	3.9	4.0	4.9	5.7	2.0	3.2	-4.5	-5.0
Other Investment, Net	13.8	44.2	27.6	-18.1	20.8	63.2	-45.9	-7.8	-16.3	-0.2
Change in Reserves	-28.8	21.0	17.1	13.7	-32.6	16.2	49.7	-19.0	37.1	34.4
Middle East and Central Asia										
Financial Account Balance	-179.0	-232.7	-43.3	96.7	11.8	-105.8	123.8	365.6	179.2	164.7
Direct Investment, Net	-12.4	-31.0	-15.3	-11.0	-21.1	-21.9	-17.6	2.1	-8.8	-22.3
Portfolio Investment, Net	61.7	-11.9	-41.5	6.0	22.6	79.4	69.5	144.5	66.0	56.2
Financial Derivatives, Net	...	...	...	...	...	...	...	...	...	...
Other Investment, Net	-52.0	-44.1	84.7	76.6	9.4	-68.0	18.3	151.9	107.4	90.2
Change in Reserves	-189.9	-154.4	-62.5	31.7	-0.8	-101.7	61.9	71.5	16.4	43.9
Sub-Saharan Africa										
Financial Account Balance	-68.4	-65.9	-45.1	-40.4	-53.0	-22.1	-14.5	-45.5	-44.5	-48.4
Direct Investment, Net	-37.9	-34.2	-37.3	-19.4	-29.5	-9.5	-62.5	-27.5	-34.6	-42.9
Portfolio Investment, Net	-22.0	-16.8	-24.0	-4.4	-18.6	2.4	41.6	5.8	9.0	7.6
Financial Derivatives, Net	-0.4	1.0	0.2	-0.5	0.3	0.7	-0.2	2.0	1.8	1.9
Other Investment, Net	9.2	-9.7	0.1	-20.8	-11.0	-5.1	-14.9	-20.7	-12.5	-16.6
Change in Reserves	-16.4	-4.8	16.0	4.9	6.1	-8.9	22.0	-5.5	-8.4	2.3

Table A13. Summary of Financial Account Balances (continued)
(Billions of US dollars)

	2015	2016	2017	2018	2019	2020	2021	2022	Projections	
									2023	2024
Analytical Groups										
By Source of Export Earnings										
Fuel										
Financial Account Balance	-174.3	-195.3	8.6	167.7	51.0	-71.9	172.9	444.5	226.7	218.4
Direct Investment, Net	-11.5	-20.7	10.9	10.8	-7.9	-8.1	-5.4	28.7	12.4	1.0
Portfolio Investment, Net	66.3	-8.4	-36.2	7.1	20.1	80.8	86.5	115.8	69.2	61.9
Financial Derivatives, Net	...	...	...	...	...	...	...	...	...	...
Other Investment, Net	-17.2	-4.7	111.8	111.7	34.5	-48.3	39.4	213.1	129.0	136.3
Change in Reserves	-225.9	-170.3	-69.7	44.0	2.7	-102.9	59.7	91.5	18.3	23.0
Nonfuel										
Financial Account Balance	-139.8	-241.3	-301.5	-437.8	-214.9	91.1	70.1	44.5	-46.4	-38.3
Direct Investment, Net	-333.9	-238.1	-320.8	-385.8	-352.9	-320.6	-476.7	-337.5	-267.4	-325.4
Portfolio Investment, Net	59.1	-50.4	-173.5	-110.6	-90.7	-84.4	37.3	369.1	74.6	-63.2
Financial Derivatives, Net	6.9	-6.0	4.3	5.2	4.0	22.5	14.7	15.9	8.6	8.8
Other Investment, Net	485.3	377.8	-56.5	-15.1	71.5	307.3	28.4	-23.8	41.2	98.0
Change in Reserves	-350.9	-316.7	252.9	74.1	159.2	171.8	479.3	40.2	108.4	257.2
By External Financing Source										
Net Debtor Economies										
Financial Account Balance	-301.2	-249.2	-308.0	-353.0	-273.5	-78.1	-319.5	-467.4	-364.8	-360.2
Direct Investment, Net	-284.7	-279.0	-264.6	-307.8	-289.7	-227.5	-295.8	-312.0	-302.5	-350.0
Portfolio Investment, Net	-33.7	-62.0	-122.5	-31.8	-27.4	-33.4	-8.6	48.6	-11.7	-25.1
Financial Derivatives, Net	...	...	...	...	...	...	...	6.9	-3.2	-2.2
Other Investment, Net	31.5	24.0	-32.6	-18.7	-66.8	11.6	-224.0	-117.1	-107.6	-100.5
Change in Reserves	-5.9	88.4	115.6	10.3	117.8	167.7	217.0	-74.3	72.0	131.3
Net Debtor Economies by Debt-Servicing Experience										
Economies with Arrears and/or Rescheduling during 2018–22										
Financial Account Balance	-76.0	-80.0	-57.5	-48.2	-44.8	-24.6	-38.4	-31.9	-41.0	-47.0
Direct Investment, Net	-43.1	-35.0	-27.0	-30.1	-32.3	-22.6	-33.2	-23.0	-27.8	-34.5
Portfolio Investment, Net	-1.1	-12.1	-36.7	-19.8	-17.9	5.8	-22.3	27.4	5.0	-1.1
Financial Derivatives, Net	...	...	...	...	...	...	...	...	...	...
Other Investment, Net	-25.6	-34.2	-9.1	-2.3	4.7	11.2	9.8	-14.5	-18.7	-37.9
Change in Reserves	-5.5	1.9	15.9	4.6	0.6	-18.2	8.7	-22.8	-0.4	26.0
Memorandum										
World										
Financial Account Balance	-41.0	-22.2	103.7	175.3	-27.3	-16.6	778.1	495.2	252.1	426.9

Note: The estimates in this table are based on individual countries' national accounts and balance of payments statistics. Country group composites are calculated as the sum of the US dollar values for the relevant individual countries. Some group aggregates for the financial derivatives are not shown because of incomplete data. Projections for the euro area are not available because of data constraints.

¹Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

Table A14. Summary of Net Lending and Borrowing
(Percent of GDP)

	Averages								Projections		
	2005–14	2009–16	2017	2018	2019	2020	2021	2022	2023	2024	Average 2025–28
Advanced Economies											
Net Lending and Borrowing	-0.4	0.3	0.9	0.7	0.7	0.3	1.0	-0.2	0.3	0.4	0.4
Current Account Balance	-0.4	0.3	1.0	0.7	0.7	0.3	0.9	-0.4	0.2	0.3	0.4
Savings	21.8	21.7	23.3	23.4	23.6	23.1	23.8	23.1	22.0	22.0	22.4
Investment	22.1	21.3	22.1	22.4	22.6	22.4	22.7	23.2	22.4	22.2	22.5
Capital Account Balance	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.2	0.1	0.1	0.0
United States											
Net Lending and Borrowing	-3.7	-2.5	-1.8	-2.2	-2.1	-2.9	-3.6	-3.8	-3.0	-2.8	-2.5
Current Account Balance	-3.7	-2.4	-1.9	-2.1	-2.1	-2.8	-3.6	-3.8	-3.0	-2.8	-2.5
Savings	17.2	17.7	19.5	19.6	19.7	19.3	18.0	18.3	16.3	16.4	17.1
Investment	20.7	19.8	20.8	21.2	21.3	21.1	21.1	21.6	20.6	20.4	20.6
Capital Account Balance	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Euro Area											
Net Lending and Borrowing	0.4	1.4	2.9	2.5	2.2	1.8	3.2	0.3	...	...	...
Current Account Balance	0.3	1.3	3.1	2.8	2.4	1.8	2.8	-0.7	1.2	1.4	1.7
Savings	22.7	22.6	24.8	25.3	25.9	25.0	27.1	25.4	25.7	25.9	26.3
Investment	21.6	20.4	21.3	21.9	22.8	22.3	23.0	24.2	23.3	23.3	23.5
Capital Account Balance	0.1	0.1	-0.2	-0.3	-0.2	0.0	0.4	1.1	...	...	...
Germany											
Net Lending and Borrowing	6.2	7.0	7.8	8.0	8.1	6.8	7.7	3.7	6.0	6.6	6.2
Current Account Balance	6.2	7.0	7.8	8.0	8.2	7.1	7.7	4.2	6.0	6.6	6.2
Savings	26.5	27.0	28.8	29.9	30.0	29.0	30.9	29.2	29.8	29.7	30.0
Investment	20.3	20.0	21.0	21.9	21.9	22.0	23.2	25.0	23.8	23.2	23.8
Capital Account Balance	0.0	0.0	-0.1	0.0	-0.1	-0.3	0.0	-0.5	0.0	0.0	0.0
France											
Net Lending and Borrowing	-0.5	-0.7	-0.8	-0.7	0.6	-1.5	0.7	-1.6	-0.8	-0.9	-0.3
Current Account Balance	-0.5	-0.7	-0.8	-0.8	0.5	-1.6	0.4	-2.0	-1.2	-1.3	-0.7
Savings	22.3	21.8	22.7	23.0	24.9	22.5	25.2	24.2	24.4	24.1	23.9
Investment	22.8	22.4	23.4	23.9	24.4	24.1	24.9	26.3	25.6	25.4	24.6
Capital Account Balance	0.0	0.0	0.0	0.1	0.1	0.1	0.4	0.4	0.4	0.4	0.3
Italy¹											
Net Lending and Borrowing	-1.1	-0.1	2.7	2.6	3.2	3.9	3.1	-0.7	1.6	1.7	2.0
Current Account Balance	-1.2	-0.1	2.7	2.6	3.3	3.9	3.1	-1.2	0.7	0.9	1.7
Savings	18.8	18.2	20.7	21.1	21.6	21.6	23.7	20.5	22.1	23.0	24.3
Investment	19.9	18.4	18.1	18.5	18.2	17.7	20.7	21.8	21.4	22.1	22.7
Capital Account Balance	0.1	0.1	0.1	0.0	-0.1	0.1	0.1	0.5	0.9	0.8	0.3
Spain											
Net Lending and Borrowing	-3.7	0.3	3.0	2.4	2.4	1.1	1.6	1.5	3.3	3.1	2.4
Current Account Balance	-4.1	-0.2	2.8	1.9	2.1	0.6	0.8	0.6	2.1	2.0	1.9
Savings	19.7	19.5	22.2	22.3	22.9	21.1	22.4	22.1	22.8	22.9	23.2
Investment	23.9	19.7	19.4	20.5	20.8	20.5	21.6	21.5	20.7	20.9	21.3
Capital Account Balance	0.4	0.4	0.2	0.5	0.3	0.5	0.9	0.9	1.2	1.1	0.5
Japan											
Net Lending and Borrowing	2.5	2.2	4.1	3.5	3.4	2.9	3.9	2.1	3.3	3.6	3.4
Current Account Balance	2.6	2.3	4.1	3.5	3.4	3.0	3.9	2.1	3.3	3.7	3.4
Savings	27.2	26.3	29.3	29.2	29.2	28.3	29.6	28.9	29.7	29.7	29.3
Investment	24.6	24.0	25.2	25.6	25.8	25.3	25.7	26.7	26.4	26.0	25.9
Capital Account Balance	-0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1
United Kingdom¹											
Net Lending and Borrowing	-3.5	-4.0	-3.7	-4.2	-2.9	-3.3	-1.6	-3.9	-3.8	-3.8	-3.7
Current Account Balance	-3.4	-4.0	-3.6	-4.1	-2.8	-3.2	-1.5	-3.8	-3.7	-3.7	-3.6
Savings	13.4	12.5	14.7	13.9	15.3	14.0	16.4	15.8	14.2	13.7	14.1
Investment	16.8	16.5	18.3	18.0	18.1	17.2	17.9	19.6	17.9	17.3	17.7
Capital Account Balance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1

Table A14. Summary of Net Lending and Borrowing (continued)
(Percent of GDP)

	Averages								Projections		
	2005–14	2009–16	2017	2018	2019	2020	2021	2022	2023	2024	Average 2025–28
Canada											
Net Lending and Borrowing	-1.4	-3.1	-2.8	-2.4	-2.0	-2.2	-0.3	-0.3	-1.0	-1.0	-1.6
Current Account Balance	-1.4	-3.1	-2.8	-2.4	-2.0	-2.2	-0.3	-0.3	-1.0	-1.0	-1.6
Savings	22.5	20.8	20.7	21.0	21.1	20.1	23.5	24.2	22.1	21.9	21.4
Investment	23.8	23.9	23.6	23.4	23.0	22.3	23.8	24.5	23.1	22.9	23.0
Capital Account Balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Advanced Economies²											
Net Lending and Borrowing	4.0	4.5	4.7	4.7	4.6	5.3	7.0	7.0	6.2	6.1	5.6
Current Account Balance	4.1	4.6	4.7	4.4	4.7	5.2	7.0	7.0	6.2	6.1	5.5
Savings	30.6	30.5	30.9	30.5	30.3	31.5	33.4	33.4	32.2	32.2	32.0
Investment	26.3	25.7	25.9	25.9	25.5	25.9	26.1	26.0	25.9	26.0	26.4
Capital Account Balance	-0.1	-0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Emerging Market and Developing Economies											
Net Lending and Borrowing	2.2	0.8	-0.1	-0.2	0.0	0.5	1.0	1.5	0.5	0.4	-0.1
Current Account Balance	2.2	0.7	-0.1	-0.2	0.0	0.4	0.9	1.5	0.4	0.4	-0.1
Savings	32.3	32.3	31.7	32.4	32.1	32.9	34.3	34.4	32.4	32.1	31.7
Investment	30.4	31.7	31.8	32.7	32.3	32.5	33.4	33.0	32.0	31.8	31.8
Capital Account Balance	0.2	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0
Regional Groups											
Emerging and Developing Asia											
Net Lending and Borrowing	3.2	1.7	0.9	-0.3	0.5	1.5	1.2	1.2	0.8	0.6	0.2
Current Account Balance	3.1	1.6	0.9	-0.3	0.5	1.5	1.2	1.2	0.7	0.6	0.2
Savings	42.4	42.4	40.1	40.0	39.5	40.2	40.9	40.8	39.4	39.0	38.3
Investment	39.5	40.8	39.2	40.2	39.1	38.7	39.7	39.6	38.7	38.3	38.1
Capital Account Balance	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Emerging and Developing Europe											
Net Lending and Borrowing	-0.5	-0.2	-0.4	2.1	1.7	0.5	1.9	2.8	-0.1	0.1	-0.3
Current Account Balance	-0.6	-0.5	-0.7	1.6	1.3	0.1	1.5	2.6	-0.4	-0.3	-0.6
Savings	23.4	23.2	24.0	25.7	24.3	24.0	26.3	28.1	22.6	21.5	19.8
Investment	23.8	23.6	24.7	23.7	23.0	23.9	24.7	25.4	23.1	21.7	20.4
Capital Account Balance	0.1	0.2	0.3	0.4	0.4	0.5	0.4	0.2	0.3	0.3	0.3
Latin America and the Caribbean											
Net Lending and Borrowing	-1.1	-2.4	-1.8	-2.7	-2.1	-0.2	-2.0	-2.4	-1.7	-1.5	-1.3
Current Account Balance	-1.2	-2.5	-1.8	-2.7	-2.1	-0.4	-2.0	-2.4	-1.8	-1.5	-1.4
Savings	20.6	19.0	17.1	16.5	16.8	17.8	18.4	18.0	18.4	18.7	19.2
Investment	21.8	21.5	18.9	19.2	19.0	18.2	20.5	20.5	20.2	20.3	20.5
Capital Account Balance	0.1	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0
Middle East and Central Asia											
Net Lending and Borrowing	8.8	4.5	-1.3	2.4	0.3	-3.4	3.1	8.3	4.0	3.4	1.4
Current Account Balance	9.0	4.4	-1.0	2.9	0.4	-3.4	3.3	8.6	4.1	3.6	1.5
Savings	36.3	32.0	25.9	28.4	26.9	22.6	28.3	33.1	29.8	29.7	27.9
Investment	27.4	27.3	26.7	25.8	26.6	26.0	25.1	24.8	25.3	25.7	26.1
Capital Account Balance	0.2	0.1	-0.1	-0.2	0.1	-0.1	-0.3	-0.1	0.0	0.0	-0.1
Sub-Saharan Africa											
Net Lending and Borrowing	1.0	-1.9	-1.6	-1.8	-2.8	-2.3	-0.6	-1.7	-2.3	-2.4	-2.2
Current Account Balance	-0.2	-2.6	-2.1	-2.2	-3.2	-2.7	-1.0	-1.9	-2.7	-2.8	-2.5
Savings	20.7	19.1	18.6	19.4	19.8	19.9	21.4	19.7	18.9	19.3	20.8
Investment	21.0	21.5	20.5	21.3	22.9	22.6	22.3	21.5	21.5	22.0	23.2
Capital Account Balance	1.2	0.7	0.4	0.4	0.4	0.4	0.4	0.2	0.4	0.4	0.4

Table A14. Summary of Net Lending and Borrowing (continued)
(Percent of GDP)

	Averages								Projections		
	2005–14	2009–16	2017	2018	2019	2020	2021	2022	2023	2024	Average 2025–28
Analytical Groups											
By Source of Export Earnings											
Fuel											
Net Lending and Borrowing	11.5	5.7	0.8	4.9	1.8	-3.2	5.0	11.3	5.6	5.0	2.7
Current Account Balance	11.7	5.7	1.2	5.5	1.9	-3.2	5.3	11.6	5.8	5.3	3.0
Savings	38.6	33.4	28.0	30.8	29.5	25.3	32.2	36.6	32.2	31.7	29.7
Investment	27.1	27.4	26.4	25.4	27.4	28.5	27.0	25.3	26.1	26.1	26.6
Capital Account Balance	0.1	0.0	-0.2	-0.4	0.0	-0.1	-0.4	-0.2	-0.1	-0.1	-0.1
Nonfuel											
Net Lending and Borrowing	0.7	-0.1	-0.2	-0.8	-0.1	0.9	0.6	0.4	0.0	-0.1	-0.3
Current Account Balance	0.6	-0.2	-0.2	-0.8	-0.2	0.8	0.5	0.4	-0.1	-0.1	-0.4
Savings	31.3	32.1	32.1	32.6	32.4	33.6	34.4	34.1	32.4	32.1	31.9
Investment	30.8	32.3	32.4	33.5	32.7	32.8	34.0	33.8	32.6	32.3	32.3
Capital Account Balance	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
By External Financing Source											
Net Debtor Economies											
Net Lending and Borrowing	-1.8	-2.2	-1.7	-2.3	-1.5	-0.5	-1.9	-2.5	-1.8	-1.7	-1.7
Current Account Balance	-2.1	-2.5	-1.9	-2.5	-1.7	-0.7	-2.1	-2.7	-1.9	-1.9	-1.8
Savings	23.5	23.1	22.9	23.2	23.1	23.4	23.6	23.1	22.8	22.6	22.8
Investment	25.7	25.5	24.8	25.5	24.9	24.1	25.7	25.8	24.8	24.4	24.7
Capital Account Balance	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2018–22											
Net Lending and Borrowing	-2.3	-4.0	-4.4	-3.5	-3.2	-1.9	-2.0	-1.6	-2.4	-2.9	-2.5
Current Account Balance	-3.2	-4.7	-4.9	-3.9	-3.6	-2.5	-2.4	-1.9	-2.7	-3.3	-2.8
Savings	21.3	19.5	18.6	20.0	18.9	17.1	17.7	18.4	17.1	17.9	19.4
Investment	24.7	24.2	24.1	23.8	23.2	20.1	20.5	20.5	20.0	20.9	21.9
Capital Account Balance	0.9	0.7	0.5	0.4	0.4	0.6	0.4	0.3	0.4	0.4	0.3
Memorandum											
World											
Net Lending and Borrowing	0.4	0.4	0.5	0.3	0.4	0.4	1.0	0.5	0.4	0.4	0.2
Current Account Balance	0.4	0.4	0.5	0.4	0.4	0.4	0.9	0.4	0.3	0.3	0.2
Savings	25.3	25.6	26.7	27.0	27.0	27.0	28.1	27.9	26.3	26.2	26.4
Investment	24.9	25.1	25.9	26.5	26.5	26.4	27.1	27.4	26.4	26.2	26.5
Capital Account Balance	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0

Note: The estimates in this table are based on individual countries' national accounts and balance of payments statistics. Country group composites are calculated as the sum of the US dollar values for the relevant individual countries. This differs from the calculations in the April 2005 and earlier issues of the *World Economic Outlook*, in which the composites were weighted by GDP valued at purchasing power parities as a share of total world GDP. The estimates of gross national savings and investment (or gross capital formation) are from individual countries' national accounts statistics. The estimates of the current account balance, the capital account balance, and the financial account balance (or net lending/net borrowing) are from the balance of payments statistics. The link between domestic transactions and transactions with the rest of the world can be expressed as accounting identities. Savings (S) minus investment (I) is equal to the current account balance (CAB) ($S - I = CAB$). Also, net lending/net borrowing (NLB) is the sum of the current account balance and the capital account balance (KAB) ($NLB = CAB + KAB$). In practice, these identities do not hold exactly; imbalances result from imperfections in source data and compilation as well as from asymmetries in group composition due to data availability.

¹See the country-specific notes for Italy and the United Kingdom in the "Country Notes" section of the Statistical Appendix.
²Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

Table A15. Summary of World Medium-Term Baseline Scenario

	Averages				Projections			
	2005–14		2015–24		2021	2022	Averages	
	2005–14	2015–24	2021–24	2025–28				
					<i>Annual Percent Change</i>			
World Real GDP	3.9	3.0	6.3	3.5	3.0	2.9	3.9	3.2
Advanced Economies	1.5	1.7	5.6	2.6	1.5	1.4	2.8	1.8
Emerging Market and Developing Economies	6.0	3.9	6.9	4.1	4.0	4.0	4.7	4.0
<i>Memorandum</i>								
Potential Output								
Major Advanced Economies	1.4	1.2	2.0	1.5	1.6	1.6	1.7	1.6
World Trade, Volume¹	4.7	2.8	10.9	5.1	0.9	3.5	5.0	3.5
Imports								
Advanced Economies	3.2	2.9	10.3	6.7	0.1	3.0	4.9	3.1
Emerging Market and Developing Economies	8.0	2.4	11.8	3.2	1.7	4.4	5.2	4.4
Exports								
Advanced Economies	4.0	2.6	9.8	5.3	1.8	3.1	5.0	3.1
Emerging Market and Developing Economies	6.3	3.1	12.8	4.1	-0.1	4.2	5.2	4.0
Terms of Trade								
Advanced Economies	-0.3	0.3	0.8	-2.0	0.2	0.5	-0.2	0.1
Emerging Market and Developing Economies	1.2	-0.5	0.7	0.9	-1.5	0.2	0.1	-0.3
World Prices in US Dollars								
Manufactures	1.9	0.7	6.6	10.1	-1.8	2.3	4.2	1.8
Oil	9.8	-1.8	65.8	39.2	-16.5	-0.7	17.6	-4.1
Nonfuel Primary Commodities	6.2	1.8	26.7	7.9	-6.3	-2.7	5.7	0.3
Consumer Prices								
Advanced Economies	1.9	2.5	3.1	7.3	4.6	3.0	4.5	2.1
Emerging Market and Developing Economies	6.2	6.1	5.9	9.8	8.5	7.8	8.0	5.5
Interest Rates					<i>Percent</i>			
World Real Long-Term Interest Rate ²	1.2	-0.7	-2.5	-5.0	-1.4	0.6	-2.0	1.3
Current Account Balances					<i>Percent of GDP</i>			
Advanced Economies	-0.4	0.5	0.9	-0.4	0.2	0.3	0.2	0.4
Emerging Market and Developing Economies	2.2	0.3	0.9	1.5	0.4	0.4	0.8	-0.1
Total External Debt								
Emerging Market and Developing Economies	27.1	30.3	31.4	29.2	29.0	28.0	29.4	26.6
Debt Service								
Emerging Market and Developing Economies	9.4	10.8	10.6	10.7	10.4	9.7	10.3	9.4

¹Data refer to trade in goods and services.

²GDP-weighted average of 10-year (or nearest-maturity) government bond rates for Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

WORLD ECONOMIC OUTLOOK SELECTED TOPICS

World Economic Outlook Archives

World Economic Outlook: Hopes, Realities, Risks	April 2013
World Economic Outlook: Transitions and Tensions	October 2013
World Economic Outlook: Recovery Strengthens, Remains Uneven	April 2014
World Economic Outlook: Legacies, Clouds, Uncertainties	October 2014
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Risk Assessment Surrounding the <i>World Economic Outlook</i> Baseline Projections	April 2023, Box 1.3
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IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, SEPTEMBER 2023

The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the Fiscal Monitor, Global Financial Stability Report, and World Economic Outlook on September 26, 2023.

Executive Directors broadly agreed with staff's assessment of the global economic outlook, risks, and policy priorities. They welcomed the continued global economic resilience, particularly of some advanced and emerging market economies, but acknowledged that divergent growth prospects across the world's regions pose a challenge to returning to pre-pandemic output trends. In the case of many emerging market and developing economies (EMDEs), the loss of momentum has reduced prospects for income convergence. Directors recognized that tight monetary policies, necessary to fight inflation, and the withdrawal of fiscal policy support to tackle soaring global debt and support disinflation efforts are also headwinds to growth in the short run. Most Directors agreed that increasing geoeconomic fragmentation is also weighing on the recovery and welcomed the Fund's analysis on the costs of fragmentation. A few Directors emphasized that diversification in supply chains is important to build resilience. More generally, a number of Directors stressed that the Fund's communication on geoeconomic fragmentation should be balanced. Directors generally agreed that ending Russia's war against Ukraine remains the single most impactful action to improve the global outlook.

Directors broadly agreed that risks to the outlook are more balanced relative to April 2023, but remain tilted to the downside. While the acute stress in the banking system seen in March this year has subsided, in part due to swift action in Switzerland and the United States, they broadly noted that financial stability risks remain elevated. In particular, Directors emphasized that persistence in global underlying inflation could warrant higher-for-longer policy rates, which could in turn trigger a correction in financial markets and capital flow volatility. They also considered that commodity prices could see more

volatility due to climate and geopolitical shocks. Most Directors noted the risk of a further deterioration in China's property sector and, in this regard, welcomed the recent policy actions taken by the authorities. Directors also highlighted the risk of further debt distress in those EMDEs heavily reliant on external borrowing and generally indicated that the presence of a weak tail of banks in some major economies also poses vulnerabilities. Directors emphasized that should financial conditions tighten abruptly, adverse feedback loops could be triggered and again test the resilience of the global financial system.

Directors noted that global core inflation remains persistent and declining only slowly, and stressed that monetary policy should maintain a restrictive policy stance, tailored to country circumstances, until inflation declines sustainably to target. They called for clear and transparent communication to avoid a de-anchoring of inflation expectations. Directors also indicated that policies aimed at encouraging labor market participation can help ease labor market tightness in many advanced economies, which would support disinflation.

Directors acknowledged that the fast pace of monetary policy tightening adds further pressure on the financial sector, requiring careful monitoring of risks, better risk assessment and strengthened supervision, and closing supervision gaps in the nonbank financial sector. They called for an assessment of how consistently international standards in banking regulation were implemented during recent financial stresses. Noting vulnerabilities in the commercial real estate sector of some countries, Directors called for continued vigilance and close monitoring.

Directors stressed the need to gradually tighten fiscal policies as deficits and debt remain elevated. They considered that, although the primary responsibility for restoring price stability lies with central banks,

tightening the fiscal stance can further ease inflation by reducing aggregate demand and reinforcing the overall credibility of disinflation strategies. Directors recommended mobilizing revenues through tax capacity building and achieving efficiency gains in spending to help restore some fiscal space, while safeguarding targeted measures to protect the most vulnerable. They also noted that some countries in debt distress may require preemptive and orderly debt restructuring, underscoring the importance of multilateral cooperation in this regard.

Directors expressed concern over the dimming growth prospects for the medium term. In this context, they emphasized the importance of facilitating investment and of targeted and carefully sequenced supply-side reforms, which can enhance productivity growth despite constrained policy space and help dampen inflationary pressures.

Directors called for accelerating decarbonization efforts, while noting that the policy mix will need to strike a balance between climate goals, fiscal sustainability, and political feasibility. They agreed that relying mostly on spending-based measures will be costly and instead favored a combination of revenue, expenditure, and other financing and structural policies to deliver on climate goals. In this context, most Directors agreed that a policy package containing carbon pricing, complemented with measures to address market failures, catalyze private finance and green investment, and mitigate distributional concerns has higher chances to deliver on climate goals and

maintain debt sustainability. Some Directors reiterated, however, that carbon pricing is not an adequate solution in all countries. Directors acknowledged that the green transition will be challenging, particularly for EMDEs with high debt and sizable investment needs; at the same time, delaying the transition will only increase its costs. They generally agreed that incorporating climate change considerations into debt sustainability analyses could improve policy planning, while taking into consideration country-specific characteristics.

Directors underscored that internationally coordinated efforts are indispensable to minimize the cost of decarbonization, especially for low-income countries and small developing states. In this context, they highlighted the important catalytic role that the Resilience and Sustainability Trust could play in attracting green financing and investments. Directors stressed that green industrial policies should avoid distortions to trade and investment flows, in line with the rules of the World Trade Organization (WTO). In this context, a few Directors emphasized that measures such as carbon border adjustment mechanisms should also be WTO-compliant to safeguard international trade. While they considered that, in principle, green and food corridor agreements could help safeguard the energy transition and avert food insecurity, a few Directors underscored the difficulty of implementing these mechanisms. More generally, Directors emphasized that safeguarding the rules-based trading system would be important for global prosperity.

INTERNATIONAL MONETARY FUND

GLOBAL FINANCIAL STABILITY REPORT



INTERNATIONAL MONETARY FUND

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