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WORLD ECONOMIC OUTLOOK

War Sets Back the Global Recovery

2022
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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 February 22, 2022 to March 22, 2022, except for those for the 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 $106.83 a barrel in 2022 and $92.63 a barrel in 2023; that the *three-month government bond yield* for the United States will average 0.9 percent in 2022 and 2.4 percent in 2023, for the euro area will average –0.7 percent in 2022 and 0.0 percent in 2023, and for Japan will average 0.0 percent in 2022 and 0.1 percent in 2023; and that the *10-year government bond yield* for the United States will average 2.6 percent in 2022 and 3.4 percent in 2023, for the euro area will average 0.4 percent in 2022 and 0.6 percent in 2023, and for Japan will average 0.3 percent in 2022 and 0.4 percent in 2023. 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 April 8, 2022.

The following conventions are used throughout the WEO:

- . . . to indicate that data are not available or not applicable;
- – between years or months (for example, 2021–22 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, 2021/22) 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 ¼ 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 2021 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 indicators for each country.

What is new in this publication:

- For Ecuador, fiscal sector projections are excluded from publication for 2022–27 because of ongoing program review discussions.
- Ethiopia's forecast data, which were previously omitted due to an unusually high degree of uncertainty, are now included.
- Fiji's fiscal data and forecasts are now presented on a fiscal year basis.
- For Tunisia, projections are excluded from publication for 2023–27 because of ongoing technical discussions pending potential program negotiations.
- For Ukraine, all projections for 2022–27 except Real GDP are omitted due to an unusually high degree of uncertainty. Real GDP is projected through 2022.

- Venezuela redenominated its currency on October 1, 2021, by replacing 1,000,000 bolívares soberano (VES) with 1 bolívar digital (VED).
- Beginning with the April 2022 WEO, the interest rate assumptions are based on the three-month and 10-year government bond yields, which replace the London interbank offered rates. See the above for more details.

In the tables and figures, the following conventions apply:

- If no source is listed in tables and figures, data are drawn 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.
- The boundaries, colors, denominations, and any other information shown on maps do not imply, on the part of the IMF, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

As used in this report, the terms "country" and "economy" do not in all cases refer to a territorial entity that is a state as understood by international law and practice. As used here, the term also covers some territorial entities that are not states but for which statistical data are maintained on a separate and independent basis.

FURTHER INFORMATION

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The data appearing in the WEO are compiled by the IMF staff at the time of the WEO exercises. The historical data and projections are based on the information gathered by the IMF country desk officers in the context of their missions to IMF member countries and through their ongoing analysis of the evolving situation in each country. Historical data are updated on a continual basis as more information becomes available, and structural breaks in data are often adjusted to produce smooth series with the use of splicing and other techniques. IMF staff estimates continue to serve as proxies for historical series when complete information is unavailable. As a result, WEO data can differ from those in other sources with official data, including the IMF's *International Financial Statistics*.

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World Economic Studies Division
Research Department
International Monetary Fund
700 19th Street, NW
Washington, DC 20431, USA
Fax: (202) 623-6343
Online Forum: www.imf.org/weoforum

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 Malhar Nabar, Division Chief, Research Department. Shekhar Aiyar, Division Chief, Research Department and Head of the Spillovers Task Force, supervised Chapter 4.

The primary contributors to this report are Silvia Albrizio, Jorge Alvarez, Philip Barrett, John Bluedorn, Christian Bogmans, Sonali Das, Niels-Jakob Hansen, Christoffer Koch, Toh Kuan, Ting Lan, Davide Malacrino, Adil Mohommad, Jean-Marc Natal, Diaa Noureldin, Andrea Pescatori, Andrea Presbitero, Ervin Prifti, Galen Sher, Ippei Shibata, Martin Stuermer, Marina Mendes Tavares, Nico Valckx, and Philippe Wingender.

Other contributors include Itai Agur, Cian Allen, Gavin Asdorian, Srijoni Banerjee, Eric Bang, Katharina Bergant, Rachel Brasier, Mariya Brussevich, Diego Cerdeiro, Shan Chen, Yaniv Cohen, Pablo Gonzalez Dominguez, Wenchuan Dong, Angela Espiritu, Siddharth Kothari, Rebecca Eyassu, Francesco Grigoli, Jinjin He, Youyou Huang, Benjamin Hunt, Piyusha Khot, Christina Kolerus, Andras Komaromi, Siddharth Kothari, Eduard Laurito, Jungjin Lee, Daniel Leigh, Andrei Levchenko, Yang Liu, Rui Mano, Susanna Mursula, Yousef F. Nazer, Savannah Newman, Anh Dinh Minh Nguyen, Cynthia Nyanchama Nyakeri, Emory Oakes, Myrto Oikonomou, Chris Papageorgiou, Ilse Peirtsegaele, Clarita Phillips, Carlo Pizzinelli, Josef Platzer, Rafael Portillo, Evgenia Pugacheva, Yiyuan Qi, Max Rozycki, Marika Santoro, Alexandre Sollaci, Philip Stokoe, Nour Tawk, Robin Tietz, Nicholas Tong, Pauline Wibaux, Yarou Xu, Hannah Leheng Yang, Jiaqi Zhao, Canran Zheng, and Bryan Zou.

Joseph Procopio from the Communications Department led the editorial team for the report, with assistance from Lucy Scott Morales, James Unwin, Michael Harrup, Nancy Morrison, Harold Medina, and TalentMEDIA Services.

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 April 11, 2022. 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.

FOREWORD

Global economic prospects have worsened significantly since our last *World Economic Outlook* forecast in January. At the time, we had projected the global recovery to strengthen from the second quarter of this year after a short-lived impact of the Omicron variant. Since then, the outlook has deteriorated, largely because of Russia's invasion of Ukraine—causing a tragic humanitarian crisis in Eastern Europe—and the sanctions aimed at pressuring Russia to end hostilities.

This crisis unfolds while the global economy was on a mending path but had not yet fully recovered from the COVID-19 pandemic, with a significant divergence between the economic recoveries of advanced economies and emerging market and developing ones. In addition to the war, frequent and wider-ranging lockdowns in China—including in key manufacturing hubs—have also slowed activity there and could cause new bottlenecks in global supply chains. Higher, broader, and more persistent price pressures also led to a tightening of monetary policy in many countries. Overall risks to economic prospects have risen sharply and policy trade-offs have become ever more challenging.

Beyond the immediate humanitarian impacts, the war will severely set back the global recovery, slowing growth and increasing inflation even further. This report projects global growth at 3.6 percent in 2022 and 2023—0.8 and 0.2 percentage points lower than in the January forecast, respectively. The downgrade largely reflects the war's direct impacts on Russia and Ukraine and global spillovers.

Both Russia and Ukraine are projected to experience large GDP contractions in 2022. The severe collapse in Ukraine is a direct result of the invasion, destruction of infrastructure, and exodus of its people. In Russia, the sharp decline reflects the impact of the sanctions with a severing of trade ties, greatly impaired domestic financial intermediation, and loss of confidence.

The economic effects of the war are spreading far and wide—like seismic waves that emanate from the epicenter of an earthquake—mainly through commodity markets, trade, and financial linkages. Because Russia is a major supplier of oil, gas, and metals, and, together with Ukraine, of wheat and corn, the current and anticipated decline in the supply of these commodities has already driven their prices up sharply. Europe, Caucasus and Central Asia, Middle East and North Africa, and sub-Saharan Africa are most affected. The food and fuel price increases will hurt lower-income households globally—including in the Americas and Asia.

As Chapter 1 details, the war adds to the series of supply shocks that have struck the global economy over the course of the pandemic, contributing to more shortages beyond the energy and agricultural sectors. Through closely integrated global supply chains, production disruptions in one country can very quickly cascade globally. Firms in Russia and Ukraine supply specialized inputs, and shortfalls in some of those inputs are already having impacts on European car manufacturers. Some countries in eastern Europe and central Asia have large direct trade and remittance links with Russia. Activity in those economies is expected to suffer. The displacement of more than 4 million Ukrainian people to neighboring countries, especially Poland but also Romania, Moldova, and Hungary, will also add to economic pressures in the region.

Even prior to the war, inflation had surged in many economies because of soaring commodity prices and pandemic-induced supply-demand imbalances. Some emerging markets and developed economies' central banks, such as the US Federal Reserve and those in Latin America, had already come under pressure before the war, bringing forward the timing of their monetary policy tightening. War-related supply shortages will greatly amplify those pressures, notably through increases in the price of energy, metals, and food. Although bottlenecks are expected to eventually ease as production elsewhere responds to higher prices and new capacity becomes operational, supply shortages in some sectors are expected to last into 2023. As a result, inflation is now projected to remain elevated for much longer than in our previous forecast, in both advanced and emerging market and developing economies.

In many countries, inflation has become a central concern. In some advanced economies, including the United States and some European countries, it has reached its highest level in more than 40 years, in the context of tight labor markets. There is a rising risk that inflation expectations become de-anchored, prompting a more aggressive tightening response from central banks. In emerging market and developing economies, increases in food and fuel prices could significantly increase the risk of social unrest.

Immediately after the invasion, capital outflows increased markedly from emerging market and developing economies, tightening financial conditions for vulnerable borrowers and net importers of commodities, and putting downward pressure on the currencies of the most exposed countries. So far, this repricing has been mostly orderly. Yet the April 2022 *Global Financial Stability Report* highlights several financial fragility risks. A wider range of emerging market economies could come under pressure if the pace of global monetary tightening accelerates further, especially in the United States, or if financial markets start to reprice more aggressively, which would further weigh on the global outlook.

On the fiscal side, policy space was already eroded in many countries by necessary COVID-related spending. Debt levels have risen significantly, and extraordinary fiscal support was expected to be removed in 2022–23. The war and the impending increase in global interest rates will further reduce fiscal space in many countries, especially oil- and food-importing emerging market and developing economies. The analysis in Chapter 2 shows that non-financial corporate and household leverage increased in many countries during the pandemic, as many governments helped maintain access to credit. Looking ahead, this may create some credit market vulnerabilities as interest rates and risk premia rise, with implications for financial stability.

The war has also increased the risk of a more permanent fragmentation of the world economy into geopolitical blocks with distinct technology standards, cross-border payment systems, and reserve currencies. Such a tectonic shift would entail high adjustment costs and long-run efficiency losses as supply chains and production networks are reconfigured. It also represents a major challenge to the rules-based framework that has governed international and economic relations for the last 70 years.

Because of the unprecedented nature of the shock, we highlight that the uncertainty around these projections is considerable, well-beyond the usual range. Growth could slow significantly more while inflation could turn out higher than expected if, for instance, sanctions aimed at ending the war extend to an even broader volume of Russian energy and other exports. These possibilities are explored in more detail in a Scenario Box in Chapter 1. Moreover, the pandemic is still with us. The continued spread of the virus could give rise to more lethal variants that escape vaccines or immunity from past infections, prompting new lockdowns and production disruptions.

In this difficult and uncertain environment, effective national-level policies and multilateral efforts have an ever more important role in shaping economic outcomes. Central banks will need to adjust their monetary stances even more aggressively should medium- or long-term inflation expectations start drifting from central bank targets or core inflation remains persistently elevated. As advanced economy central banks tighten policy and interest rates rise in those countries, emerging market and developing economies could face a further withdrawal of capital and currency depreciations that increase inflation pressures. Clear central bank communications on the drivers of inflation and forward guidance on the outlook for monetary policy, supplemented—when appropriate—with capital flow management measures in line with the IMF's revised Institutional View on capital flows, will be essential to minimize the risk of disruptive adjustments.

Although several economies will need to consolidate their fiscal balances, this should not impede governments from providing well-targeted support for refugees displaced by conflict, households squeezed by higher food and fuel prices, and those affected by the pandemic, as argued in the April 2022 *Fiscal Monitor*. Social and health spending more broadly should continue to be prioritized. Embedding these fiscal initiatives in a medium-term framework with a clear, credible path for stabilizing public debt can also help create room to deliver the needed support.

Even as policymakers focus on cushioning the impact of the war and the pandemic, attention will need to be maintained on longer-term goals. This includes reskilling workers for the ongoing digital transformation while facilitating the labor market transformation necessary to achieve net zero emissions, as discussed in Chapter 3 of

this report. A comprehensive approach that combines carbon pricing, investment in renewables, and compensation for those adversely affected by the transition can help hasten the needed green transition. Another long-term goal will be to improve the resilience of global supply chains, as discussed in Chapter 4. The analysis in that chapter highlights how reshoring policies could leave economies more exposed to supply disruptions, not less.

Multilateral cooperation remains essential to advance these goals. An immediate priority is to find a peaceful resolution to the war. On the climate front, it is imperative to close the gap between stated ambitions and policy actions. An international carbon price floor differentiated by country income levels and multilateral finance initiatives will be required to coordinate national efforts aimed at reducing the risks of catastrophic climate events. Equally important is the need to secure equitable worldwide access to the full complement of COVID-19 tools—tests, therapies, and vaccines—to contain the virus, and to address other global health priorities.

Policymakers should also ensure that the global financial safety net operates effectively to help vulnerable economies adjust as interest rates rise in the fight against inflation. For some economies, this will mean securing adequate liquidity support to tide over short-term refinancing difficulties. But for other economies, comprehensive sovereign debt restructuring will be required to free up resources for vital health, social, and development spending. The G20's Common Framework for Debt Treatments offers guidance for such restructuring but has yet to deliver. The absence of an effective and expeditious framework is a fault line in the global financial system. Particular attention should also be paid to the overall stability of the global economic order to make sure that the rules-based framework that has lifted hundreds of millions out of poverty is not dismantled.

Importantly, these risks and policies interact in complex ways, at short, medium, and longer horizons. Rising interest rates, the need to protect vulnerable populations against high food and energy prices, or increased defense spending, make it more difficult to maintain fiscal sustainability. In turn, the erosion of fiscal space makes it harder to invest in the climate transition, while delays in dealing with the climate crisis make economies more vulnerable to commodity price shocks, which feeds into inflation and economic instability. Geopolitical fragmentation worsens all these trade-offs by increasing the risk of conflict and economic volatility and decreasing overall efficiency.

In the matter of a few weeks, the world has yet again experienced a major, transformative shock. Just as a durable recovery from the pandemic-induced global economic collapse appeared in sight, the war has created the very real prospect that a large part of the recent gains will be erased. The long list of challenges calls for commensurate and concerted policy actions at the national and multilateral levels to prevent even worse outcomes and improve economic prospects for all.

Pierre-Olivier Gourinchas
Economic Counsellor and Director of Research

EXECUTIVE SUMMARY

The war in Ukraine has triggered a costly humanitarian crisis that demands a peaceful resolution. Economic damage from the conflict will contribute to a significant slowdown in global growth in 2022. A severe double-digit drop in GDP for Ukraine and a large contraction in Russia are more than likely, along with worldwide spillovers through commodity markets, trade, and financial channels. Even as the war reduces growth, it will add to inflation. Fuel and food prices have increased rapidly, with vulnerable populations—particularly in low-income countries—most affected. Elevated inflation will complicate the trade-offs central banks face between containing price pressures and safeguarding growth. Interest rates are expected to rise as central banks tighten policy, exerting pressure on emerging market and developing economies. Moreover, many countries have limited fiscal policy space to cushion the impact of the war on their economies. The invasion has contributed to economic fragmentation as a significant number of countries sever commercial ties with Russia and risks derailing the post-pandemic recovery. It also threatens the rules-based frameworks that have facilitated greater global economic integration and helped lift millions out of poverty. In addition, the conflict adds to the economic strains wrought by the pandemic. Although many parts of the world appear to be moving past the acute phase of the COVID-19 crisis, deaths remain high, especially among the unvaccinated. Moreover, recent lockdowns in key manufacturing and trade hubs in China will likely compound supply disruptions elsewhere.

Global growth is projected to slow from an estimated 6.1 percent in 2021 to 3.6 percent in 2022 and 2023. This is 0.8 and 0.2 percentage points lower for 2022 and 2023 than in the January *World Economic Outlook Update*. Beyond 2023, global growth is forecast to decline to about 3.3 percent over the medium term. Crucially, this forecast assumes that the conflict remains confined to Ukraine, further sanctions on Russia exempt the energy sector (although the impact of European countries' decisions to wean themselves off Russian energy and embargoes announced through March 31, 2022, are factored into the baseline), and the pandemic's health and economic impacts abate over the course of 2022. With a few exceptions, employment and output will typically remain below pre-pandemic trends through 2026. Scarring effects are expected to be much larger in emerging market and developing economies than in advanced economies—reflecting more limited policy support and generally slower vaccination—with output expected to remain below the pre-pandemic trend throughout the forecast horizon. Unusually high uncertainty surrounds this forecast, and downside risks to the global outlook dominate—including from a possible worsening of the war, escalation of sanctions on Russia, a sharper-than-anticipated deceleration in China as a strict zero-COVID strategy is tested by Omicron, and a renewed flare-up of the pandemic should a new, more virulent virus strain emerge. Moreover, the war in Ukraine has increased the probability of wider social tensions because of higher food and energy prices, which would further weigh on the outlook.

Inflation is expected to remain elevated for longer than in the previous forecast, driven by war-induced commodity price increases and broadening price pressures. For 2022, inflation is projected at 5.7 percent in advanced economies and 8.7 percent in emerging market and developing economies—1.8 and 2.8 percentage points higher than projected in January. Although a gradual resolution of supply-demand imbalances and a modest pickup in labor supply are expected in the baseline, easing price inflation eventually, uncertainty again surrounds the forecast. Conditions could significantly deteriorate. Worsening supply-demand imbalances—including those stemming from the war—and further increases in commodity prices could lead to persistently high inflation, rising inflation expectations, and stron-

ger wage growth. If signs emerge that inflation will be high over the medium term, central banks will be forced to react faster than currently anticipated—raising interest rates and exposing debt vulnerabilities, particularly in emerging markets.

The war in Ukraine has exacerbated two difficult policy trade-offs: between tackling inflation and safeguarding the recovery; and between supporting the vulnerable and rebuilding fiscal buffers.

- *Tackling inflation:* Although the drivers of inflation are in many cases beyond the control of central banks (the war, sanctions, the pandemic, supply chain disruptions), price pressures are increasingly broad-based. The transmission of the war shock will vary across countries, depending on trade and financial linkages, exposure to commodity price increases, and the strength of the preexisting inflation surge. The appropriate monetary policy response will therefore differ across economies. In some places, including the United States, inflationary pressure had strengthened considerably and become more broad-based even before the Russian invasion of Ukraine—buoyed by strong policy support. In other countries, the prominence of fuel- and war-affected commodities in local consumption baskets could lead to broader and more persistent price pressures. In both cases, tighter monetary policy will be appropriate to check the cycle of higher prices driving up wages and inflation expectations, and wages and inflation expectations driving up prices. In countries where the harmful effects from the war are larger, the trade-off between safeguarding growth and containing inflation will be more challenging. Central banks should remain vigilant to the impact of price pressures on inflation expectations and continue to communicate clearly on the outlook for inflation and monetary policy. A well-telegraphed, data-dependent approach to adjusting forward guidance on the monetary stance—including the unwinding of record-high central bank balance sheets and the path for policy rates—is the key to maintaining the credibility of policy frameworks.
- *Fiscal policy amid rising interest rates and a cost-of-living squeeze:* Fiscal policies should depend on exposure to the war, the state of the pandemic, and the strength of the recovery. Following a huge and necessary fiscal expansion in many countries during the pandemic, debt levels are at all-time highs and governments are more exposed than ever to higher interest rates. The need for consolidation should not prevent governments from prioritizing spending with well-targeted support for the vulnerable—including refugees, those struggling because of commodity price spikes, and those affected by the pandemic. Where fiscal space permits and when monetary policy is constrained at the national level—for instance by the Effective Lower Bound or in a monetary union—broader fiscal support may be warranted, depending on the severity of the decline in aggregate demand. But this support should be deployed in ways that avoid exacerbating ongoing supply-demand imbalances and price pressures. Where fiscal space is more limited, governments will need to tread a difficult path between fiscal consolidation and prioritizing essential expenditures. Moreover, authorities should be vigilant regarding private sector vulnerabilities to rising interest rates, a topic explored in Chapter 2.
- *Preparing for tomorrow's economy:* Beyond the immediate challenges of the war and the pandemic, policymakers should not lose sight of longer-term goals. Pandemic disruptions have highlighted the productivity of novel ways of working. Governments should look to harness positive structural change wherever possible, embracing the digital transformation and retooling and reskilling workers to meet its challenges. Carbon pricing and fossil fuel subsidy reform can also help with the transition to a cleaner mode of production, less exposed to fossil fuel prices—more important than ever in light of the fallout of the war on the global energy market. The green energy transition will also entail labor market reallocation across occupations and sectors. Chapter 3 examines policies that can facilitate this labor market transformation.

Multilateral efforts to respond to the humanitarian crisis, prevent further economic fragmentation, maintain global liquidity, manage debt distress, tackle climate change, and end the pandemic remain essential. The adverse consequences from the current geopolitical conflict are a reminder of the importance of global cooperation. This extends from addressing the immediate needs of war refugees to the eventual great effort to rebuild Ukraine. As countries contend with higher volatility, spending pressures from humanitarian response needs, and tighter financial market conditions, the

likelihood that some countries will become financially constrained increases. Multilateral institutions offer a critical safety net, providing emergency liquidity and preventing crises from spreading. Where liquidity support alone is insufficient, progress toward orderly debt restructuring is essential. On climate, advanced economies must make real progress toward their COP26 climate summit pledges. Emerging market and developing economies must extend their ambition to reduce emissions. And as the pandemic is not yet over, governments must use all tools at their disposal to combat the virus, both by meeting vaccination targets and by ensuring equitable access to tests and treatment.

CHAPTER 1

GLOBAL PROSPECTS AND POLICIES

War Slows the Recovery

The war in Ukraine has triggered a costly humanitarian crisis that, without a swift and peaceful resolution, could become overwhelming. Global growth is expected to slow significantly in 2022, largely as a consequence of the war. A severe double-digit drop in GDP is expected in Ukraine due to fighting. A deep contraction is projected for Russia due to sanctions and European countries' decisions to scale back energy imports. The economic costs of war are expected to spread farther afield through commodity markets, trade, and—to a lesser extent—financial interlinkages. Fuel and food price rises are already having a global impact, with vulnerable populations—particularly in low-income countries—most affected.

The war in Ukraine will amplify economic forces already shaping the global recovery from the pandemic. The war has further increased commodity prices and intensified supply disruptions, adding to inflation. Even before Russia invaded Ukraine, broad price pressures had led central banks to tighten monetary policy and indicate increasingly hawkish future stances. As a result, interest rates had risen sharply and asset price volatility had increased since the start of 2022—hitting household and corporate balance sheets, consumption, and investment. The prospect of higher borrowing costs has also increased the cost of extended fiscal support. These changes are occurring faster than previously expected even as many parts of the global economy—particularly countries with low vaccination rates—must contend with continued strain on health care systems because of the pandemic.

The war has also added to already high uncertainty about the global outlook. Although many countries appear to be moving past the acute phase of the pandemic, new variants could again lead to waves of infection and further disruption. Inflation pressure could strengthen more than anticipated and demand more aggressive policy responses. Tighter financial conditions will shine a harsh spotlight on debt vulnerabilities among sovereign and corporate borrowers, risking widespread debt distress. Moreover, with continued tight policies toward the real estate sector and the possibility of more widespread lockdowns as part of the strict zero-COVID strategy, China's economy could slow more than currently projected—with consequences for Asia and beyond. This could further set back the recovery, particularly in emerging market and developing economies. More limited policy space could compound scarring effects, particularly in emerging market and developing economies, where medium-term baseline output is expected to be close to 6 percent below pre-pandemic projections.

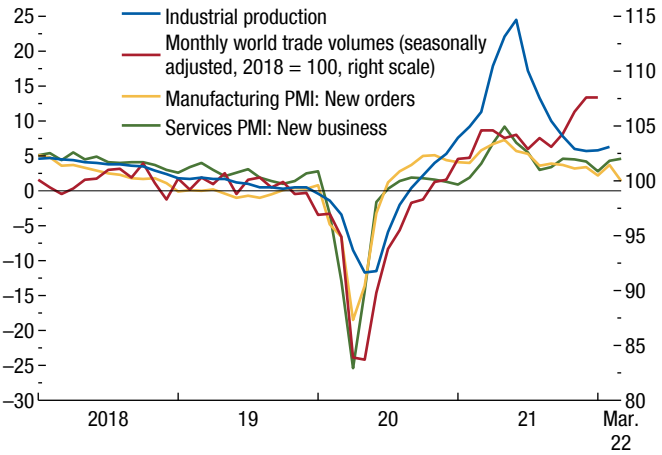
More fundamentally, geopolitical tensions threaten the rules-based frameworks that have governed international economic relations since World War II. Current sanctions imposed with the aim of pressing Russia to end the war are already cutting financial and trade linkages between Russia and other countries, with far-reaching repercussions. Increased global polarization also impedes the cooperation essential for long-term prosperity. This could include derailing the urgent climate change agenda and undermining multilateral efforts to improve debt resolution frameworks, trade integration, and initiatives to avoid future pandemics.

This chapter first discusses the global growth outlook before outlining spillover channels from the war in Ukraine, inflation prospects, and the implications of rising interest rates for emerging market and developing economies. The discussion then turns to the risks to the outlook and policies for improving global prospects.

Fragmentation and Fragility Set to Slow Growth during 2022–23

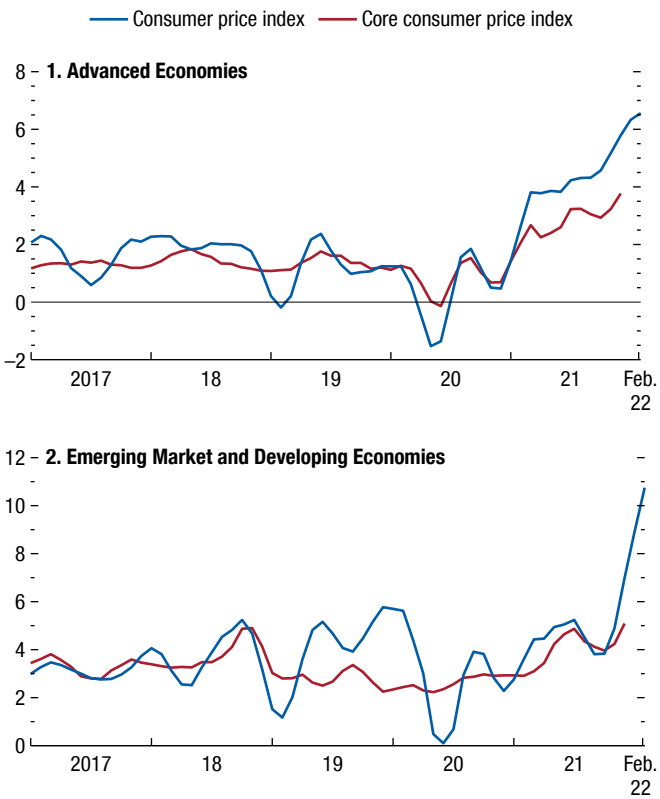
The war in Ukraine has led to extensive loss of life, triggered the biggest refugee crisis in Europe since World War II, and severely set back the global recovery. After a strong recovery in 2021, short-term indicators suggest that global activity has slowed (see Figure 1.1). Global growth is projected to decline from an estimated 6.1 percent in 2021 to 3.6 percent in 2022–23—0.8 and 0.2 percentage points lower for 2022 and 2023 than in the January 2022 *World Economic Outlook*. The ongoing war in Ukraine and sanctions on Russia are expected to reduce global growth in

Figure 1.1. Global Activity Indicators
(Three-month moving average)



Sources: CPB Netherlands Bureau for Economic Policy Analysis; Haver Analytics; Markit Economics; and IMF staff calculations.
Note: Units for industrial production are annualized percent change. For PMIs, units are deviation from 50. PMI above 50 indicates expansion, below 50 indicates contraction. PMI = purchasing managers' index.

Figure 1.2. Inflation Trends
(Three-month moving average; annualized percent change)



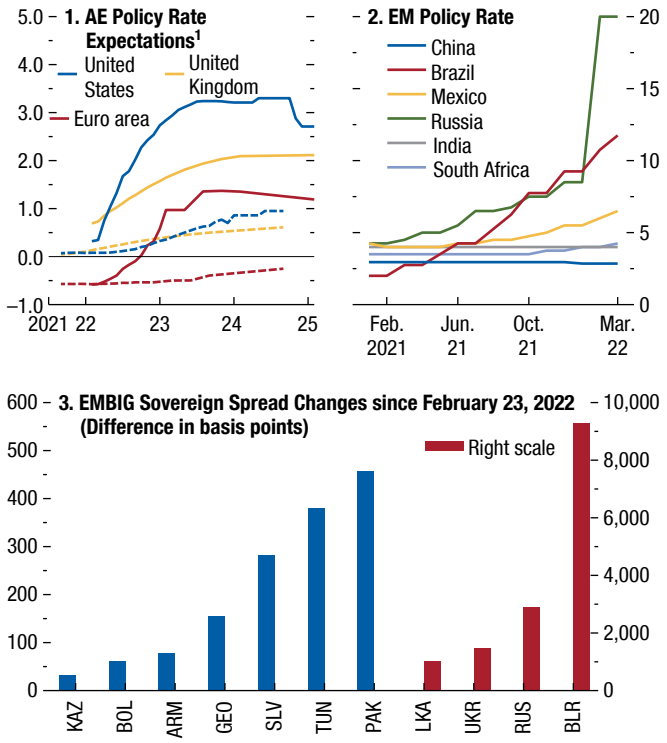
Sources: Haver Analytics; and IMF staff calculations.
Note: Average inflation rates by economy group are purchasing-power-parity GDP-weighted averages. In terms of International Organization for Standardization (ISO) country codes, advanced economies comprise AUT, BEL, CAN, CHE, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, HKG, IRL, ISR, ITA, JPN, KOR, LTU, LUX, LVA, NLD, NOR, PRT, SGP, SVK, SVN, SWE, TWN, USA; emerging market and developing economies comprise BGR, BRA, CHL, CHN, COL, HUN, IDN, IND, MEX, MYS, PER, PHL, POL, ROU, RUS, THA, TUR, ZAF.

2022 through direct impacts on the two countries and global spillovers. This shock comes just as the threat from the Omicron variant appeared to be fading, with many parts of world moving past the acute phase of the pandemic.

Five principal forces shape the near-term global outlook:

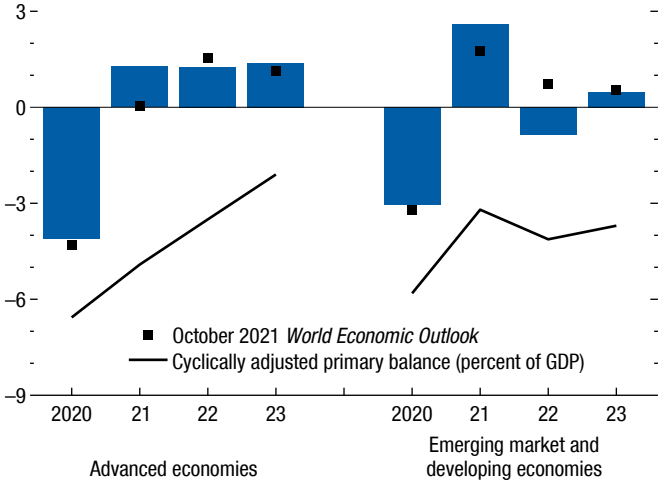
- *War in Ukraine*—The invasion and resulting sanctions on Russia will have important consequences for the global economy. The baseline forecast assumes that the theater of conflict remains limited to Ukraine and that sanctions on Russia (along with European plans to become independent of Russian energy) do not tighten beyond those announced by March 31 and remain in place over the forecast horizon. The effects of conflict and sanctions will hit Ukraine, Russia, and Belarus directly. But international spillovers via global commodity prices, trade and financial linkages, labor supply, and humanitarian impacts will spread the effects more widely—notably in Europe.
- *Monetary tightening and financial market volatility*—Even before the war, inflation had risen significantly (Figure 1.2), and many central banks tightened monetary policy. This contributed to a rapid increase in nominal interest rates across advanced economy sovereign borrowers. In the months ahead, policy rates are generally expected to rise further and record-high central bank balance sheets will begin to unwind, most notably in advanced economies (for more discussion, see the April 2022 *Global Financial Stability Report)*. In emerging market and developing economies, several central banks also tightened policy, adding to those that had already done so in 2021. One exception is China, where inflation remains low and the central bank cut policy rates in January 2022 to support the recovery. Expectations of tighter policy and worries about the war have contributed to financial market volatility and risk repricing (see the April 2022 *Global Financial Stability Report)*. In particular, the war and related sanctions have tightened global financial conditions, lowered risk appetite, and induced flight-to-quality flows. In Russia, the sanctions and the impairment of domestic financial intermediation have led to large increases in its sovereign and credit default swap spreads. Emerging market economies in the region, as well as Caucasus, Central Asia, and North Africa, have also seen their sovereign spreads widen (Figure 1.3).

Figure 1.3. Monetary and Financial Conditions
(Percent, unless noted otherwise)



Sources: Bloomberg Finance L.P.; Refinitiv Datastream; and IMF staff calculations.
Note: Dashed lines in panel 1 are from the October 2021 *World Economic Outlook*. AE = advanced economy; EM = emerging market; EMBIG = emerging markets bond index global. Panel 3 data as of April 8, 2022. Data labels use International Organization for Standardization (ISO) country codes.
[1]Expectations are based on the federal funds rate futures for the United States, the sterling overnight interbank average rate for the United Kingdom, and the euro short-term rate (€STR) forward rates for the euro area, updated April 8, 2022.

Figure 1.4. Fiscal Stance, 2020–23
(Change in structural primary fiscal balance, percent of potential GDP)

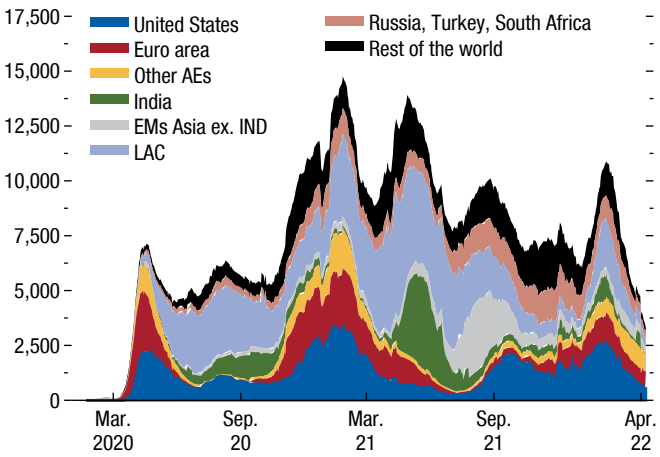


Source: IMF staff estimates.
Note: Cyclically adjusted balance is the general government balance adjusted for the economic cycle. Structural balance is the cyclically adjusted balance corrected for a broader range of noncyclical factors, such as asset and commodity prices. Primary balances shown are obtained by subtracting interest income and adding interest expense to the two series.

Emerging markets capital outflows in early March were as large and fast as those seen early in the pandemic, albeit concentrated among a few economies. Since mid-March, though, the situation has stabilized, with slow-but-steady capital inflows reversing around one quarter of initial losses. Overall, markets have so far differentiated across emerging market securities based on geographic proximity, trade linkages, and commodity exposures to Russia and Ukraine.

- *Fiscal withdrawal*—Policy space in many countries has been eroded by necessary higher COVID-related spending and lower tax revenue in 2020–21. Faced with rising borrowing costs, governments are increasingly challenged by the imperative to rebuild buffers. Fiscal support is set to generally decline in 2022 and 2023—particularly in advanced economies—as emergency measures to cushion the impact of the pandemic are wound down (Figure 1.4; also see the April 2022 *Fiscal Monitor* for more discussion on the evolution of fiscal measures over the acute phase of the pandemic and subsequent recovery).
- *China's slowdown*—Slowing growth in China's economy has wider ramifications for Asia and for commodity exporters. The combination of more transmissible variants and a zero-COVID strategy entail the prospect of more frequent lockdowns, with attendant effects on private consumption in China. Moreover, the continued tight stance toward highly leveraged property developers means that real estate investment remains subdued.
- *Pandemic and vaccine access*—Worker shortages and mobility restrictions compounded supply disruptions and bottlenecks early in 2022, constraining activity and adding to inflation. Restrictions have begun to ease as the peak of the Omicron wave passes and global weekly COVID deaths decline (Figure 1.5). The risk of infection leading to severe illness or death appears lower for the dominant Omicron strain than for others—especially for the vaccinated and boosted. The baseline assumes that the health and economic impacts of the virus start to fade in the second quarter of 2022 and that hospitalizations and deaths are brought to low levels in most countries by the end of the year. A key assumption in the baseline is that the virus does not mutate into new strains requiring further restrictions (see "Risks Are Large and to the Downside" in this chapter). The baseline assumes that

Figure 1.5. New Confirmed COVID-19 Deaths
(Persons, seven-day moving average)



Sources: Our World in Data; and IMF staff calculations.
Note: Data as of April 8, 2022. Economy group and regional classifications are those in the *World Economic Outlook*. Other advanced economies in terms of International Organization for Standardization (ISO) country codes are AUS, CAN, CHE, CZE, DNK, GBR, HKG, ISL, ISR, JPN, KOR, MAC, NOR, NZL, SGP, SMR, SWE, TWN. AEs = advanced economies; EMs Asia ex. IND = emerging Asia excluding India; LAC = Latin American and the Caribbean economies.

most countries will not attain the target of 70 percent full vaccination in 2022. Given vaccination shortfalls in low-income countries, the possibility of renewed outbreaks is factored into the baseline. Yet their impact on activity is assumed to be less than in earlier waves. Adaptation has improved, effective therapeutics are more readily available, and immunity due to previous infection or vaccination has increased. The forecasts are based on information up to 31 March 2022.

Forecast Revisions

Ukraine: Although precise measures of the damage to the Ukrainian economy are impossible to obtain, the war will cause a very severe contraction. For 2022, the Ukrainian economy is expected to contract by 35 percent.[1] And even if the war were to end soon, the loss of life, destruction of physical capital, and flight of citizens will severely impede economic activity for many years to come.

Russia: The tight trade and financial sanctions—including loss of correspondent banking privileges, access of some banks to the SWIFT payments system, and the interdiction of central bank assets—and the oil and gas embargo by some large economies will have a severe impact on the Russian economy. Announced plans by large consumers to wean themselves off Russian energy will also hit in the medium-term. To stave off capital flight, the central bank of Russia has increased the interest rate and broad capital controls have been introduced. Yet financial markets have been turbulent, with the ruble falling close to 60 percent, before returning to near pre-invasion levels in recent weeks, sovereign spreads widening more than 2,500 basis points, and stock markets temporarily suspended. The withdrawal of foreign firms has hobbled many industries, including aviation, finance, software, and agriculture. As a result, the outlook remains bleak. Moreover, financial disintermediation and a loss of investor confidence will lead to a significant drop in private investment and consumption, only partly offset by fiscal spending. The baseline forecast is for a sharp contraction in 2022, with GDP falling by about 8.5 percent, and a further decline of about 2.3 percent in 2023.

Emerging and Developing Europe, including Russia and Ukraine, will see GDP contract by approximately 2.9 percent in 2022, before expanding by 1.3 percent in 2023. The main drivers of the contraction are the impact of higher energy prices on domestic demand and the disruption of trade, especially for Baltic states, whose external demand will decline along with the contraction in Russia's economy. The influx of refugees is expected to place significant immediate pressure on social services, but eventually the increase in the labor force could help medium-term growth and tax revenues.

Advanced Europe: The main channel through which the war in Ukraine and sanctions on Russia affect the euro area economy is rising global energy prices and energy security. Because they are net energy importers, higher global prices represent a negative terms-of-trade shock for most European countries, translating to lower output and higher inflation. Supply chain disruptions have also hurt some industries—including the automobile sector—with the war and sanctions further hindering production of key inputs. As a consequence, euro area GDP growth in 2022 is revised down to 2.8 percent (1.1 percentage points lower than in January), with the biggest downgrades in economies such as Germany and Italy with relatively large manufacturing sectors and greater dependence on energy imports from Russia. Across the euro area, the hit to activity is partially offset by increased fiscal support. In the United Kingdom, GDP growth for 2022 is revised down 1 percentage point—consumption is projected to be weaker than expected as inflation erodes

[1]This is broadly in line with the evidence presented by Novta and Pugacheva (2021) on the most severe conflicts.

real disposable income, while tighter financial conditions are expected to cool investment.

Middle East and North Africa, Caucasus and Central Asia: Countries in the Middle East, North Africa, Caucasus, and Central Asia regions are highly exposed to global food prices, particularly the price of wheat, which is expected to remain high throughout the year and into 2023. In the Middle East and North Africa, spillovers from tighter global financial conditions, reduced tourism, and secondary demand spillovers (for example, from Europe) will also hold back growth, especially for oil importers. For oil exporters, higher fossil fuel prices may provide some offsetting gains. For example, the 2022 forecast for Saudi Arabia is revised up 2.8 percentage points, reflecting higher oil production in line with the OPEC+ (Organization of the Petroleum Exporting Countries, plus Russia and other non-OPEC oil exporters) agreement, reinforced by stronger-than-anticipated growth in the non-oil sector. Countries in the Caucasus and Central Asia (CCA) region have close trade, remittance, and financial linkages to Russia and high exposure to commodity prices, so they will see GDP growth significantly downgraded, with CCA oil importers facing a disproportionate impact. Unresolved social tensions (for example, in Kazakhstan and Sudan) could also act as a drag on investment and growth. Overall, GDP in the Middle East and Central Asia is expected to grow by 4.6 percent in 2022.

Sub-Saharan Africa: In sub-Saharan Africa, food prices are also the most important channel of transmission, although in slightly different ways. Wheat is a less important part of the diet, but food in general is a larger share of consumption. Higher food prices will hurt consumers' purchasing power—particularly among low-income households—and weigh on domestic demand. Social and political turmoil, most notably in West Africa, also weigh on the outlook. The increase in oil prices has however lifted growth prospects for the region's oil exporters, such as Nigeria. Overall, growth in sub-Saharan Africa is projected at 3.8 percent in 2022.

Asia: Developments in China continue to dominate the outlook for Asia, especially for emerging Asia. As noted, the combination of more transmissible variants and the strict zero-COVID strategy in China has led to repeated mobility restrictions and localized lockdowns that, together with an anemic recovery in urban employment, have weighed on private consumption. Recent lockdowns in key manufacturing and trading hubs such as Shenzhen and Shanghai will likely compound supply disruptions elsewhere in the region and beyond. Moreover, real estate investment growth has slowed significantly. External demand is also expected to be weaker in light of the war in Ukraine. While partially offset by more supportive macroeconomic policy, these factors contribute to a 0.4 percentage point forecast downgrade for 2022. For the region more broadly, limited direct trade links to Russia and Ukraine mean that spillover effects will be limited to the commodity price channel and to indirect impacts via weaker demand from key trading partners, such as the euro area. As such, external positions are generally expected to deteriorate—particularly for net oil importers. Notable downgrades to the 2022 forecast include Japan (0.9 percentage point) and India (0.8 percentage point), reflecting in part weaker domestic demand—as higher oil prices are expected to weigh on private consumption and investment—and a drag from lower net exports.

United States and Canada: Economic links between Russia and the United States and Canada are limited. Other factors also have a significant impact on the outlook for the two economies. The forecast for the United States was already downgraded in January, largely reflecting non-passage of the Build Back Better fiscal policy package and continued supply chain disruptions. The additional 0.3 percentage point forecast markdown for 2022 in the current round reflects faster withdrawal of monetary support than in the previous projection—as policy tightens to rein in inflation—and the impact of lower growth in trading partners because of disruptions resulting from the war. The forecast for Canada is marked down 0.2 percentage point, reflecting the withdrawal of policy support and weaker external demand from the United States, which outweigh the lift from favorable terms of trade effects.

Latin America and the Caribbean: With fewer direct connections to Europe, the region is also expected to be more affected by inflation and policy tightening. Brazil has responded to higher inflation by increasing interest rates 975 basis points over the past year, which will weigh on domestic demand. To a lesser extent, this is also the case in Mexico. The downgrades to the forecasts for the United States and China also weigh on the outlook for trading partners in the region. Overall growth for the region is expected to moderate to 2.5 percent during 2022–23.

The fluid international situation means that quantitative forecasts are even more uncertain than usual. Yet some channels through which the war and associated sanctions will affect the global economy seem relatively clear, even if their magnitudes are difficult to assess. The following sections explore these channels in some detail.

Table 1.1. Overview of the *World Economic Outlook* Projections

(Percent change, unless noted otherwise)

		Projections		Difference from January 2022 WEO *Update*[1]		Difference from October 2021 WEO[1]	
	2021	2022	2023	2022	2023	2022	2023
World Output	**6.1**	**3.6**	**3.6**	**–0.8**	**–0.2**	**–1.3**	**0.0**
Advanced Economies	**5.2**	**3.3**	**2.4**	**–0.6**	**–0.2**	**–1.2**	**0.2**
United States	5.7	3.7	2.3	–0.3	–0.3	–1.5	0.1
Euro Area	5.3	2.8	2.3	–1.1	–0.2	–1.5	0.3
Germany	2.8	2.1	2.7	–1.7	0.2	–2.5	1.1
France	7.0	2.9	1.4	–0.6	–0.4	–1.0	–0.4
Italy	6.6	2.3	1.7	–1.5	–0.5	–1.9	0.1
Spain	5.1	4.8	3.3	–1.0	–0.5	–1.6	0.7
Japan	1.6	2.4	2.3	–0.9	0.5	–0.8	0.9
United Kingdom	7.4	3.7	1.2	–1.0	–1.1	–1.3	–0.7
Canada	4.6	3.9	2.8	–0.2	0.0	–1.0	0.2
Other Advanced Economies[2]	5.0	3.1	3.0	–0.5	0.1	–0.6	0.1
Emerging Market and Developing Economies	**6.8**	**3.8**	**4.4**	**–1.0**	**–0.3**	**–1.3**	**–0.2**
Emerging and Developing Asia	7.3	5.4	5.6	–0.5	–0.2	–0.9	–0.1
China	8.1	4.4	5.1	–0.4	–0.1	–1.2	–0.2
India[3]	8.9	8.2	6.9	–0.8	–0.2	–0.3	0.3
ASEAN-5[4]	3.4	5.3	5.9	–0.3	–0.1	–0.5	–0.1
Emerging and Developing Europe	6.7	–2.9	1.3	–6.4	–1.6	–6.5	–1.6
Russia	4.7	–8.5	–2.3	–11.3	–4.4	–11.4	–4.3
Latin America and the Caribbean	6.8	2.5	2.5	0.1	–0.1	–0.5	0.0
Brazil	4.6	0.8	1.4	0.5	–0.2	–0.7	–0.6
Mexico	4.8	2.0	2.5	–0.8	–0.2	–2.0	0.3
Middle East and Central Asia	5.7	4.6	3.7	0.3	0.1	0.5	–0.1
Saudi Arabia	3.2	7.6	3.6	2.8	0.8	2.8	0.8
Sub-Saharan Africa	4.5	3.8	4.0	0.1	0.0	0.0	–0.1
Nigeria	3.6	3.4	3.1	0.7	0.4	0.7	0.5
South Africa	4.9	1.9	1.4	0.0	0.0	–0.3	0.0
Memorandum							
World Growth Based on Market Exchange Rates	5.8	3.5	3.1	–0.7	–0.3	–1.2	0.0
European Union	5.4	2.9	2.5	–1.1	–0.3	–1.5	0.2
Middle East and North Africa	5.8	5.0	3.6	0.6	0.2	0.9	0.1
Emerging Market and Middle-Income Economies	7.0	3.8	4.3	–1.0	–0.3	–1.3	–0.3
Low-Income Developing Countries	4.0	4.6	5.4	–0.7	–0.1	–0.7	–0.1
World Trade Volume (goods and services)	**10.1**	**5.0**	**4.4**	**–1.0**	**–0.5**	**–1.7**	**–0.1**
Imports							
Advanced Economies	9.5	6.1	4.5	–0.2	0.0	–1.2	0.4
Emerging Market and Developing Economies	11.8	3.9	4.8	–1.7	–0.9	–3.2	–0.9
Exports							
Advanced Economies	8.6	5.0	4.7	–1.1	0.0	–1.6	0.7
Emerging Market and Developing Economies	12.3	4.1	3.6	–1.7	–1.5	–1.7	–1.4
Commodity Prices (US dollars)							
Oil[5]	67.3	54.7	–13.3	42.8	–5.5	56.5	–8.3
Nonfuel (average based on world commodity import weights)	26.8	11.4	–2.5	8.3	–0.6	12.3	–1.0
Consumer Prices							
Advanced Economies	3.1	5.7	2.5	1.8	0.4	3.4	0.6
Emerging Market and Developing Economies[6]	5.9	8.7	6.5	2.8	1.8	3.8	2.2

Source: IMF staff estimates.

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during February 7, 2022–March 7, 2022. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. WEO = *World Economic Outlook*.

[1]Difference based on rounded figures for the current, January 2022 WEO *Update*, and October 2021 WEO forecasts.

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

[3]For 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.

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

	Year over Year				Q4 over Q4[8]			
			Projections				Projections	
	2020	2021	2022	2023	2020	2021	2022	2023
World Output	**–3.1**	**6.1**	**3.6**	**3.6**	**–0.3**	**4.6**	**2.5**	**3.5**
Advanced Economies	**–4.5**	**5.2**	**3.3**	**2.4**	**–2.7**	**4.7**	**2.5**	**2.0**
United States	–3.4	5.7	3.7	2.3	–2.3	5.6	2.8	1.7
Euro Area	–6.4	5.3	2.8	2.3	–4.3	4.6	1.8	2.3
Germany	–4.6	2.8	2.1	2.7	–2.9	1.8	2.4	2.5
France	–8.0	7.0	2.9	1.4	–4.3	5.4	0.9	1.5
Italy	–9.0	6.6	2.3	1.7	–6.1	6.2	0.5	2.2
Spain	–10.8	5.1	4.8	3.3	–8.8	5.5	2.3	4.0
Japan	–4.5	1.6	2.4	2.3	–0.8	0.4	3.5	0.8
United Kingdom	–9.3	7.4	3.7	1.2	–6.3	6.6	1.1	1.5
Canada	–5.2	4.6	3.9	2.8	–3.1	3.3	3.5	2.2
Other Advanced Economies[2]	–1.8	5.0	3.1	3.0	–0.4	4.5	2.5	2.8
Emerging Market and Developing Economies	**–2.0**	**6.8**	**3.8**	**4.4**	**1.7**	**4.4**	**2.5**	**4.9**
Emerging and Developing Asia	–0.8	7.3	5.4	5.6	3.7	4.2	4.4	5.8
China	2.2	8.1	4.4	5.1	6.4	3.5	4.8	4.7
India[3]	–6.6	8.9	8.2	6.9	1.5	5.6	2.7	9.0
ASEAN-5[4]	–3.4	3.4	5.3	5.9	–2.5	4.5	5.1	5.3
Emerging and Developing Europe	–1.8	6.7	–2.9	1.3	0.0	6.3	–6.0	3.3
Russia	–2.7	4.7	–8.5	–2.3	–1.7	5.0	–14.1	3.3
Latin America and the Caribbean	–7.0	6.8	2.5	2.5	–3.2	3.8	1.6	2.5
Brazil	–3.9	4.6	0.8	1.4	–1.0	1.6	0.8	1.9
Mexico	–8.2	4.8	2.0	2.5	–4.4	1.1	3.3	1.9
Middle East and Central Asia	–2.9	5.7	4.6	3.7	. . .	. . .	. . .	. . .
Saudi Arabia	–4.1	3.2	7.6	3.6	–3.8	6.7	6.9	3.6
Sub-Saharan Africa	–1.7	4.5	3.8	4.0	. . .	. . .	. . .	. . .
Nigeria	–1.8	3.6	3.4	3.1	–0.2	2.4	2.1	2.3
South Africa	–6.4	4.9	1.9	1.4	–3.4	1.8	2.3	1.1
Memorandum								
World Growth Based on Market Exchange Rates	–3.5	5.8	3.5	3.1	–0.9	4.5	2.6	2.9
European Union	–5.9	5.4	2.9	2.5	–4.1	5.0	1.8	2.7
Middle East and North Africa	–3.3	5.8	5.0	3.6	. . .	. . .	. . .	. . .
Emerging Market and Middle-Income Economies	–2.2	7.0	3.8	4.3	1.8	4.5	2.4	4.9
Low-Income Developing Countries	0.2	4.0	4.6	5.4	. . .	. . .	. . .	. . .
World Trade Volume (goods and services)	**–7.9**	**10.1**	**5.0**	**4.4**	**. . .**	**. . .**	**. . .**	**. . .**
Imports								
Advanced Economies	–8.7	9.5	6.1	4.5	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	–7.9	11.8	3.9	4.8	. . .	. . .	. . .	. . .
Exports								
Advanced Economies	–9.1	8.6	5.0	4.7	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	–4.8	12.3	4.1	3.6	. . .	. . .	. . .	. . .
Commodity Prices (US dollars)								
Oil[5]	–32.7	67.3	54.7	–13.3	–27.6	79.2	28.6	–11.6
Nonfuel (average based on world commodity import weights)	6.8	26.8	11.4	–2.5	15.4	17.3	9.4	–2.5
Consumer Prices								
Advanced Economies[6]	0.7	3.1	5.7	2.5	0.4	4.9	4.8	2.2
Emerging Market and Developing Economies[7]	5.2	5.9	8.7	6.5	3.3	6.0	8.8	5.3

[4]Indonesia, Malaysia, Philippines, Thailand, Vietnam.

[5]Simple 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 $69.07 in 2021; the assumed price, based on futures markets, is $106.83 in 2022 and $92.63 in 2023.

[6]The inflation rates for 2022 and 2023, respectively, are as follows: 5.3 percent and 2.3 percent for the euro area, 1.0 percent and 0.8 percent for Japan, and 7.7 percent and 2.9 percent for the United States.

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

[8]For 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 80 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)

		Projections		Difference from January 2022 WEO *Update*[1]		Difference from October 2021 WEO[1]	
	2021	2022	2023	2022	2023	2022	2023
World Output	**5.8**	**3.5**	**3.1**	**–0.7**	**–0.3**	**–1.2**	**0.0**
Advanced Economies	**5.1**	**3.3**	**2.3**	**–0.6**	**–0.2**	**–1.2**	**0.2**
Emerging Market and Developing Economies	**6.8**	**3.8**	**4.2**	**–0.8**	**–0.3**	**–1.2**	**–0.3**
Emerging and Developing Asia	7.4	5.0	5.4	–0.5	–0.2	–1.0	–0.1
Emerging and Developing Europe	6.4	–2.1	0.8	–5.6	–2.1	–5.8	–2.1
Latin America and the Caribbean	6.6	2.4	2.4	0.2	–0.1	–0.6	–0.1
Middle East and Central Asia	5.1	4.6	3.4	0.5	0.2	0.7	0.0
Sub-Saharan Africa	4.5	3.8	3.9	0.2	0.1	0.1	0.0
Memorandum							
European Union	5.3	2.8	2.4	–1.1	–0.2	–1.5	0.2
Middle East and North Africa	5.0	4.8	3.2	0.7	0.2	0.9	0.1
Emerging Market and Middle-Income Economies	7.0	3.7	4.2	–0.8	–0.3	–1.3	–0.3
Low-Income Developing Countries	4.0	4.6	5.3	–0.6	–0.1	–0.6	–0.1

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*.
[1]Difference based on rounded figures for the current, January 2022 WEO *Update*, and October 2021 WEO forecasts.

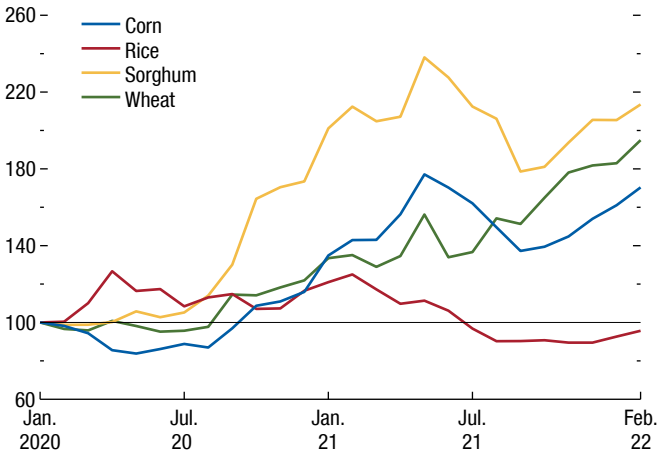
International Implications of the War in Ukraine

The ongoing war in Ukraine and sanctions on Russia are expected to generate substantial economic spillovers, principally through five channels.

Global commodity markets: War-related interruptions to production, sanctions, and strongly impaired access to cross-border payment systems will disrupt trade flows, notably for energy and food. The magnitude of these changes depends not only on the decline in exports as a result of the conflict and sanctions, but also on the elasticity of global supply and demand. Although the price of oil has risen sharply, spare capacity in other countries and the release of petroleum reserves will likely mean that these increases will be contained over the medium term. In contrast, the relatively inflexible infrastructure needed to transport gas (pipelines are more important for gas than for oil, for example) means that global supply can adjust less easily, raising the prospect of higher prices for longer. Prices of agricultural commodities are likely to rise further—particularly wheat (together, Russia and Ukraine account for close to 30 percent of global wheat exports) and, to a lesser extent, corn. These changes will add to already soaring prices of staple foods (Figure 1.6) and mean that disruptions to Russian exports may be windfalls for other commodity exporters.

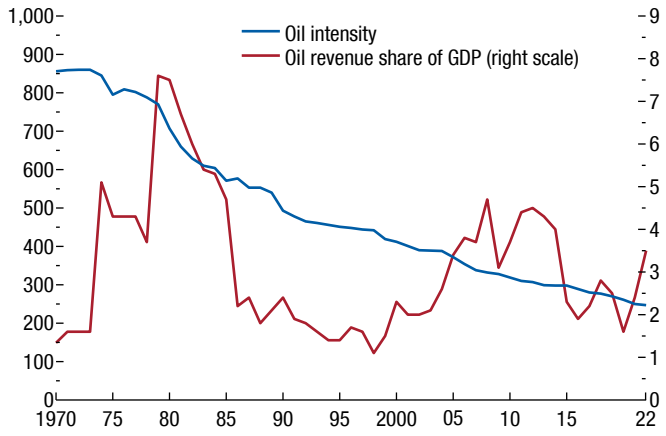
The sharp increases in commodity prices echo those in the 1970s, when a regional conflict also prompted a spike in fossil fuel prices. At that time, several years of high inflation and low growth followed. The experience of that period has raised the specter of "stagflation" in the current situation—commonly defined as a period of low growth (stagnation) and high inflation. Now, however, circumstances differ in important ways (Figure 1.7). The size of the oil price shock is smaller so far, and today's economy is less reliant on oil (between August 1973 and January 1974, the

Figure 1.6. International Cereal Prices
(US dollars, index, January 2020 = 100)



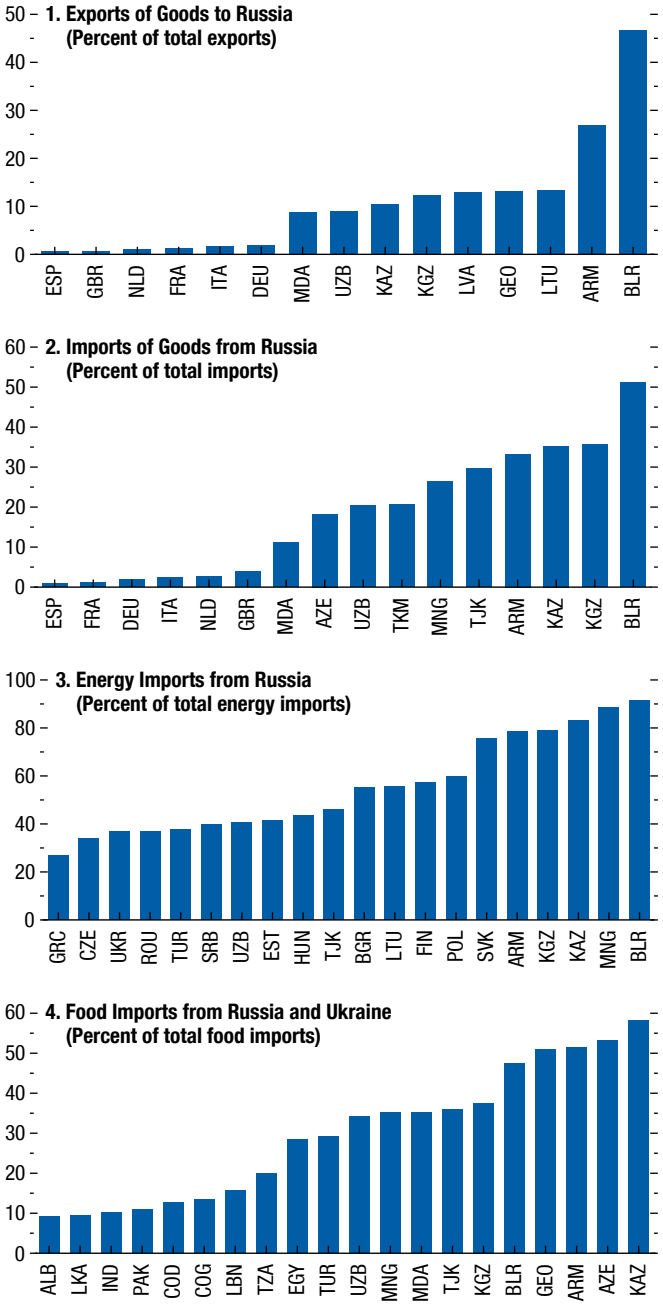
Sources: IMF, Primary Commodity Price System; and IMF staff calculations.

Figure 1.7. Global Oil Intensity and Oil Revenue Share
(Barrels, percent on right scale)



Source: IMF staff calculations.
Note: Oil intensity is defined as barrels of oil needed to produce $1 million in real GDP. Real GDP is based on constant 2017 purchasing-power-parity international dollars.

Figure 1.8. Trade Exposures to Russia and Ukraine, 2020

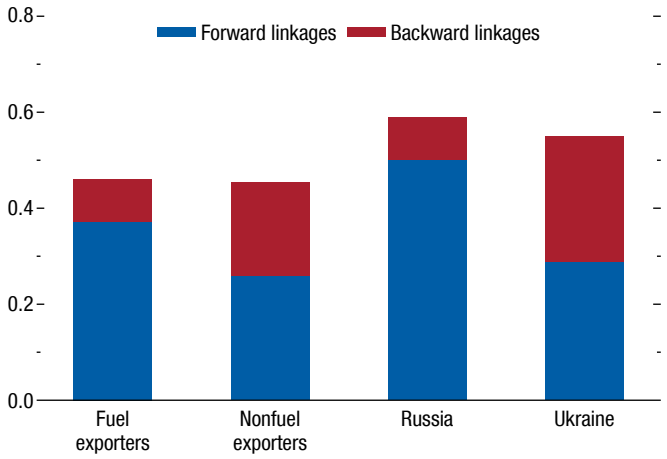


Sources: Direction of Trade Statistics; United Nations, Comtrade database; and IMF staff calculations.
Note: Energy includes crude petroleum, refined petroleum, petroleum gas, and coal. Data labels use International Organization for Standardization (ISO) country codes.

oil price almost tripled, from about $20 to $60, in 2021 dollars, and remained high; moreover, the global economy's oil intensity was about 3.5 times greater than today). Wage setting mechanisms are different as well, with generally lower prevalence of indexation. The conduct of monetary policy has also changed since the 1970s. More central banks are independent today and monetary policy credibility has generally strengthened over the decades. As discussed below, medium-term inflation expectations remain reasonably well-anchored at central bank targets in most countries. Moreover, despite the significant downward revision to global growth, the baseline forecast is for output to expand close to its pre-pandemic average of 3.5 percent. Nonetheless, as discussed in the risks section below, growth could slow further than forecast in the baseline, and inflation could turn out higher than expected. This may be particularly salient for parts of Europe, given their relatively higher reliance on Russian gas imports.

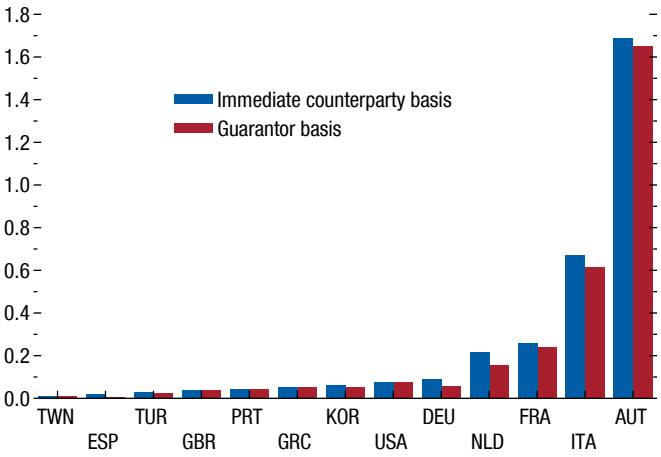
Direct trade and remittances linkages with Russia and Ukraine: Although the broadest global spillovers are likely through commodity prices, direct trade linkages add a further layer of disruptions. These will depend on countries' trade balances with Russia and Ukraine. Countries that send a large share of exports to Russia, such as Belarus, some Baltic states, and Caucasus countries, will suffer reduced external demand for their products (Figure 1.8). Importers will face higher import prices and possible shortages. The effects are likely to be concentrated in specific markets, such as metals and minerals, noble gases, and agricultural exports, especially wheat. Some countries, particularly

Figure 1.9. Global Value Chain Participation, 2018
(Share of exports)



Sources: Eora Global Value Chain Database; and IMF staff calculations.
Note: Global value chain participation is the sum of backward and forward linkages. The former measure imported intermediate inputs that are used to generate output for exports. The latter measure exports of intermediate goods that are used as inputs for the production of exports of other countries. See Casella and others (2019) for methodological details.

Figure 1.10. Ratio of Banks' Exposure to Russia to Total Assets, end-September 2021
(Percent)



Sources: Bank for International Settlements, Consolidated Banking Statistics; and IMF staff calculations.
Note: For immediate counterparty basis, claims are allocated to the country and sector of the entity to which the funds were lent. For guarantor basis, claims are allocated to the country and sector of the entity that guarantees the claims (in the case of claims on branches, the country of the parent bank). Countries with immediate counterparty basis number higher than 0.0085 percent are shown. Data labels use International Organization for Standardization (ISO) country codes.

in the Caucasus and Central Asia region, will also see remittances from Russia decline.

Propagation through cross-border production networks: The integration of Russia and Ukraine into global value chains extends beyond typical commodity linkages (Figure 1.9). Disruptions in upstream sectors can therefore cascade beyond bilateral trading partners. For instance, production of neon gas—an input in the manufacture of silicon chips—is concentrated in Russia and Ukraine. This will be interrupted, compounding silicon chip shortages, which have already caused production bottlenecks further downstream in automobiles and electronics. Global car production is also affected by the war in other ways: disruptions to Ukraine's production of electronic wiring systems have already contributed to automobile plant shutdowns in Germany. Protracted shortages of metals exported from Russia, such as palladium and nickel, will increase the cost of items including catalytic converters and batteries. And disruptions of exports of potash fertilizers from Belarus will affect food production elsewhere and exacerbate food price increases. In the near term, there is limited scope for downstream producers to substitute alternative inputs. The initial shock in Ukraine, Russia, and Belarus can therefore quickly amplify across sectors and borders, magnifying the impact of the war on global activity. In particular, supply disruptions can have a wider impact by reducing demand in other sectors if affected firms reduce orders for complementary inputs from other suppliers. Finally, reputational risks and investor and customer disapproval may cause firms to avoid commercial transactions with Russian counterparts, even in sectors not directly affected by sanctions—further severing cross-border production ties.

Financial markets: Sanctions have induced direct financial stress on firms with outstanding payments for recent shipments or financial assets abroad. Beyond this, sanctions have also added operational challenges to market functioning and increased volatility. Counterparty risk and the risk of sovereign default have increased. However, direct financial connections between Russia and other major economies appear relatively small and concentrated in just a few countries, mostly in Europe. Of these, Austrian and Italian banks are most exposed to Russian counterparties (see Figure 1.10). European bank exposures to Russia appear manageable also because a large share of European banks' direct exposure is through their locally funded Russian subsidiaries. More generally, a wider increase in geopolitical uncertainty could prompt a more severe repricing of risk by investors. This would likely affect emerging market and developing economies, especially those with

large external debt. Additional complications, such as the removal of Russian assets from global equity and bond indices, and—critically—high volatility and disruptions in commodity markets point to longer-term challenges for financial markets, including increased fragmentation.

Humanitarian impact: A very large number of refugees have fled the war already, and many more may follow. The UNHCR, the UN Refugee Agency, reports that over 4.5 million refugees have left Ukraine since February 24: half have arrived in Poland, and many more are expected to flee. In the short term, refugee arrivals will strain local services, including for shelter and health care. In the longer term, the dispersion of a large number of refugees across the European Union will have important social and economic effects, increasing labor supply but potentially exacerbating anti-immigrant sentiment.

Policy responses: The international economic transmission of the war and sanctions will also depend on policies in countries not directly involved. Decisions to increase oil and gas supply or release energy reserves could alleviate price pressures. Expanded fiscal support in Europe could help compensate for shrinking demand (see Box 1.2 in the April 2022 *Fiscal Monitor*). Moreover, the response of central banks, particularly those in large advanced economies, will also shape the economic impact of the war. Many will have to weigh rising inflation (due to higher international commodity prices and supply disruptions) against weakening activity (due to lower trade and heightened uncertainty).

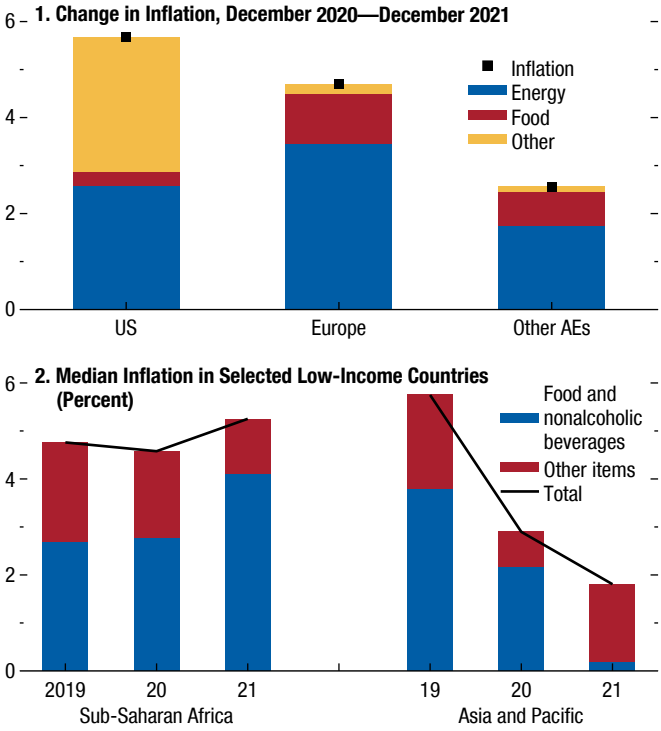
Elevated Inflation Expected to Persist for Longer

Inflation forecast: With the impact of the war in Ukraine and broadening of price pressures, inflation is expected to remain elevated for longer than in the previous forecast. The conflict is likely to have a protracted impact on commodity prices, affecting oil and gas prices more severely in 2022 and food prices well into 2023 (because of the lagged impact from the harvest in 2022). For 2022, inflation is projected at 5.7 percent in advanced economies and 8.7 percent in emerging market and developing economies—1.8 and 2.8 percentage points higher than in the January *World Economic Outlook*. Inflation in 2023 is projected at 2.5 percent for the advanced economy group and 6.5 percent for emerging market and developing economies (0.4 and 1.8 percentage points higher than in the January forecast). However, as with the growth outlook, considerable uncertainty surrounds these inflation projections.

The main factors shaping the baseline inflation outlook are the following.

The war in Ukraine has aggravated spikes in commodity prices. Energy and food prices were a major contributing factor to headline inflation in 2021, to varying degrees across regions (Figure 1.11). The sharp spike in oil and gas prices—reflecting tight fossil fuel supply after years of subdued investment (see the Commodities Special Feature in this chapter) and geopolitical uncertainty—led to a significant increase in energy costs. These increases were the main driver of headline inflation in Europe and to a lesser extent the United

Figure 1.11. Changes in Inflation Drivers
(Percentage points, unless noted otherwise)

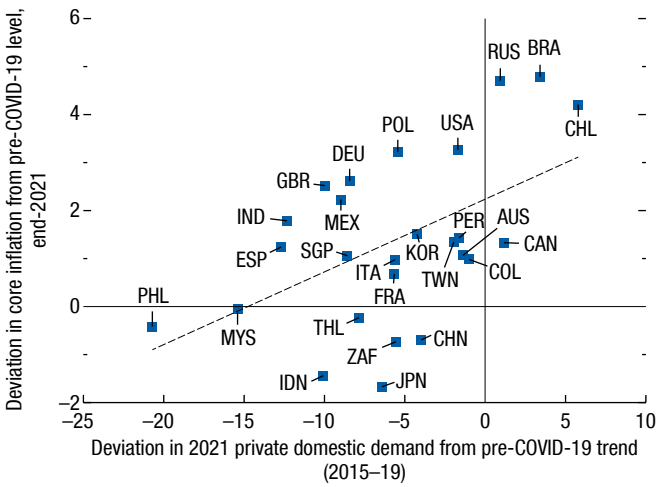


Sources: Haver Analytics; and IMF staff calculations.
Note: "Change in inflation" refers to the difference in year-over-year growth of the consumer price index between December 2020 and December 2021. Stacked bars show the contribution of each component to that change. Sample includes countries for which all components are available. This covers 26 European countries and 2 other AEs. Purchasing-power-parity weights are used for aggregation. Panel 2 shows median inflation and contributions from food and other items in 17 low-income countries, 13 in sub-Saharan Africa and 4 in Asia and the Pacific. Inflation is a 12-month comparison, measured at year-end.
AEs = advanced economies.

States. In most emerging market and developing economies rising food prices also played a significant role, as poor weather hit harvests and rising oil and gas prices drove up the cost of fertilizer. Higher prices for international food commodities impact countries differently depending on the food share of households' consumption baskets and the types of foods consumed. Households in low-income countries are particularly exposed to changes in the price of staple cereals, with diets often concentrated in just one type of grain. Low-income countries where wheat, corn, and sorghum are a large part of the diet (especially in sub-Saharan Africa) have seen inflation almost wholly driven by rising food prices. Some emerging market economies, including in the Middle East and Central Asia, have also been similarly affected by higher global food prices. The war in Ukraine and sanctions on Russia and Belarus will reinforce this effect, disrupting both the supply of food and agricultural inputs such as potash fertilizer. But in Asia, the falling price of rice mitigated cost-of-living increases for consumers in low-income countries. Looking ahead, commodity price increases are expected to persist through 2022 before easing somewhat in 2023. Futures markets indicate oil and gas prices will grow quickly in 2022 (55 and 147 percent, respectively) and then decline in 2023 as supply adjusts. Similarly, food inflation is expected to be robust (about 14 percent) in 2022, before declining modestly in 2023. The war has added to the uncertainty around these forecasts, and commodity prices are likely to be volatile over 2022–23.

Aggregate demand-supply imbalances: Demand grew rapidly in 2021, due in part to policy support. Meanwhile, a host of bottlenecks held back supply, including outbreak-induced factory closures; restrictions at ports; congested shipping lanes; container shortfalls; and worker shortages because of quarantines, possible shifts in preference, and dependent care responsibilities (see Box 1.1). As a result, core inflation, which excludes food and energy prices, has surpassed pre-pandemic rates across most economies, rising most where recoveries have been strongest (Figure 1.12). During 2022, demand is expected to soften in line with the moderating recovery and the withdrawal of broad-based extraordinary policy support. Although supply bottlenecks are generally anticipated to ease as production responds to higher prices, recurrent lockdowns in China as a result of the zero-COVID strategy, the war in Ukraine, and sanctions on Russia are likely to prolong disruptions in some sectors into 2023. This is

Figure 1.12. Core Inflation versus Private Domestic Demand
(Percent)



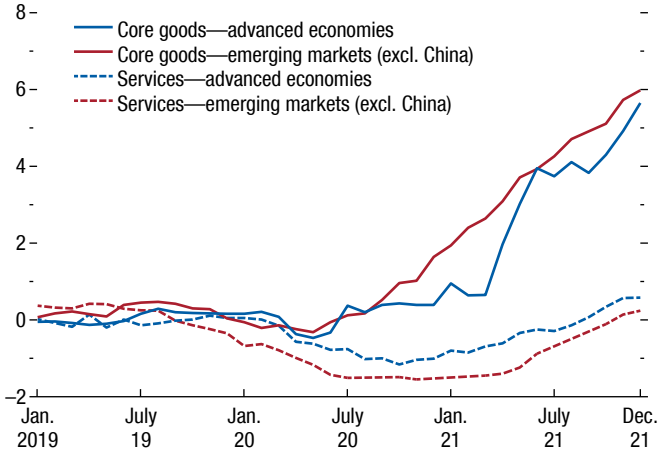
Sources: Haver Analytics; and IMF staff calculations.
Note: Core inflation is headline consumer price inflation excluding food and energy. Private domestic demand is private consumption plus private gross fixed capital formation (GFCF) (or total GFCF if private unavailable). Average over 2021 data available. Data labels use International Organization for Standardization (ISO) country codes.

expected to add to shortages not just of energy supply but also of key manufacturing inputs such as rare metals and gases.

Rebalancing of demand from goods toward services: As in-person services were more disrupted by pandemic restrictions, spending shifted toward goods. Coinciding with supply bottlenecks, this rotation put pressure on goods prices (Figure 1.13). Although service inflation started to recover in 2021, pre-pandemic spending patterns have not fully reset, and goods inflation has remained prominent in most countries. Provided the pandemic eases, services demand will pick up, and the overall consumption basket should return to pre-pandemic configurations.

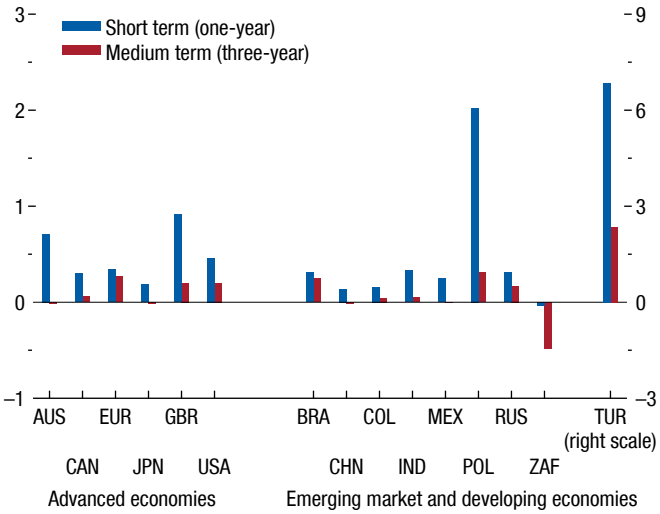
Labor supply upsides remain limited. Labor markets have tightened significantly in some advanced economies, particularly the United States and (to a lesser extent) the United Kingdom (see Box 1.1). Labor supply shortfalls—particularly in contact-intensive sectors—mean that nominal wage growth has picked up rapidly. Real wages have however fallen in general because consumer price inflation has risen faster than nominal wages. Meanwhile, labor force participation rates in advanced economies generally remain below pre-pandemic levels. In part, these developments appear related to a reluctance (or inability) of workers

Figure 1.13. Goods and Services Inflation
(Deviation from pre–COVID-19 averages, percent)



Sources: Haver Analytics; and IMF staff calculations.
Note: Lines show the difference between the year-over-year percentage change in price indices each month and the average observed during 2018 and 2019 for each sector. Core goods exclude energy and food. Countries are aggregated using purchasing-power-parity weights. Advanced economies include United States, Euro Area, Japan, Korea, Canada, and Australia. Emerging markets include Indonesia, Malaysia, Brazil, Mexico, Colombia, Chile, Russia, and South Africa.

Figure 1.14. Changes in Inflation Expectations: January 21–January 22
(Percentage points)



Sources: Consensus Economics; and IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes.

to return to work while the pandemic continues and earlier-than-planned retirements. Moreover, in some cases, even as workers are returning to employment they are working fewer hours. The baseline assumes that labor supply will gradually improve over 2022 as the health crisis abates, constraints on dependent care ease, and savings run down. The overall effect on labor supply, however, is expected to be moderate, and this is therefore unlikely to soften nominal wage increases significantly.

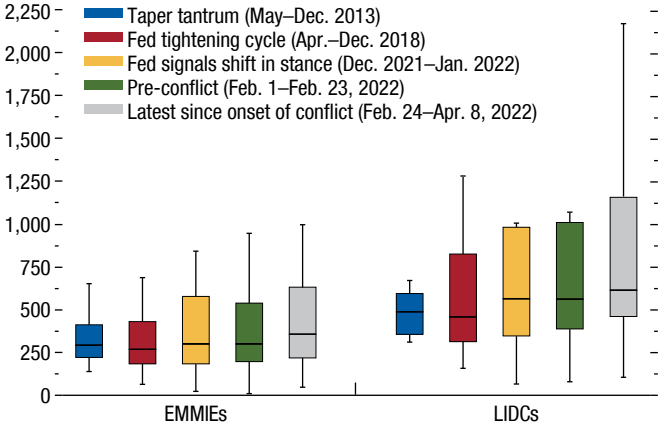
Inflation expectations remain reasonably well anchored at longer horizons, even as they have increased in the near term. In advanced economies, near-term inflation expectations have risen significantly, while pressures over longer horizons have generally been more contained (albeit with some increase in recent weeks). A similar pattern was seen in emerging markets before the war in Ukraine started, although with more variation across countries (Figure 1.14). The data suggest that the tightening stance and shift in central bank communications in recent months were viewed as enough to tame inflation over the medium term. Provided medium-term expectations continue to remain well anchored during the unfolding of the current conflict, price- and wage-setting should adjust to the developments in commodity prices, supply-demand imbalances, and labor supply described in this chapter. This would help ease inflationary pressure, even as elevated inflation is expected to persist longer than had been anticipated.

A combination of these factors could drive inflation higher than in the baseline forecast. The inflation forecast is subject to high uncertainty, principally related to the war, the pandemic, and the attendant implications for prices of commodities and inputs to production. Prolonged supply disruptions because of continued fighting or renewed flare-ups of the pandemic would further drive up costs of intermediate inputs. Against a backdrop of high inflation, sustained further increases in commodity prices could cause medium-term inflation expectations to rise—in particular in emerging market and developing economies. In a context of tight labor markets, nominal wage growth could accelerate to catch up with consumer price inflation as workers seek (and get) higher wages to account for increased living costs. This would further intensify and broaden inflation pressures.

Rising Interest Rates: Implications for Emerging Market and Developing Economies

An increase in core sovereign interest rates before the war in Ukraine had already placed pressure on borrowers in some emerging market and developing economies. Markets have so far differentiated between

Figure 1.15. Sovereign Spreads at Tipping Points
(Basis points)



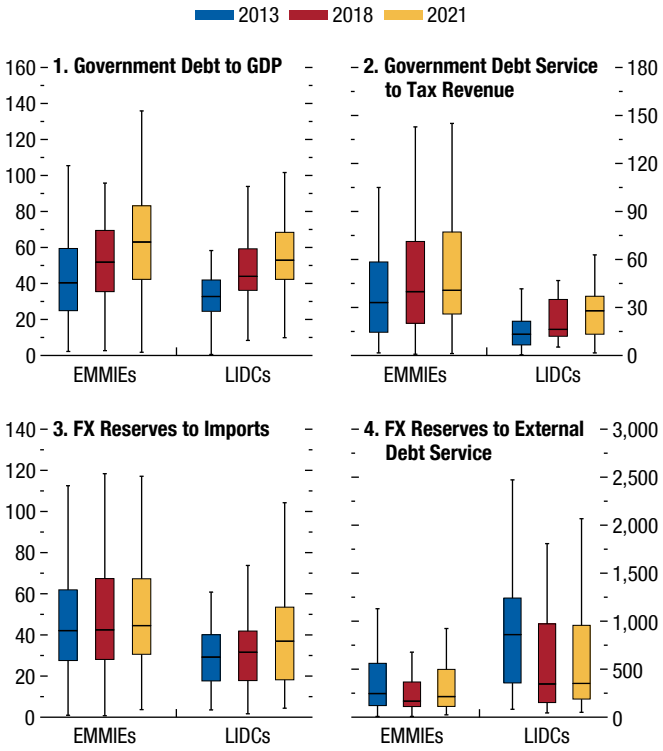
Sources: Bloomberg Finance L.P.; and IMF staff calculations.
Note: Box denotes upper quartile, median, and lower quartile. Whiskers show maximum and minimum values within the boundary of 1.5 times interquartile range from upper and lower quartiles respectively. Fed = Federal Reserve; EMMIEs = emerging market and middle-income economies; LIDCs = low-income developing countries.

countries directly and indirectly implicated in the conflict. Sovereign and credit default swap spreads have widened the most for Belarus, Russia, and Ukraine. Smaller extensions in spreads have occurred in other regional economies, such as Hungary and Poland. A generalized flight to safety as the war continues could put other economies under stress too. More broadly, average spreads had—prior to the war—looked similar to previous tightening cycles, in 2018 and in the 2013 taper tantrum. Since then, spreads have generally increased moderately (Figure 1.15). And compared with previous episodes, there is also more differentiation across borrowers, with greater dispersion of spreads now than in 2013 or 2018. This reflects heterogeneity in country circumstances, including in the buildup of private debt and contingent liabilities (see Chapter 2; the sovereign-bank nexus in emerging market and developing economies is studied in Chapter 2 of the April 2022 *Global Financial Stability Report*).

Past episodes suggest that rapid interest rate increases in advanced economies can tighten external financial conditions for emerging market and developing economies. Surprise tightening, particularly in the United States, has been associated with capital flow reversals from emerging market and developing economies, widening spreads, currency depreciations, and tighter external financial conditions (see Chapter 4 of the April 2021 *World Economic Outlook*). The effects have varied across countries depending on their debt exposures and trade linkages to advanced economies. Countries with higher debt levels and larger gross financing needs have usually been vulnerable to more extreme stress in such episodes. In these countries, increases in domestic long-term yields largely reflect increases in risk premia, over and above the effects of increases in domestic policy rates. To the extent that higher core rates may reflect more robust nominal demand in advanced economy trading partners, countries with stronger trade ties to advanced economies are less exposed.

Record debt levels induced by the pandemic leave emerging market and developing economies more vulnerable to interest rate hikes this time around. As discussed in Chapter 2, the April 2022 *Fiscal Monitor*, and Gaspar, Medas, and Perrelli (2021), the pandemic has led to unprecedented increases in sovereign debt. Figure 1.16 shows that in the median emerging market middle-income

Figure 1.16. Emerging Market and Developing Economy Vulnerabilities
(Percent)



Source: IMF staff calculations.
Note: Box denotes upper quartile, median, and lower quartile. Whiskers show maximum and minimum values within the boundary of 1.5 times interquartile range from upper and lower quartiles respectively. Import and external debt service are for the following year. EMMIEs = emerging market and middle-income economies; FX = foreign exchange; LIDCs = low-income developing countries.

economy, the debt-to-GDP ratio reached 60 percent in 2021, up from about 40 percent at the time of the 2013 taper tantrum. For low-income countries, which often have less debt-carrying capacity, the median debt is now nearly double that of 2013. With borrowing costs set to increase, interest expenses could rise significantly, placing pressure on national budgets and making it increasingly difficult to service debt.

External buffers generally remain healthy, but with variation across measures. Compared with a standard benchmark—as a ratio of imports—emerging market foreign exchange reserves look relatively healthy, exceeding their levels in either the 2013 taper tantrum and the 2018 tightening cycle. This difference is particularly pronounced for low-income developing countries, where the reserves-to-imports ratio has risen the most in relative terms—in part reflecting the 2021 allocation of Special Drawing Rights. However, when compared with external debt service, reserves have improved little for middle-income emerging market economies over the past decade and have deteriorated for low-income developing countries.

Key differences relative to past episodes further amplify current emerging market vulnerabilities. Emerging market and developing economies enter this tightening cycle with a larger fraction already under considerable stress. Some 60 percent of low-income developing countries are already in debt distress or at high risk of distress. Moreover, past episodes generally occurred at a time when large emerging markets—notably China—were expected to maintain high growth rates over the medium term, with favorable spillovers. In contrast, the current tightening episode is unfolding amid a more tentative medium-term outlook and slower potential growth than in previous episodes, especially for key emerging markets, such as China. Geopolitical tensions mean that the overall external backdrop is also considerably more difficult now. And rising food and energy prices increase the risk of domestic social unrest (see paragraph on increased social tensions below). All these elements potentially increase the sensitivity of these economies' assets to souring investor sentiment.

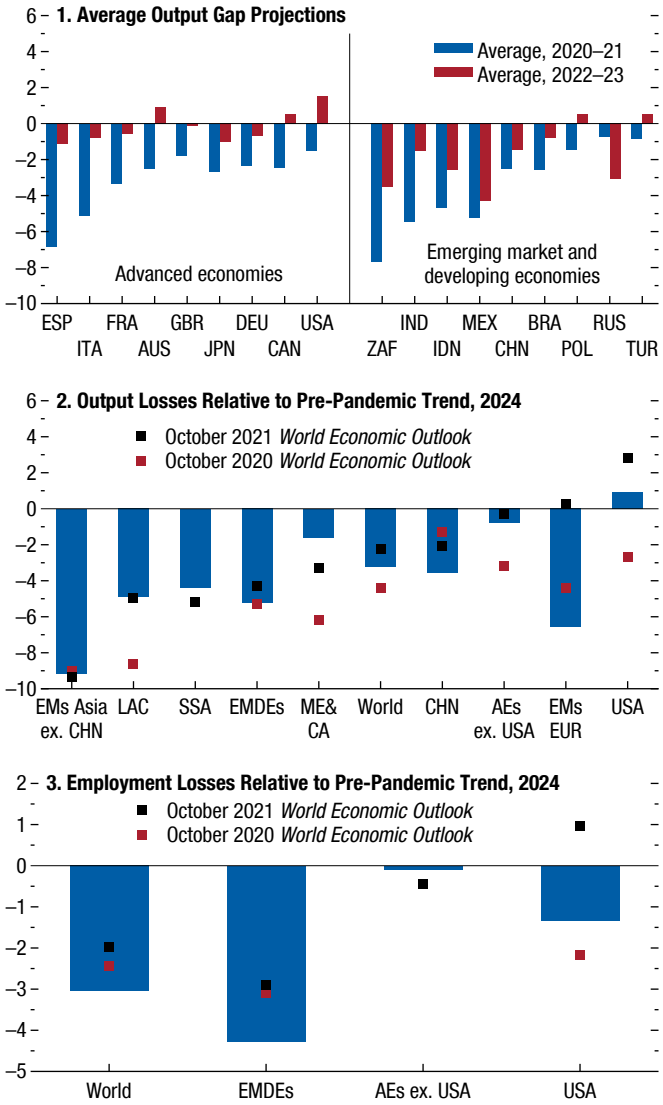
Economic Slack to Narrow in the Medium Term; Significant Scarring Expected

Beyond short-term output losses, the pandemic and geopolitical conflict are likely to leave longer-lasting footprints. First and foremost, the displacement of people and destruction of physical capital will mean that activity in Ukraine will remain well below prewar projections for some time. Elsewhere, sanctions can induce permanent dismantling of trade and supply chain linkages, entailing productivity and efficiency losses along the way. This is most prominent in Russia, where output is expected to remain below pre-war projections in the medium term. And scarring effects from the pandemic are likely to materialize through several other channels—including corporate bankruptcies, productivity losses, lower capital accumulation due to a drag on investment, slower labor force growth, and human capital losses from school closures (Chapter 2 of the April 2021 *World Economic Outlook*).

The drag on output is expected to be more salient in emerging market and developing economies. The United States is expected to reach its pre-pandemic trend output path by 2022. In other advanced economies, the shortfall relative to the pre-pandemic trend will narrow (Figure 1.17)—although further fallout from the war can slow this process in Europe. Scarring effects from the pandemic are expected to be much larger in emerging market and developing economies because of relatively larger human capital and investment losses along with more limited telework adaptability, more limited policy support, and generally slower vaccination (Figure 1.18). In those economies, economic activity and employment are expected to remain below the pre-pandemic trend throughout the forecast horizon. Overall, the pattern of forecast revisions indicates that the pandemic shock to advanced economies has been relatively more transitory; while in emerging market and developing economies it has been relatively more permanent. Both groups are more aligned in their cyclical position, comparing the evolution of output gaps (which, in part, helps account for rising inflation pressure in both sets of economies, as discussed earlier).

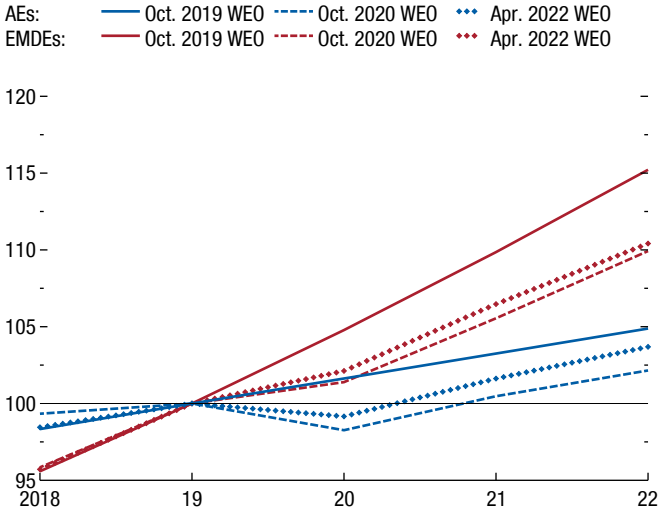
Limiting scarring will depend on public investment and health and education policy responses, as well as on the path of the war in Ukraine. For advanced economies, recent upward revisions to potential output stem not only from a reassessment of the long-lasting impacts of the pandemic, but also from the expected impact of public infrastructure investment programs in the United States and of the European Union's Next Generation EU funds. These initiatives may raise medium-term productivity through infrastructure upgrades and technological adaptation—including that associated with the green energy transition. This assumes that the war will not significantly derail those plans and that scarring

Figure 1.17. Medium-Term Prospects: Output and Employment
(Percent, unless noted otherwise)



Source: IMF staff calculations.
Note: Output gap in panel 1 is the difference between real and potential GDP as a percent of potential GDP. Output in panel 2 is real GDP. Medium-term losses in panels 2 and 3 are the difference between forecasts of the indicated variable (for 2024) relative to the January 2020 WEO *Update* vintage. The sample of countries in panel 3 comprises those that have comparable employment projections in both vintages. The EMDE employment aggregate excludes China and India due to changes in employment definitions across vintages. Data labels use International Organization for Standardization (ISO) country codes. AEs (ex. USA) = advanced economies (excluding the United States); EMs = emerging market economies; EMs (Asia ex. CHN/EUR) = emerging market economies (in Asia excluding China, in Europe); EMDEs = emerging market and developing economies; LAC = Latin American and Caribbean economies; LICs = low-income countries; ME&CA = Middle Eastern and Central Asian economies; SSA = sub-Saharan African economies. WEO = *World Economic Outlook*.

Figure 1.18. Potential GDP
(Index, 2019 = 100)



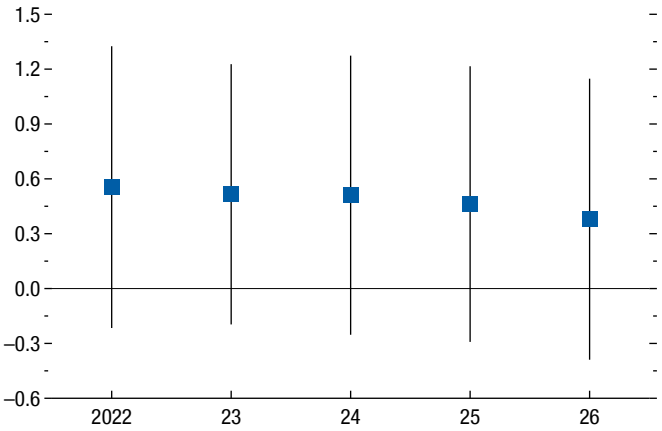
Source: IMF staff calculations.
Note: Potential real GDP projections indexed to 2019 values. Each line reflects a different vintage of *World Economic Outlook* (WEO) projections. AEs = advanced economies; EMDEs = emerging market and developing economies.

effects from the conflict remain largely contained to the countries directly involved. More limited public investment responses and relatively bigger challenges to remedy learning losses mean that upward potential output revisions are not as large in emerging market and developing economies. Importantly, improvements in vaccination rates have also been associated with upward revisions to output projections across the forecast horizon (Figure 1.19). This pattern reinforces the importance of continuing pandemic mitigation policies.

Trade Growth to Moderate, External Imbalances to Narrow over Medium Term

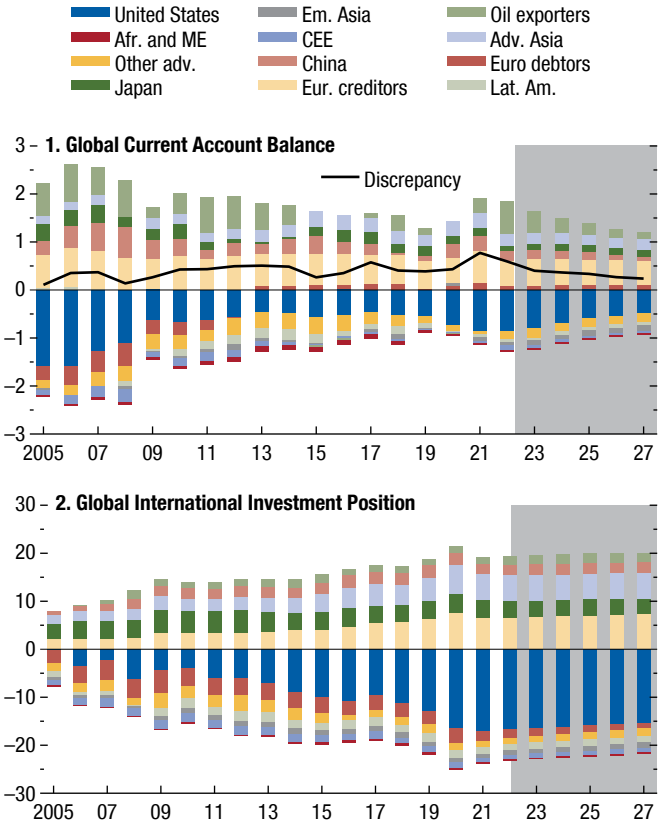
Global trade: Reflecting the significant slowdown in overall activity, global trade growth is expected to decline notably in 2022. Global goods demand is expected to moderate because of the war as extraordinary policy support is withdrawn and as demand rebalances back toward services. Cross-border services trade—especially tourism—is however expected to remain subdued because of the war and lingering effects of the pandemic. Overall, global trade growth is projected to slow from an estimated 10.1 percent in 2021 to 5 percent in 2022 and further to 4.4 percent in 2023 (1 and 0.5 percentage points lower than in the January forecast). Over the medium term, trade growth is expected to decline to about 3.5 percent.

Figure 1.19. Correlates of Projected Output Revisions to Vaccinations
(Percentage points)



Sources: IMF, Database of Country Fiscal Measures in Response to the COVID-19 Pandemic; Our World In Data; and IMF staff calculations.
Note: Figure shows point estimates and 90 percent confidence intervals (with heteroscedasticity-consistent standard errors) for coefficients of a cross-sectional, cross-country regression (unweighted) of forecast revisions at different horizons since the October 2021 *World Economic Outlook* on the set of explanatory variables (fiscal support, vaccinations, and cases) and region fixed effects. Fiscal support refers to additional above-the-line spending and forgone revenues and liquidity support in response to COVID-19 between June 5, 2021, and September 27, 2021, as a share of GDP. Vaccinations and cases are the difference in the cumulative share of population either fully vaccinated or diagnosed with COVID-19 between Septempber 30, 2021, and April 8, 2022. Explanatory variables are standardized to have zero mean and unit standard deviation.

Figure 1.20. Current Account and International Investment Positions
(Percent of global GDP)



Source: IMF staff estimates.
Note: Adv. Asia = advanced Asia (Hong Kong SAR, Korea, Singapore, Taiwan Province of China); Afr. and ME = Africa and the Middle East (Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Jordan, Kenya, Lebanon, Morocco, South Africa, Sudan, Tanzania, Tunisia); CEE = central and eastern Europe (Belarus, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Turkey, Ukraine); Em. Asia = emerging Asia (India, Indonesia, Pakistan, Philippines, Thailand, Vietnam); Eur. creditors = European creditors (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, The Netherlands, Norway, Sweden, Switzerland); Euro debtors = euro area debtors (Cyprus, Greece, Ireland, Italy, Portugal, Spain, Slovenia); Lat. Am. = Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay); Oil exporters = Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Russia, Saudi Arabia, United Arab Emirates, Venezuela; Other adv. = other advanced economies (Australia, Canada, France, Iceland, New Zealand, United Kingdom).

Global current account balances—the sum of country surpluses and absolute levels of deficits—widened for a second successive year in 2021 largely because of pandemic-related factors. These include a continued high export volume of medical equipment and work-from-home electronics as the pandemic maintained its grip and remote work prevailed for the most part. Across regions, the widening reflected a bigger deficit in the United States—in part related to continued large fiscal support—and higher surpluses among its main trading partners, notably China and the euro area. The strong oil price rebound in 2021 also contributed to a widening of external surpluses for exporters and deficits for importers. Current account balances are expected to remain elevated in the near term. Although projected to narrow subsequently (Figure 1.20, panel 1), the future path is uncertain because of the effects of the war, the path of the pandemic, and the related effects on commodity prices and trade patterns.

Global creditor and debtor positions: External assets and liabilities narrowed slightly in 2021 as a share of global GDP, returning close to 2019 levels (Figure 1.20, panel 2). This reflects the recovery in global activity—which strengthened the denominator of the ratio—and valuation changes. External assets and liabilities are however projected to remain close to all-time highs, posing risks to both debtor and creditor economies (see the 2021 *External Sector Report*).

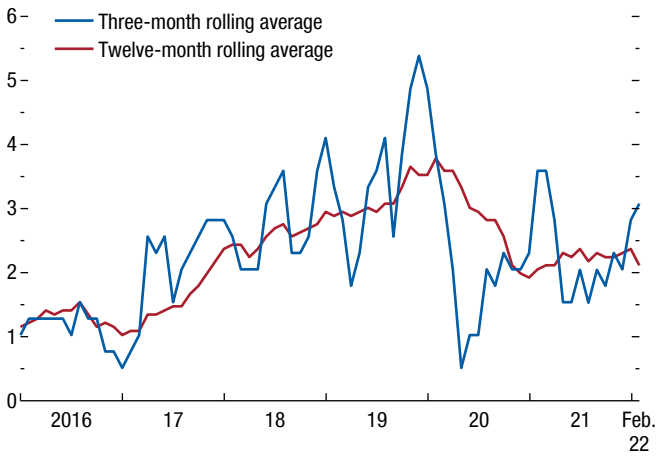
Risks Are Large and to the Downside

The risks to the outlook are to the downside. Although a fast resolution of the war in Ukraine would lift confidence, ease pressure on commodity markets,

and reduce supply bottlenecks, it is more likely that growth could slow further and inflation turn out higher than expected. Overall, risks are elevated and broadly comparable to the situation at the start of the pandemic—an unprecedented combination of factors shapes the outlook, with individual elements interacting in ways that are inherently difficult to predict. Many of the risks described below are essentially an intensification of forces already present in the baseline. Moreover, the realization of near-term risks can precipitate medium-term risks and make it harder to address longer-term challenges. The most prominent negative risks include the following.

- *A worsening of the war* would exacerbate the direct and indirect effects factored in the baseline forecast. Principally, these include further amplifications of the humanitarian crisis in Ukraine and the influx of refugees into neighboring countries. In addition, tighter sanctions could lead to additional ruptures of trade connections—including crucial energy links between Russia and Europe—with detrimental effects on cross-border investment. This would lead to more supply disruptions, global price rises, and volatility in commodity markets, with further declines in regional and global output (see Scenario Box). Although direct foreign claims on Russian institutions appear limited, a default on obligations would impact balance sheets abroad and possibly reveal indirect exposures elsewhere in the financial system, with adverse effects beyond immediate partners. This includes a potential further sharp repricing of emerging market risk (see below). The risk of cybersecurity breaches has also increased, with the potential to cripple critical infrastructure and financial intermediation.
- *Increased social tensions:* Following a dramatic decline during the pandemic, unrest has reemerged in recent years, although it has not yet reached its pre-pandemic peak (Figure 1.21). The war in Ukraine has increased the probability of wider social tensions in the near term through two main channels. The first is a further sharp rise in global fuel and food prices—a particular concern in emerging market and developing economies with limited fiscal space that are highly dependent on energy and food imports for basic consumption. This could intensify commodity hoarding, export controls, and domestic restrictions—with further knock-on effects on supply disruptions, prices, and social unrest. The second is the longer-term impact of the humanitarian crisis. Although host nations have responded with immense generosity, the sheer volume of refugees could overwhelm local support. And such pressures will be amplified should the conflict spread or persist. In the longer term, large refugee inflows may exacerbate preexisting social tensions and fuel unrest.

Figure 1.21. Fraction of Countries with a Major Unrest Event
(Percent)



Source: Barrett and others (2020).
Note: Social unrest events are inferred from exceptionally large increases in country media coverage of key terms related to protests, riots, and other forms of civil disorder. The figure shows the one-sided 3- and 12-month rolling averages of the fraction of countries with unrest events.

- *A resurgence of the pandemic:* Although conditions are improving, the pandemic may yet take another turn for the worse—as seen, for example, with recent rising caseloads in China and elsewhere in the Asia-Pacific region. Although the original Omicron strain ended up being relatively mild in terms of severe illness for the vaccinated, it is too soon to assess the threat its subvariants pose. A more dangerous mutation, perhaps one that retains Omicron's ability to dodge immunity but with enhanced lethality, would be a significant blow.
- *A worsening slowdown in China:* A prolonged downturn in China is another immediate risk that could expose structural weaknesses such as high local government liabilities, property developer leverage, household debt, and a fragile banking system. Such a scenario would also result in reduced demand for exports from many middle- and low-income countries in the region and—in the case of more prolonged lockdowns—could disrupt goods supply for the rest of the world. In addition, the combination of more transmissible variants and the strict zero-COVID policy could continue to hamper

economic activity and increase uncertainty. Larger disruptions could impact key commercial activities, including through port lockdowns.

- *Rising medium-term inflation expectations:* Inflation expectations remained reasonably well anchored in most economies during the pandemic. Despite recent rises, markets expect inflation to moderate over the medium term as central banks around the world respond. Inflation expectations have so far risen substantially in only a few emerging market and developing economies. Yet with already high inflation and rising energy and food prices, higher inflation expectations could become more widespread and, in turn, lead to further increases in prices. Moreover, with nominal wage growth still running behind price inflation in most countries, there is a risk that pent-up wage increases will materialize and add to overall price pressures. In such a scenario, monetary policy would need to respond more aggressively than currently expected, further weighing on the outlook.
- *Higher interest rates leading to widespread debt distress:* The pandemic led to record levels of public debt around the world. As interest rates rise, this will strain public budgets with tough choices around fiscal consolidation over the medium term, as pressures for social and, in some cases, defense spending may remain high. A successful transition will require credible fiscal frameworks. Should adjustment fail and the credibility of these frameworks be undermined, a confidence crisis might emerge leading to correlated capital outflows—particularly from emerging markets—and could create simultaneous debt crises. The probability of this outcome would increase significantly if monetary policy in advanced economies has to react even more strongly to inflation pressures than anticipated. More generally, higher interest rates could lead to a disorderly correction of currently stretched asset prices, including housing.
- *A wider deterioration of the geopolitical environment:* In the longer term, the war in Ukraine risks destabilizing the rules-based frameworks that have governed international relations in the post–World War II period. Increased international polarization, or a more widespread conflict, would worsen the humanitarian crisis and impede the global economic integration essential for long-term prosperity. Technological exchange may be limited, production networks and technology standards could coalesce into distinct blocks, and welfare gains from globalization could be reversed if countries adopt more protectionist policies. Reorganization is also possible in the international monetary system: a segmentation of global reserve assets and emergence of alternative cross-border payment systems could arise as a result of fragmented production blocks. Moreover, fracturing international relationships could also undermine the trust and cooperation vital to addressing long-term structural challenges, including climate change, debt resolution, and trade barriers. If this risk materializes, the global economy will likely suffer through an unpredictable transition to a new political reality, with financial volatility, commodity price fluctuations, and dislocation of production and trade along the way.
- *The ongoing climate emergency:* Despite some steps on the path toward a green transition, global emissions are—on current trends—very likely to overshoot the Paris Agreement temperature goals by the end of the century and lead to catastrophic climate change (with low-likelihood outcomes such as the ice sheet collapse, abrupt ocean circulation changes, and some extreme events and warming that cannot be ruled out). Indeed, the effects of warming are already starting to show: droughts, forest fires, floods, and major hurricanes have become more frequent and more severe. And it is often those least able to cushion the blows of such events who are also most exposed to them. Depending on their implementation, policies to speed the green transition could have near-term inflationary effects (see the Commodities Special Feature)—which could weaken support for the vital climate policy agenda. The overall effect on inflation will also depend on whether carbon pricing is accompanied by lower labor taxation (for example, as part of a budget-neutral shift to fossil fuel taxation). Meanwhile, the war in Ukraine will likely have an important bearing on the energy transition. In the short term, war-induced energy supply shortfalls and higher prices could mean an increased reliance on dirtier fossil fuels, such as coal, as a stopgap. But in the longer term, the fallout from the conflict and strategic motives for energy independence could also speed investment in renewables. Current geopolitical tensions, however, risk derailing the global cooperation necessary for an orderly energy transition.

Interconnectedness of the risks to the outlook: Risks that most directly affect the short-term outlook (for example, inflation and interest rates) can still have cascading effects in the longer term (for example, undermining the climate agenda and harming fiscal

solvency, respectively). Moreover, efforts to support vulnerable groups and mitigate the fallout from the war can limit the space available to insure against more medium-term risks, such as catastrophic climate change.

Policies to Sustain the Recovery and Improve Medium-Term Prospects

The war in Ukraine has exacerbated difficult policy trade-offs: between fighting inflation and safeguarding the pandemic recovery; and between supporting those impacted by rising living costs and rebuilding fiscal buffers. Meanwhile, the pandemic remains stubbornly persistent, and structural issues, such as inequality and climate change, remain unresolved. And with high public debt, space to respond is severely constrained. The war in Ukraine also poses new multilateral policy challenges—most pressing is the growing humanitarian crisis in the region. How should policymakers respond?

Fighting inflation: As noted, global inflation to an extent reflects supply-demand imbalances, which intensified during the recovery last year, partly as a result of policy support. However, some of the factors contributing to high inflation have been largely beyond the control of central banks, with prices of energy and food driven by global supply shocks—including the war in Ukraine. Monetary authorities should carefully monitor the pass-through of rising international prices to domestic inflation expectations in order to calibrate their responses. In some places, including the United States, inflationary pressure had strengthened considerably and become more broad-based even before the Russian invasion of Ukraine—buoyed by strong policy support. In other countries, the prominence of fuel- and war-affected commodities in local consumption baskets could lead to broader and more persistent price pressures. In both cases, tighter monetary policy will be appropriate to check the cycle of higher prices driving up wages and inflation expectations, and wages and inflation expectations driving up prices.

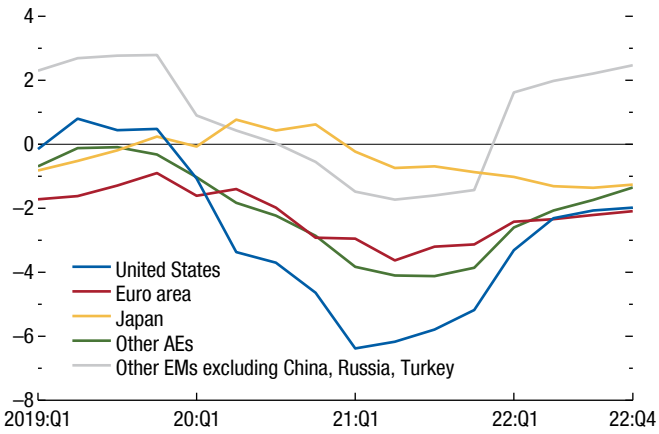
Central banks should continue to clearly articulate the policy outlook and adjust the monetary stance in a data-dependent manner. The transmission of the shock of the war in Ukraine will vary across countries, depending on trade and financial linkages, exposure to commodity price increases, and the strength of the preexisting inflation surge. The appropriate monetary policy response will therefore differ across economies. In the United States—where moderate direct war effects are expected, inflationary pressure has been broadening, labor markets continue to tighten, and nominal wage growth has been robust—the rate-hiking cycle should continue. The decision to tighten will be tougher in countries where adverse growth effects from the war are more prominent and yet inflation is rising—particularly in Europe. In those cases, the pace of policy tightening should be calibrated to the severity of the war's adverse impact on activity, and forward guidance should signal readiness to shift the monetary stance in a data-dependent way to maintain the credibility of inflation-targeting frameworks.

Inflation expectations will be an important signal of this credibility. As such, the recent upward drift in inflation expectations is of concern, even though they have generally been concentrated at relatively short horizons (Figure 1.14). Expectations must remain well anchored over longer horizons to ensure the credibility of policy frameworks. In countries where expectations have risen more sharply, central banks should clearly communicate the importance of inflation stabilization in their objectives, backing this with policy action where necessary. Some emerging market central banks have already taken aggressive action to get ahead of price pressures, while others are only just getting started. Nonetheless, as advanced economy central banks tighten policy, any resulting currency depreciations in emerging markets could cause higher inflation expectations and necessitate further increases in policy rates.

A key issue for the medium term is where interest rates will settle after the pandemic. Even with the anticipated increases in policy rates, given the outlook for inflation, short-term real interest rates at the end of 2022 are likely to be negative (Figure 1.22). With inflation at multidecade highs in the United States, the United Kingdom, and the euro area, a crucial question is how high policy rates will have to rise in order to stabilize inflation. In past episodes, lengthy periods of tighter policy were needed to bring inflation under control. For example, during the 1980–82 disinflation in the United States, the federal funds rate exceeded headline consumer price inflation long after price pressures started to ease.[2] Currently it is not yet

[2]Annual US headline consumer price inflation peaked at 14 percent in the first half of 1980, but the federal funds rate reached its peak of 19 percent only in the first half of 1981. US inflation had declined to 3 percent by 1983, but the effective real federal funds rate remained positive long into the second half of the 1980s.

Figure 1.22. Real Policy Rates
(Percent)



Source: IMF staff calculations.
Note: Euro area's projection part is estimated by using 16 individual euro area countries' projections. Other AEs and other EMs comprise 12 and 10 economies, respectively. AEs = advanced economies; EMs = emerging markets.

clear whether and for how long the real rate will need to be positive (that is, when the policy rate exceeds the rate of expected inflation). How far interest rates will ultimately rise depends to an important extent on the post-pandemic neutral rate. Since the global financial crisis of 2008, neutral interest rates have been thought to be very near zero, cramping (conventional) monetary policy space. Their future level depends on structural developments that influence saving and investment, which are currently in flux (Box 1.2). Given high uncertainty around the policy path beyond 2022–23, central banks should communicate clearly their perspective on the post-pandemic neutral rate and, if needed, their readiness to maintain policy rates above that benchmark for as long as needed to bring inflation down to target—giving markets some clarity on the likely endpoint for rate hikes.

Preparing for tighter financial conditions and spillovers from geopolitical volatility: Regulators should take early action and tighten selected macroprudential tools to target pockets of elevated vulnerabilities (see the April 2022 *Global Financial Stability Report*). This is particularly important with monetary policy on a tightening path and elevated geopolitical uncertainty, which raise the potential for sudden risk repricing that would bring those vulnerabilities to the fore. Insolvency frameworks may also need to be strengthened in some cases, including with more reliance on out-of-court mechanisms to expedite processes. Emerging market borrowers should reduce near-term rollover risks by extending debt maturities where possible and contain the buildup of currency mismatches. Exchange rate flexibility can in general help absorb shocks. But in economies with shallow foreign exchange markets, sudden capital flow reversals can jeopardize financial stability. In those economies, foreign exchange intervention may be needed to address disorderly conditions; in imminent crisis circumstances, temporary capital flow management measures may be warranted—but should not substitute for needed macroeconomic policy adjustment.

Supporting the vulnerable while maintaining fiscal soundness: Fiscal policies should depend on exposure to the war, the state of the pandemic, and the strength of the recovery. Following a huge and necessary fiscal expansion in many countries during the pandemic, debt levels are at all-time highs. The need for consolidation should not prevent governments from prioritizing spending to protect and help vulnerable populations affected by the war in Ukraine and the pandemic.

In countries facing large price increases, targeted income support can be used to alleviate stress on household budgets. But as with pandemic-induced transfers, this support should be designed to deliver maximum relief to the most vulnerable at lower cost (for example, through means testing and gradual phaseout above certain income thresholds). In countries facing refugee inflows, integration support should be adequately funded with strong multilateral support (see paragraph on providing a coordinated response to the humanitarian crisis, below). On the health side, funding for vaccine production and distribution, campaigns to encourage take-up, testing, and therapies should all remain protected. Pandemic-era transfers will need to be better targeted.

Where the pandemic is subsiding, previous support measures can be phased out to recover fiscal space. Firms affected by war-related disruptions (including shortages of inputs or diminished access to trade finance) may however require temporary, targeted support through credit guarantees or transfers. But it is essential that these measures be directed to affected firms with operations that are viable over the medium term; otherwise, such initiatives would hinder the reallocation of resources needed for the recovery. Indeed, the post-pandemic future will likely require cross-sectoral labor reallocation (see Chapter 3 for one aspect, the energy transition). Labor market and income support policies should be designed to provide

a safety net for workers in transition without hindering future employment growth. Training programs, hiring subsidies, and programs that match workers and firms should remain a priority, along with limited and temporary public support for displaced workers.

The ability to fund these initiatives will be limited by available fiscal space. Revenue mobilization and expenditure measures can help alleviate these constraints—broadening the tax base and enhancing compliance, scaling back broad subsidies and recurrent expenditures, and strengthening public financial management. Many countries will thus need to develop credible plans to stabilize their finances over the medium term (see Chapter 2 of the October 2021 *Fiscal Monitor*). This would also create space for near-term priority spending—particularly in the case of emerging market and developing economies facing the prospect of higher borrowing costs as monetary policy tightens in advanced economies. Fiscal frameworks with simple rules that promote debt sustainability but are still flexible enough to manage shocks (including well-designed escape clauses) can help achieve such consolidations.

Where fiscal space permits and when monetary policy is constrained at the national level—for instance by the Effective Lower Bound or in a monetary union—broader fiscal support may be warranted, depending on the severity of the decline in aggregate demand. But this support should be deployed in ways that avoid exacerbating ongoing demand-supply imbalances and price pressures.

Health policies and preparedness: The virus continues to evolve, and COVID-19 could be around for the long term. The best defense is to ensure that each country has equitable access to a comprehensive COVID-19 toolkit with vaccines, tests, and treatment. Yet the rollout of many COVID-19 tools continues to proceed at unequal speeds. Over 100 countries are not on track to reach the IMF pandemic proposal's mid-2022 vaccination target of 70 percent, and similar inequality persists in access to tests and treatments. Regarding vaccines, substantial supply increases in recent months mean that in-country absorptive capacity is emerging as the key barrier. Keeping a broad set of tools updated as the virus evolves will require ongoing investments in medical research, disease surveillance, and health systems that reach the last mile in every community.

Embracing positive structural changes: Structural change is essential for countries looking to grow after the pandemic. Improvements in digital communications will allow businesses to reap the benefits of new technologies, particularly in emerging market and developing economies. Likewise, retooling and reskilling workers are crucial to allow them to participate in the digital economy. The pandemic has interrupted schooling for many children across the world, but most critically in low-income countries, where online alternatives are less readily available. Without action to offset these learning losses, this setback to global education will affect productivity, earnings, and growth for many years. In the short term, lower tariffs and fewer barriers to trade would not only allow for more efficient allocation of productive resources but may also help ease supply bottlenecks and inflation pressure. With possible long-lasting disruptions to trade and reconfigurations of supply chains in the aftermath of the war in Ukraine, such measures are even more essential.

Tackling the climate emergency: Recent geopolitical events have brought into sharp relief the need for a coordinated approach to bring about the steady replacement of fossil fuels with renewables and other low-carbon energy sources. According to the International Energy Agency a threefold increase in clean energy investment is needed by 2030 to accelerate decarbonization of the power sector and electrify end uses of energy. In the medium term a step change is needed in fiscal policy—notably involving carbon pricing (or equivalent mechanisms) and fossil fuel subsidy reform to shift private investment. Pricing should be supplemented with supportive policies; for example, subsidies for renewables, public investment in enabling infrastructure such as smart grids, and feebates to reinforce incentives without further raising energy costs and bosting inflation. Some revenue could fund transition measures (for example, targeted compensation to those who are harmed) and to ensure buy-in. Reforms when energy prices are high may be less popular, but the surge in global fossil fuel prices underscores the need to shift economies toward cleaner energy that depends less on fluctuations in international prices. Permanent carbon and fuel subsidies (or tax relief) motivated by short-term price spikes must be avoided.

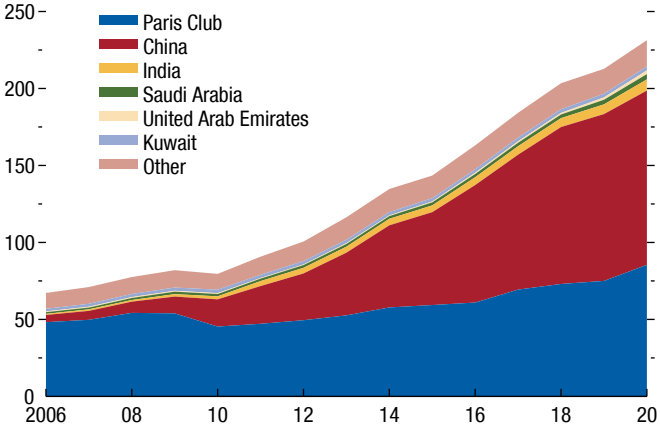
Multilateral cooperation: Given the international and mutual nature of many of the policy challenges, international cooperation and multilateral agencies will be essential. Main tasks include:

- *Providing a coordinated response to the humanitarian crisis:* The magnitude of refugee flows from Ukraine calls for a coordinated response. Given the greater burden on neighboring countries—particularly in the short-term—assistance must come from both

European and multilateral institutions. This includes emergency assistance as well as access to budget support financing to facilitate the integration of migrants if they are not able to return home. Once the war ends, concerted international efforts will be needed to support reconstruction in Ukraine.

- *Maintaining liquidity in the global financial system:* International cooperation will be essential to manage the coming monetary tightening cycle. Access to emergency liquidity is a crucial backstop against international financial spillovers. During the pandemic, rapid financing instruments and credit facilities extended a lifeline to many economies, and a new Special Drawing Rights allocation boosted reserves. As the pandemic subsides, IMF facilities will continue to address imbalances, help devise credible adjustment paths to macroeconomic stability, and create conditions for sustained, inclusive medium-term growth. Central banks should be prepared to activate emergency swap lines as needed to reduce the risk of foreign currency liquidity hoarding and deposit withdrawals in overseas jurisdictions.
- *Guaranteeing an orderly system for resolving debt:* Some cases call for more than liquidity support alone to avoid debt distress. For these, a timely and orderly resolution of debt is the best way to mitigate the economic consequences. Yet complicated claims with many lenders can hinder this process (Figure 1.23). To address this problem, the Group of Twenty (G20) has endorsed the Common Framework for Debt Treatments, setting out a consistent approach to international debt resolution. Its application must be stepped up; the three countries that have requested relief under the terms of this agreement have experienced significant delays. And the expiration in 2021 of the G20's Debt Service Suspension Initiative program—which allowed low-income countries to suspend debt service payments temporarily without penalty—makes orderly debt resolution even more pressing.
- *Climate policies:* Despite almost 140 countries setting long-term net zero emissions targets, there is still a large gap between global mitigation ambition and policy action on climate change. Greenhouse gas emissions need to be cut by one-quarter to one-half by 2030 to be consistent with limiting warming to 1.5 to 2 degrees Celsius. At COP26, almost 140 countries committed to net zero emissions sometime around midcentury.

Figure 1.23. Public External Debt, by Creditor
(Billions US dollars)



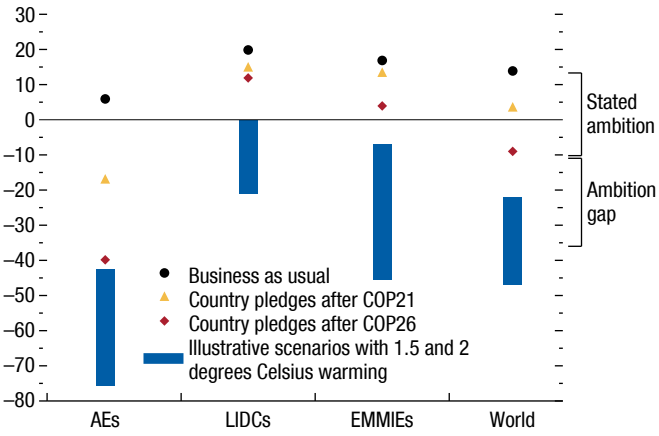
Source: World Bank, International Debt Statistics.
Note: The figure shows public and privately guaranteed debt of countries eligible for the Debt Service Suspension Initiative. In terms of International Organization for Standardization (ISO) country codes, the Paris Club is composed of AUS, AUT, BEL, BRA, CAN, CHE, DEU, DNK, ESP, FIN, FRA, GBR, IRL, ISR, ITA, JPN, KOR, NLD, NOR, RUS, SWE, USA.

However, only a third of countries increased their near-term targets substantively, mostly advanced economies (Figure 1.24). And there is an even larger gap in policy action. Policies equivalent to a global carbon price of at least $75 are required by 2030 to limit warming to 2C—and even more for 1.5C. Scaling up ambition and action to narrow these gaps could be done in an equitable way, with advanced economies delivering the deepest cuts and emerging market and developing economies increasing their commitments. International coordination regimes, such as price floors among large emitters, and multilateral climate finance initiatives will likely be needed to address competitiveness and policy uncertainties that hinder unilateral action.[3]

- *Providing global public health goods:* As the world winds down from an emergency response to the pandemic, the focus should return to other global health priorities that have received less attention over the past two years. The world should not face a painful trade-off between saving lives from

[3]On the proposal for an international carbon price floor, see Parry, Black, and Roaf (2021). Also see Chateau, Jaumotte, and Schwerhoff (forthcoming), who show that the proposal helps scale up reductions in global emissions and improves international burden sharing (relative to a uniform carbon price) while addressing competitiveness effects.

Figure 1.24. Changes in Emissions in 2030 versus 2021 under NDCs and Warming Scenarios
(Percent change a year)



Source: Black and others (2021).
Note: AEs = advanced economies; COP26 = United Nations Climate Change Conference 2021; COP21 = United Nations Climate Change Conference 2015; EMMIEs = emerging market and middle-income economies; LIDCs = low-income developing countries; NDCs = nationally determined contributions.

COVID-19 and from other diseases, such as malaria and tuberculosis. In this context, up-front financing from international donors is still an urgent priority. And closing the $23.4 billion funding gap for the Access to COVID-19 Tools (ACT) Accelerator is an important first step. In addition, enhanced coordination between finance and health ministries is essential to increasing resilience—in the face both of potential new SARS-CoV-2 variants and of future pandemics that could pose systemic risk.

- *Cooperation on taxation and cross-border trade:* Policymakers should continue to cooperate on cross-border tax matters to support revenue and equity (Chapter 2 of the April 2022 *Fiscal Monitor*) and avoid export controls and barriers to cross-border trade that will exacerbate supply disruptions. In a more difficult multilateral environment, countries should also avoid adding to the long list of existing trade disputes that further imperil global economic prospects.

Scenario Box

The IMF's G20 model is used to explore the global macroeconomic implications of a scenario in which the sanctions on Russia arising from the war in Ukraine escalate further. In the scenario sanctions are broadened mid-2022 to include additional embargoes on oil and gas and the disconnection of Russia from much of the global financial and trade system.

In such a scenario the impact would propagate to the rest of the world through higher commodity prices, disruptions to supply chains, and tighter financial conditions. The resulting supply shock, at a time when commodity prices and inflationary pressures are already high, would lead to an upward shift in inflation expectations and require a greater tightening in monetary policy, further amplifying the negative impact on global activity. Except for oil and some commodity exporters, most countries would be negatively impacted by the economic fallout, with countries in the European Union more affected than other advanced and emerging market economies given their larger exposure.

The scenario assumptions are presented in three separate layers for ease of exposition.

Commodities, Supply Chain, and Inflation

Russian trade and productivity. Russia's current baseline forecast is for existing sanctions to produce a large contraction in non-energy exports, while energy exports decrease moderately. Under the adverse scenario the decline in energy exports is instead larger, with oil and gas export volumes decreasing by 10 percent in 2022 and 20 percent in 2023 relative to the current baseline, and with volumes remaining at their lower 2023 levels through the rest of the forecast horizon. The additional sanctions also affect Russia's non-oil exports, which decline by 7 percent in 2022 and 15 percent in 2023, again relative to the current baseline, and remaining at their 2023 level through 2027. Russia's loss of access to foreign technology and investment is amplified, triggering a persistent decline in total factor productivity growth.

Commodity prices. The global supply of several commodities decreases in this scenario. As a result, oil prices increase by 10 percent in 2022 and 15 percent in 2023, while metal prices increase by 5 percent in 2022 and 7.5 percent in 2023 (all relative to baseline). Food commodity prices also increase, including because of the impact of higher energy prices on fertilizer costs, with a broad food index increasing by 4 percent in 2022 and 6 percent in 2023. Natural gas prices in Europe are assumed to rise by roughly 20 percent above baseline in 2022; Asian countries experience a similar increase due to the integration between the two markets. The increase in commodity prices is assumed to fade gradually beyond 2023 as supply responds and demand decreases.

Supply disruptions and confidence. Shortages of several commodities lead to additional disruption of supply chains, most notably in Europe, and add to the impact on inflation and activity. The combination of supply disruptions and higher energy prices in Europe, and Asia to a lesser extent, leads to weakened confidence, further dampening activity in those regions.

Inflation Expectations

The supply shock in the scenario triggers an increase in short-run inflation expectations over 2022–23. The increase is more pronounced in countries where inflation is initially higher, such as the US and some EMs, or where the supply shock is expected to be larger, such as in Europe and developing countries. For reference, the increase in one-year ahead inflation expectations in the US is around 70 bp in 2023. The fading of the commodity shock, the endogenous monetary policy response, and the impact from lower demand bring short-term expectations back to target after 2023. An increase in longer-term inflation expectations would amplify the negative macro impact but is not considered here.

Financial Conditions

A broadening of sanctions will tighten domestic financial conditions in Russia further than has been the case so far. It is also assumed that sanctions halve the value of Russia's positive net foreign asset position, further dampening domestic demand. In the rest of the world, a risk-off episode also generates further tightening in financial conditions. Emerging markets experience an increase in both corporate and sovereign spreads; advanced economies face higher corporate spreads. The magnitude of the tightening is assumed larger in European countries.

Finally, regarding the fiscal policy response, automatic stabilizers are assumed to operate in the scenario but no additional discretionary response is included. The economic impact from the adverse scenario would be lower should such a response take place.

Scenario Box *(continued)*

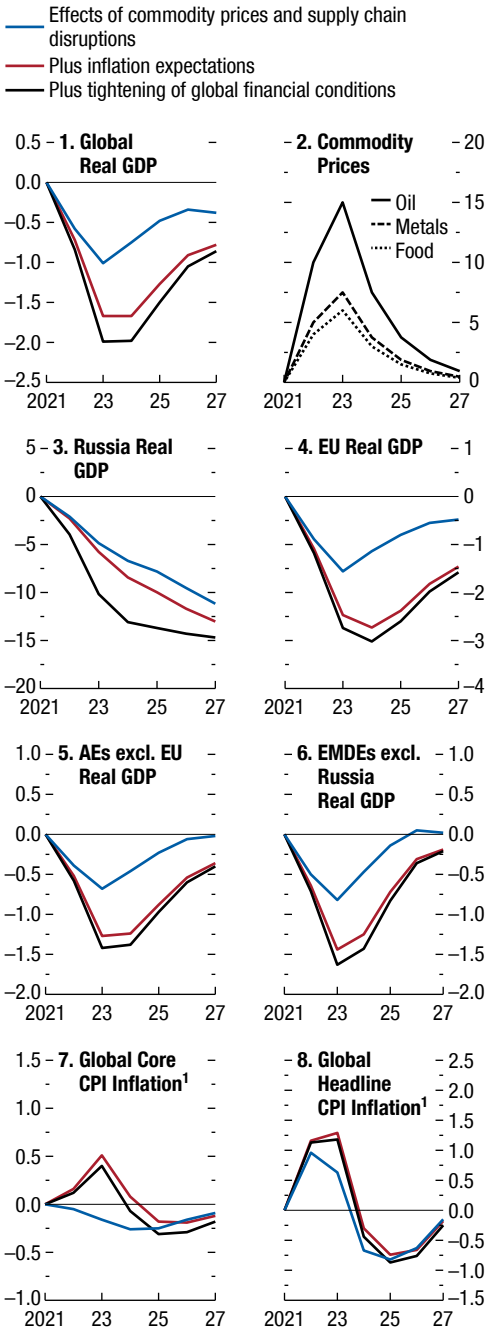
Global Macro Impact

Scenario Figure 1 presents the effect from each layer cumulatively and as deviation from baseline. For Russia, broader sanctions lead to a large, continued contraction in activity, reflecting the hit to exports, lower productivity, and tighter financial conditions. The cumulative impact implies that GDP is about 15 percent lower than baseline by 2027, coming on top of the large decrease in GDP already in the baseline relative to pre-conflict projections.

The impact on the European Union is sizable, with the level of GDP close to 3 percent below baseline by 2023, reflecting the impact from higher commodity prices but also from higher inflation expectations. Advanced economies excluding the EU and emerging economies excluding Russia see an impact on the level of activity of around –1.5 percent, by 2023, with greater variation among emerging market economies as those that are net oil exporters (not shown separately) benefit. Global GDP decreases by about 2 percent by 2023; the decrease is somewhat persistent, and global activity remains about 1 percent lower than in the baseline by 2027, with more than half of that decline coming from the hit to activity in Russia.

The scenario also results in higher inflation in both 2022 and 2023. Global headline inflation increases by more than 1 percentage point in both 2022 and 2023. Core inflation increases by half a percentage point in 2023, again on top of high inflation in the baseline. The disinflationary effect of the underlying decrease in global activity starts to dominate after that, and inflation eventually falls below baseline by 2024.

Scenario Figure 1. Downside Scenario
(Percent deviation from baseline, unless noted otherwise)



Sources: IMF, Group of 20 model simulation; and IMF staff estimates.
Note: AEs = advanced economies; CPI = consumer price index; EMDEs = emerging market and developing economies; EU = european union.
[1]Percentage point deviation from baseline.

Box 1.1. The Puzzle of Tight Labor Markets: US and UK Examples

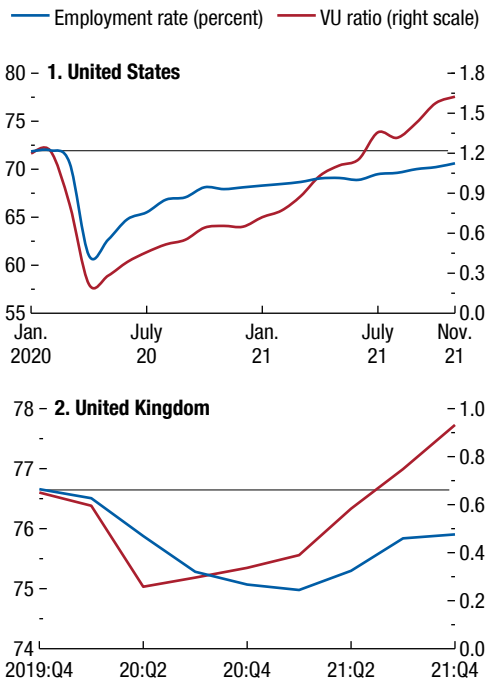
Two years into the COVID-19 pandemic, a puzzle has emerged in several advanced economies: unfilled job vacancies have increased sharply even though employment has yet to fully recover.[1] The United States and the United Kingdom are two cases in point: most recent vacancies-to-unemployment ratios are significantly above pre–COVID-19 levels, but employment rates are not (Figure 1.1.1). This box sheds light on several factors that have contributed to this puzzling labor market phenomenon, including (1) labor market mismatch—discrepancies between the types of vacant positions and the skills of job seekers; (2) health-related concerns, which may be a strong driver of the withdrawal of older workers from the workforce; (3) changing job preferences among workers, which may account in part for historically high quit rates—a phenomenon sometimes called the "Great Resignation"; and (4) school and childcare center disruptions leading mothers of young children to exit the labor force—the "She-cession."

Mismatch: The impact of the pandemic and lockdown measures differed markedly among industries and occupations. They hit particularly hard in sectors that require in-person interaction, such as accommodation and food services and arts and entertainment; "teleworkable" jobs fared substantially better. This resulted in mismatch that, however, receded gradually as hard-hit industries recovered from the COVID-19 shock and hired again throughout 2020 and 2021 (see also Pizzinelli and Shibata 2022). As of the third quarter of 2021, labor market mismatch accounted for at most one-fifth of the shortfall in the employment rate vis-à-vis the pre-COVID level in both the United Kingdom and the United States.

COVID-driven fall in labor force participation among specific demographic groups: The inactivity rate of older workers rose markedly above its pre–COVID-19 trend after 2020, with no subsequent reversion (Figure 1.1.2). Health concerns and, to a lesser extent in 2020–21, pension plan valuation gains have contributed to this labor force withdrawal, which by the fourth quarter of 2021 accounted for a third of the employment gap in the United Kingdom and the United States relative to pre-pandemic levels. Likewise, prolonged school closures and scarce childcare opportunities kept some women with young children home in the United States. This was not the case in the United Kingdom, possibly because nurseries largely remained open throughout the pandemic.[2]

Changing worker preferences: Rates of voluntary job quits have reached historic highs in both countries. There is tentative evidence that, beyond seizing new opportunities to move up the job ladder in tight labor markets, workers' preferences may have partly shifted toward jobs that bring not only higher pay but also greater safety and flexibility. In particular, several industries in which job quit rates have risen the most

Figure 1.1.1. Employment Rate and Labor Market Tightness
(Percent, ratio)



Sources: Current Population Survey and Job Opening and Labor Turnover Survey for United States; Labour Force Survey and Office of National Statistics for United Kingdom; and IMF staff calculations.
Note: VU ratio = vacancies-to-unemployment ratio.

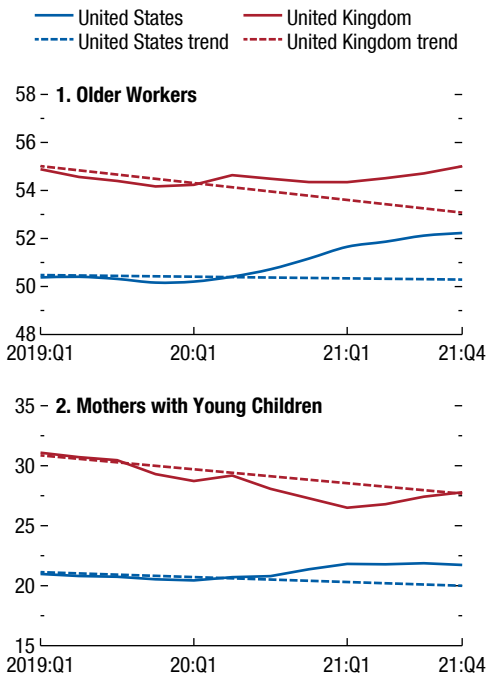
The authors of this box are Myrto Oikonomou, Carlo Pizzinelli, and Ippei Shibata.

[1]For a broader analysis of labor market tightness in advanced economies, see Duval and others (2022).

[2]Besides older workers and women with young children, Duval and others (2022) document that the employment recovery is particularly lagging for low-skilled workers and that the decline in immigration has also contributed to labor shortages in low-skill occupations.

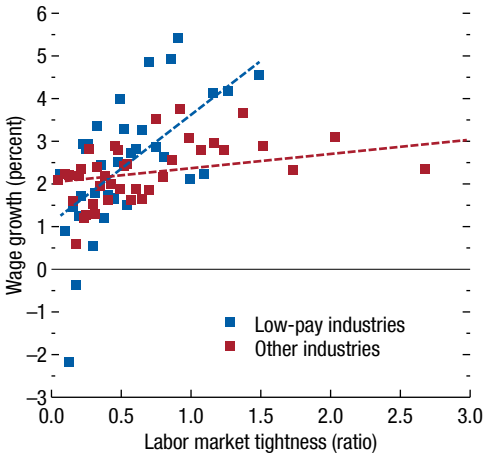
Box 1.1 *(continued)*

Figure 1.1.2. Inactivity Rates
(Percent)



Sources: Current Population Survey and Job Opening and Labor Turnover Survey for United States; Labour Force Survey and Office of National Statistics for United Kingdom; and IMF staff calculations.
Note: Older workers are aged 55–74; young children are aged 5 or younger. Linear trends are estimated over 2015–19.

Figure 1.1.3. United States Wage Growth and Tightness across Sectors
(Percent, ratio)



Sources: Current Population Survey; Job Opening and Labor Turnover Survey; and IMF staff calculations.
Note: Wage growth is year-over-year quarterly nominal hourly wage inflation. Tightness (measured as the vacancy-to-unemployment ratio) is lagged one quarter between 2003:Q1 and 2020:Q1. Each dot represents the mean of the *x*-axis and *y*-axis variables for each of the 40 equal-sized bins of the *x*-axis variable. Low-pay industries are accommodation and food services, retail trade, and arts and entertainment.

involve a disproportionate share of contact-intensive, physically strenuous, less flexible, and low-paying jobs, such as in accommodation and food services and retail trade.

Rising labor market tightness has spurred faster nominal wage growth, particularly for low-paying jobs.[3] Since the start of the pandemic, the increase in tightness alone is estimated to have directly increased overall nominal UK and US wage inflation by approximately 1.5 percentage points. In low-pay industries, this impact has been much greater, reflecting both above-average increases in labor market tightness and a stronger historical link between tightness and wage growth in these industries (Figure 1.1.3). So far, overall implications of increased tightness for wage inflation have been muted, partly because low-wage workers account for a relatively small share of firms' total labor costs. To the extent that tightness remains concentrated primarily in these jobs, the pass-through from wage growth in low-pay occupations to economy-wide price inflation is likely to remain limited. However, with price inflation largely or (more than) fully outpacing wage increases so far, and given persistent labor markets, overall nominal wage growth is likely to remain solid. Workers' demands for a pay raise to compensate for fast-rising prices, along with an increase in their inflation expectations, could intensify inflation pressure, more so than tight labor markets.

[3]In the United Kingdom and the United States, nominal wages are already growing faster than before the pandemic, although these gains have been largely or more than fully eroded by price inflation. (See Duval and others [2022] for more discussion.)

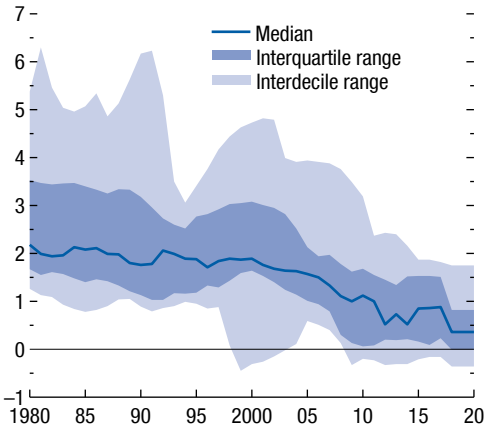
Box 1.2. Determinants of Neutral Interest Rates and Uncertain Prospects

The endpoint of the monetary tightening cycle that started in many economies over the first months of 2022 is heavily contingent on the evolution of the neutral rate of interest—the real interest rate consistent with a closed output gap and stable inflation. If neutral rates continue to decline as they have over the past four decades, inflation stabilization can be achieved with relatively less tightening. Given such policy relevance, it is crucial to revisit the long-term dynamics and determinants of neutral rates to project their future path.

The fall in neutral interest rates has been a common phenomenon in many advanced economies since the 1980s. Despite some cross-country differences, the decline became more homogenous over the years, converging to very low values (Figure 1.2.1). The literature identifies some factors that can explain such decline. Lower fertility rates and longer life expectancy led to an increase in the share of older people in the population, boosting the supply of savings and depressing interest rates (Platzer and Peruffo 2022). At the same time, slower productivity growth (Eggertsson, Mehrotra, and Robbins 2019) and the decline in the price of capital goods (Sajedi and Thwaites 2016; Chapter 3 of the April 2019 *World Economic Outlook*) slowed investment spending and, consequently, led to a reduction in savings demand. High income inequality in many advanced economies has also contributed to lower interest rates, due to higher saving rates at the top of the income distribution (Straub 2019; Mian, Straub, and Sufi 2021a). Last, capital flows have upset the savings-investment balance in individual countries. Increased demand for safe assets, notably in emerging market economies (Bernanke 2005; Caballero and Farhi 2014), and higher risk premiums (Kopecky and Taylor 2020) are argued to put downward pressure on interest rates. Descriptive evidence generally supports these explanations (Figure 1.2.2).

Predicting neutral rates is a challenging task, in part because neutral rates are unobservable, and there is estimation uncertainty even about the past. In addition, the role of each determinant is hard to disentangle, and their future development is under debate.[1] Some argue that continued improvements in life expectancy (Blanchard 2022) and the ongoing global demographic transition (Auclert and others 2021) will maintain downward pressure on interest rates. Goodhart and Pradhan (2020), however, argue for a demographic reversal, which will raise neutral rates. Unless inequality increases revert, downward pressure on neutral rates is bound to continue (Mian, Straub, and Sufi 2021b). If China were to resume consumption-led growth, this may reduce the so-called savings glut and could have global effects. Slower reserve accumulation by emerging and developing market economies may have a similar impact. In addition, to the extent that pandemic-related uncertainty is resolved, liquidity preferences could shift and precautionary saving may decline as a result, leading to an increase in neutral rates. Rachel and Summers (2019) note that more generous social insurance and higher debt across Organisation for Economic Co-operation and Development countries were a major counteracting force in the past and prevented neutral rates from falling even further. In this regard, Blanchard (2022) points out that increases in demand that are only temporary—such as the stimulus package in the United States—are unlikely to lead to long-lasting increases in neutral rates.

Figure 1.2.1. Estimated Neutral Rates Since 1980
(Percent)



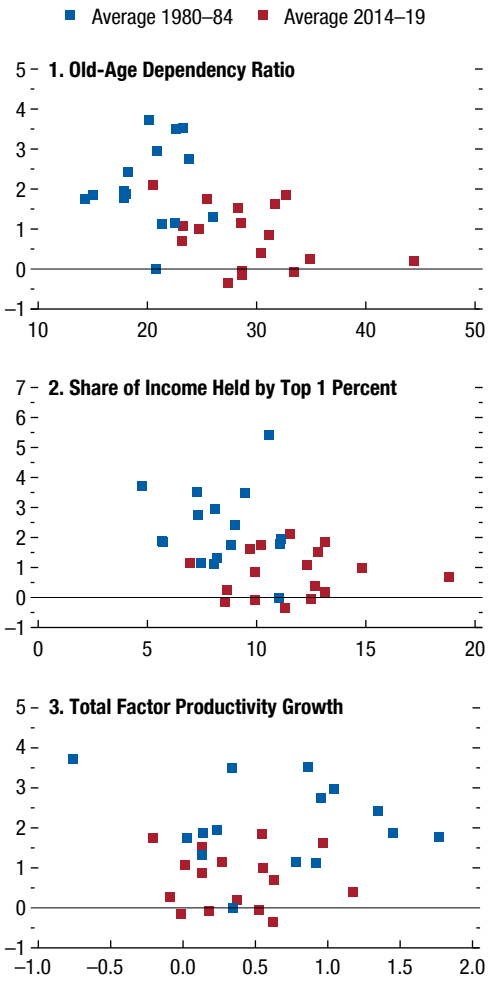
Source: IMF staff estimates.
Note: In terms of International Organization for Standardization (ISO) country codes, the sample comprises: AUS, BEL, CAN, CHE, DNK, ESP, FIN, FRA, GBR, ITA, JPN, NLD, NOR, SWE, USA.

The authors of the box are Francesco Grigoli, Josef Platzer, and Robin Tietz.

[1]The determinants of neutral rates often exhibit similar time trends, making it difficult to quantify the contribution of each one of them.

Box 1.2 *(continued)*

Figure 1.2.2. Neutral Rate Factors
(Percent)



Source: IMF staff calculations.
Note: The title of each panel represents the units on the *x*-axis, in percent. For example, panel 1 shows the old-age dependency ratio on the *x*-axis in the range of 10–50 percent. The *y*-axis for each panel is the neutral interest rate. In terms of International Organization for Standardization (ISO) country codes, the sample comprises AUS, BEL, CAN, CHE, DEU, DNK, ESP, FIN, FRA, GBR, IRL, ITA, JPN, NLD, NOR, USA.

Taking a more long-term view holds additional lessons. Borio and others (2017), using data ranging as far back as 1870, argue that changes in monetary regimes have an impact on neutral rates. Grigoli, Platzer, and Tietz (forthcoming) find evidence that structural shifts in policy frameworks, as well as financial intermediation, can be relevant for neutral rates of interest. Recent strategy reviews by the European Central Bank and the Federal Reserve highlight the relevance of these conclusions by showing how policy frameworks continue to evolve. Relatedly, the terminal size of central bank balance sheets could also affect prospects for the neutral interest rate. To conclude, forecasting neutral rates calls for extra caution given ongoing structural transformation involving the rise of shadow banking, fintech, and the climate transition.

Special Feature: Market Developments and the Pace of Fossil Fuel Divestment

Primary commodity prices rose 24 percent between August 2021 and February 2022. Energy commodities, especially natural gas, drove the increase, due first to rising geopolitical tensions and later to Russia's invasion of Ukraine, while the Omicron COVID-19 variant created short-term volatility in late 2021. Base metal prices increased by 2 percent and precious metal prices rose by 3 percent, while agricultural commodities increased by 11 percent. This special feature also analyzes the pace of fossil fuel divestment. Anticipation of lower fossil fuel demand has likely reduced capital expenditures in oil and gas globally over the past three to four years—especially for publicly traded companies—reducing their investment by about 20 percent.

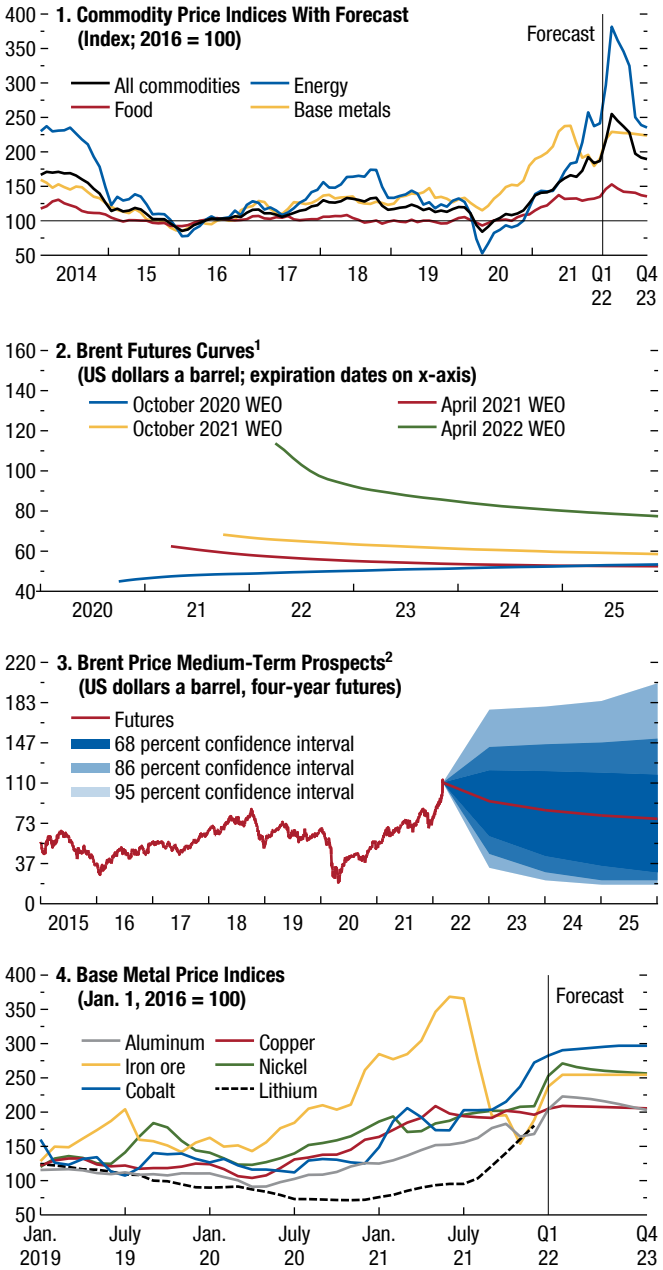
Oil and Gas Prices Up amid Ukraine War

Crude oil prices increased by 36 percent between August 2021 and February 2022, driven by a strong recovery in oil demand, with short-lived effects of the Omicron variant in late 2021, followed by geopolitical tensions and Russia's invasion of Ukraine in February 2022. Brent crude oil temporarily reached $140 in early March as markets started to shun Russia's Urals oil and several countries banned imports of Russian oil.

Supply was already tight before the war, as OPEC+ (Organization of the Petroleum Exporting Countries, plus Russia and other non-OPEC oil exporters) members continued to ease supply curbs at a measured pace and production in major non-OPEC+ countries increased slowly. Non-OPEC+ producers had been focused on cash generation rather than investment, partly because of the energy transition. More countries are now seeking to reduce dependence on Russian energy, so supply disruptions have so far been buffered by globally coordinated releases of strategic petroleum reserves, while spare capacity has not been tapped.

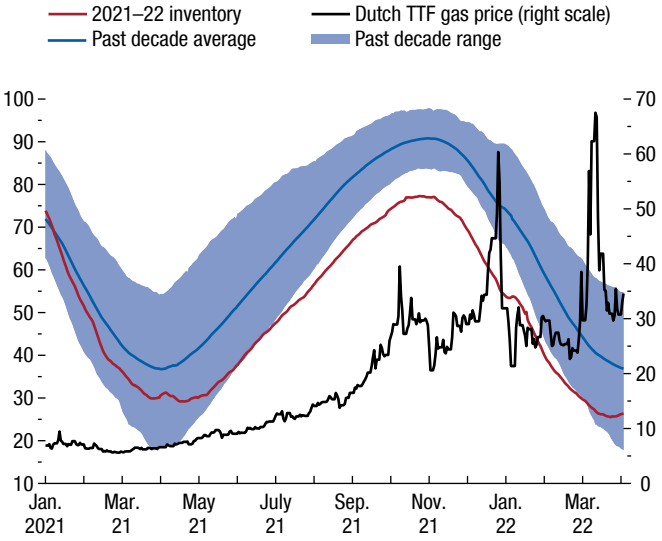
Global demand for oil in 2022 is projected to increase to 99.7 million barrels a day (mb/d) in 2022 (up 2.1 mb/d from 2021), according to the International Energy Agency—a downward revision of 1.1 mb/d compared with demand before the war in Ukraine. The risk of a major decline in Russian oil exports has caused a significant upward shift of the futures curve, with a spike in front-month futures prices (Figure 1.SF.1, panel 2). Futures markets suggest

Figure 1.SF.1. Commodity Market Developments



Sources: Bloomberg Finance L.P.; IMF, Primary Commodity Price System; Refinitiv Datastream; and IMF staff calculations.
Note: WEO = *World Economic Outlook*.
[1]WEO futures prices are baseline assumptions for each WEO and are derived from futures prices. April 2022 WEO prices are based on March 3, 2022 closing.
[2]Derived from prices of futures options on March 3, 2022.

Figure 1.SF.2. European Gas Inventory and Gas Price
(Percent; US dollars per million British thermal units)



Sources: Argus Media; Gas Infrastructure Europe; and IMF staff calculations.
Note: Last observation is Mar. 29, 2022. Past decade refers to 2011–20.
TTF = Title Transfer Facility.

crude oil prices will increase 55 percent in 2022 and fall slightly thereafter, while short- and medium-term upside risks to oil prices remain elevated and include long-term downside risks from the energy transition (Figure 1.SF.1, panel 3).

Natural gas markets were driven by energy security concerns in Europe and low average storage levels going into last winter (Figure 1.SF.2). This led to greater competition with northeast Asia for spot cargoes of liquid natural gas, resulting in a global increase in natural gas prices, except in North America. Natural gas prices are expected to remain high until mid-2023 amid supply and energy security concerns, while Europe plans to reduce dependence on Russian natural gas. Coal prices rose 55 percent and reached historic highs in early March, reflecting tight supply-demand balances, production disruptions, and the shunning of Russian coal.

Metal Prices Rise to 10-Year Highs

The base metal index initially retreated from a 10-year high in July 2021, mainly owing to iron ore prices falling 13.8 percent amid temporary restrictions on steel production and slowing construction activity in China (Figure 1.SF.1, panel 4). The index began to recover in December as steel production curbs were lifted. Increased demand for electric vehicle batteries sent prices higher for cobalt, nickel, and lithium. The war in Ukraine and sanctions partially disrupted metal and mineral exports from Russia and Belarus. Precious metal prices increased thanks to an upward shift in inflation expectations.

Base metal prices are expected to rise by 9.9 percent in 2022, compared with a decline of 6.5 percent in the October 2021 *World Economic Outlook,* and to remain unchanged in 2023. Risks to the outlook are to the upside due to continued disruptions of trade in metals with Russia and higher energy costs. Precious metal prices are expected to rise 5.8 percent in 2022 and 2.1 percent in 2023.

Agricultural Prices Rise on War, Weather, and Higher Fertilizer Costs

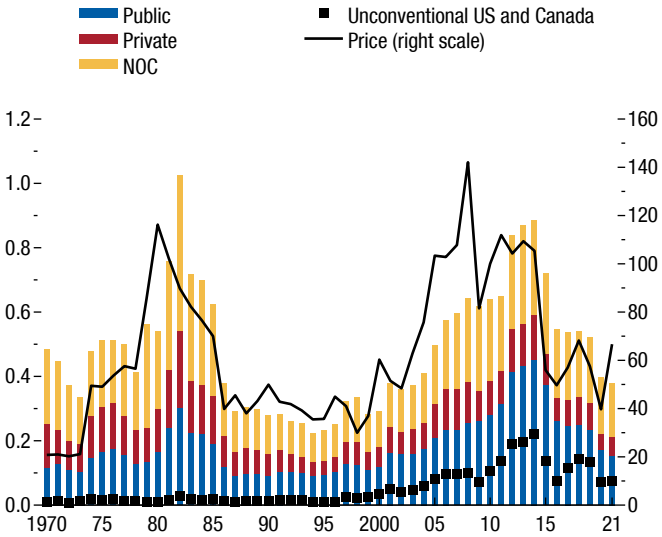
An increase of 17.2 percent in beverage prices and a 21.8 percent rise in cereal prices drove up the cost of food but was partially offset by a 5.3 percent decline in sugar prices and a 4.8 percent fall in vegetable prices. Wheat prices rose by 26.4 percent, as a severe drought in Canada and across the northern plains of the United States reduced spring wheat supplies. Looking ahead, a continuation of war in Ukraine—a major producer of wheat and corn—and falling Russian exports could fuel an additional surge in world cereal prices; adverse weather and fertilizer prices remain sources of upside risk for all food prices.

Pace of Fossil Fuel Divestment and Effect on Prices

The clean energy transition requires a substantial reduction in fossil fuel investment. The recent energy crisis, however, has raised concerns that, relative to the speed of adoption of renewable energy, the pace of divestment from fossil fuels is too fast, especially for oil and gas.[1] The next sections present recent trends in oil and gas investment and study their main drivers, examining the role of the shale boom, climate policies, and, more generally, the energy transition. They illustrate the starkly different effects that supply- and demand-side climate policies may have on prices of fossil fuels.

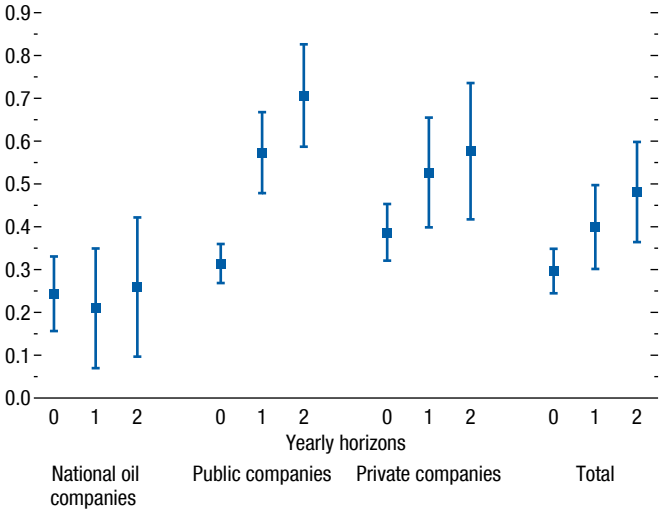
[1]Fossil fuels still account for more than 80 percent of primary energy consumption, globally (IEA 2021a). Three-quarters of the CO_2 reductions from a globally efficient mitigation in the next decade would come from reduced use of coal rather than of oil and gas.

Figure 1.SF.3. Oil and Gas Investment as Share of World GDP
(Percent; US dollars a barrel)



Sources: Bloomberg Finance L.P.; International Energy Agency; Rystad Energy UCube; US Bureau of Economic Analysis; and IMF staff estimates.
Note: The oil and gas price is the average of West Texas Intermediate crude oil and Henry Hub natural gas prices weighted by global oil and gas production, divided by US GDP deflator. NOC = national oil company.

Figure 1.SF.4. Price Elasticity of Global Oil and Gas Capital Expenditure



Sources: Rystad Energy UCube; US Bureau of Economic Analysis; and IMF staff estimates.
Note: Results are based on a regression of global nominal capital expenditures (in log differences) on two lags of an oil and gas price index (in log differences) plus controls, over the sample years 1971–2020. See Online Annex 1.SF.1 for details.

Oil and Gas Investment Has Declined Sharply since 2014

About half of total energy investment in 2021 was in fossil fuels—half of which was oil and gas *upstream* investment (IEA 2021a). The latter shapes the future production capacity of natural gas, crude oil, and condensates—and, thus, the supply of petroleum products, ranging from petrochemicals (such as ethylene and benzene) to jet fuel and motor gasoline.

After booming during the so-called shale revolution, global upstream oil and gas investment peaked at 0.9 (3.6) percent of global GDP (investment) in 2014. Since then, it declined to less than 0.5 (1.5) percent of global GDP (investment) in 2019, falling further during the pandemic (Figure 1.SF.3). The cyclical reversal disproportionately affected publicly traded companies, which cut oil and gas investment more than national oil companies—consistent with investment declining more notably in the Americas and Africa, as opposed to the Middle East and Russia.[2]

Swings in capital expenditure are not unusual in the oil and gas industry, though. Using data from 1970 to 2019, an empirical analysis shows that oil and gas prices are the main drivers of capital expenditure (Online Annex 1.SF.1). A 10 percent increase in oil and gas prices typically raises global oil and gas investment 3 percent in the same year and 5 percent after two years, cumulatively (Figure 1.SF.4). National oil companies tend to be less reactive since their investment decisions are often driven by a broader set of considerations.

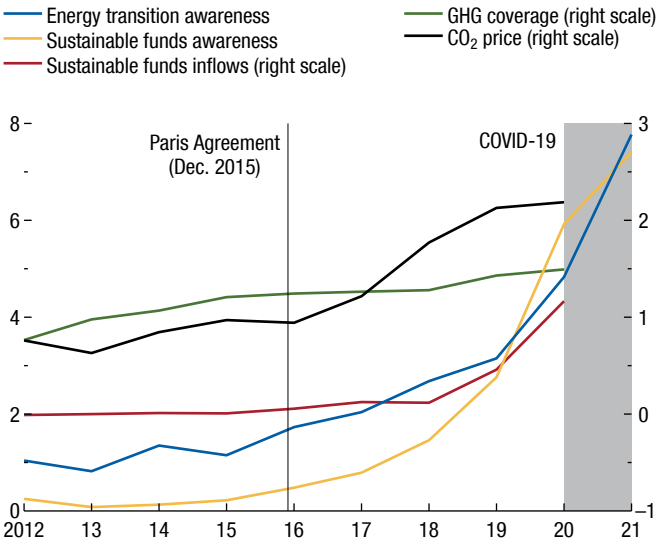
Fossil fuel investment followed a typical boom-bust cycle over the past decade. However, since oil and gas prices declined 50 percent between 2014 and 2016 and then recovered partially, the 40 percent decline in capital expenditure between 2014 and 2019 was deeper than the model's prediction, which suggests a 20 to 25 percent decline. While many factors could have been involved, the next section explores the role the clean energy transition may have played.

Climate Policies, the Energy Transition, and the Rise of Sustainable Investing

The energy transition affects oil and gas investment through three main channels: a *demand-side* channel related to existing demand-side climate policies (that is, carbon taxes on fossil fuel consumption); an *expectation channel* related to future fossil fuel demand

[2]The oil and gas investment share of the Americas and Africa (Middle East and Russia) combined declined (increased) by 2 (4) percentage points from 2010–14 to 2015–21, on average.

Figure 1.SF.5. Climate Policy and Energy Transition Indicators



Sources: Google Trends; World Bank; and IMF staff calculations.
Note: The proxies for energy transition and sustainable funds as well as the GHG coverage (in percent) were divided by 10 to adjust the scale. The price of CO_2 is expressed in dollars per ton. Sustainable funds inflows are presented as share of global gross fixed capital formation, in percent. GHG = greenhouse gas.

(for example, solar and wind investment subsidies or announced demand-side policies such as future bans on internal combustion engines); and a *supply-side channel*. Top-down supply-side policies (such as regulatory restrictions and bans on fossil fuel production) and bottom-up shifts in public preferences (such as portfolio shifts related to sustainable investment) increase the cost of capital for fossil fuel projects (see the April 2022 *Global Financial Stability Report*).

Supply- and Demand-Side Effects on Capital Expenditure

To study the three channels, a set of climate-related policy indicators based on hard and soft data was collected (Figure 1.SF.5 and Online Annex 1.SF.1). Text-based analysis captures public awareness of the energy transition (the expectation channel)—which increased sharply after 2018. The demand-side channel is captured by carbon taxes (CO_2 prices and greenhouse gas emission coverage by emission trading systems). Their increase slowed in 2019. The supply-side channel is captured by sustainable investing awareness and portfolio inflows into sustainable funds, which have both increased sharply since 2018.

A firm-level regression (see Online Annex 1.SF.1) is then used to assess the impact of the climate indicators on fossil-fuel-producing companies' capital expenditure (treatment group). Non-energy companies are used as the control group. Data are from 2012 to 2020, but the estimation sample excludes the pandemic period:

$$y_{ist} = a + \lambda D_s + \left(\beta_1 C_t + \beta_2 P_{oil,t}\right) D_s + \gamma X_{ist} + \varepsilon_{ist}, \quad (1.SF.1)$$

in which y_{ist} is log capital expenditure in firm i, group s, year t; a is a constant; D_s is the "treatment dummy," equal to 1 for oil and gas companies and 0 otherwise; $P_{oil,t}$ is the oil and gas price; and X_{ist} includes log total assets, debt-to-equity ratio, asset turnover, Altman credit strength, region, industry, and year fixed effects. C_t represents either a dummy since the Paris-Agreement on climate change in 2016 or a climate policy indicator. Energy companies in the treatment group derive most of their revenue from the upstream oil and gas sector and show little ability to diversify into green energy.

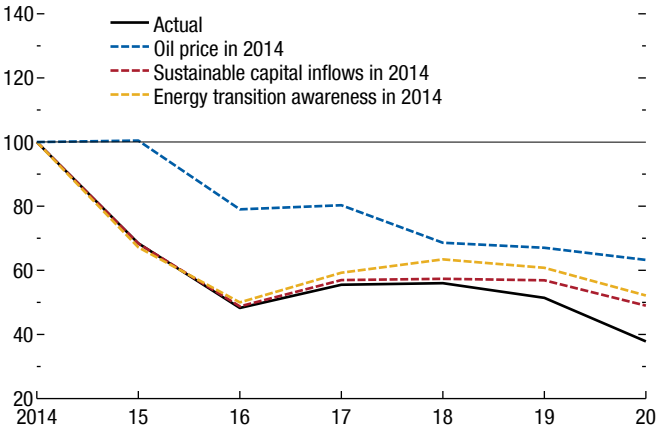
Estimation Results Point to Capital Investment Slump

After the Paris Agreement, capital expenditure of a typical oil and gas company was 35 percent lower than that of the control group, even when factoring in firm-level variables, according to results shown in detail in Online Annex 1.SF.1. Part of that decline is explained by the effect of lower oil prices, which is related mostly to the shale boom-bust cycle and accounts for about half of the investment decline between 2014 and 2017 (Figure 1.SF.6). Between 2018 and 2020, however, the energy transition expectation channel was also a factor: if public awareness of the energy transition had been the same as in 2014, "brown" investment would have been 38 percent higher in 2020. The inflows into sustainable funds (supply-side channel) show a slightly smaller effect, even though their coefficient is not significant. The demand channel (that is, CO_2 prices and greenhouse gas coverage) is not significant, because its effect is either small or already subsumed by oil prices. The pandemic has likely further penalized brown investment, probably through unprecedented uncertainty, given that 18 percent of the 2020 decline is not fully explained by the econometric model.

Supply-Side Policies Could Propel Prices

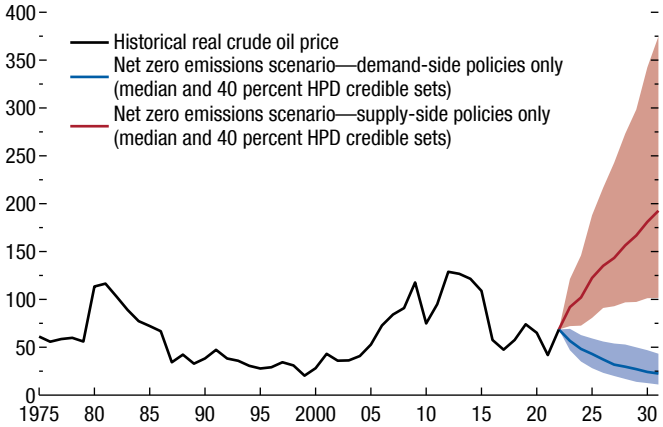
How might climate *supply*- and *demand-side* policies affect prices? It is typically assumed that the energy transition would work as a negative demand shock

Figure 1.SF.6. Counterfactuals for Oil and Gas Captial Expenditure
(Index)



Sources: Compustat; Google Trends; and IMF staff calculations.
Note: The dashed lines show in-sample scenarios for oil and gas captial expenditure in which either the oil price, the energy transition awareness proxy, or the sustainable funds inflow were held at their 2014 values.

Figure 1.SF.7. Oil Prices Rise in a Net Zero Emissions Scenario Driven by Supply Policies, Decline when Driven by Demand Policy
(US dollars a barrel)



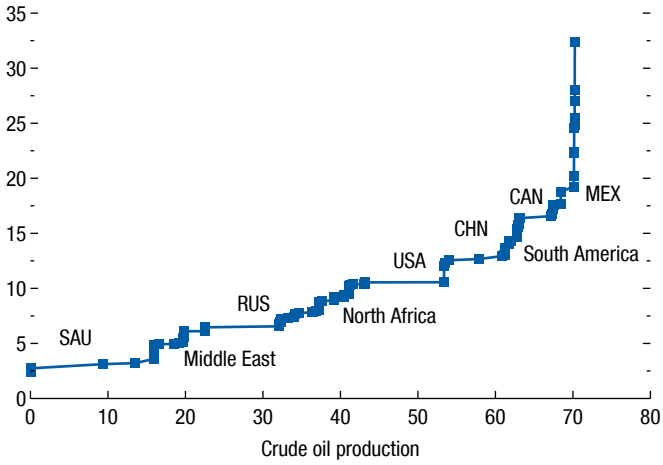
Sources: Boer, Pescatori, and Stuermer (2021); British Petroleum; International Energy Agency; Schwerhoff and Stuermer (2020); and IMF staff calculations.
Note: Brent crude oil spot prices were adjusted for inflation using the United States Consumer Price Index with the base year 2020. See Boer and others (2021) and Online Annex 1.SF.1 for underlying data and methodology. HPD = highest posterior density.

to fossil fuel prices. Subsidies for electric cars, for example, are a negative crude-oil-specific demand shock, since crude oil is replaced by electricity, leading to lower prices. However, a declining fossil fuel path can also stem from restricting investment flows into oil and gas because of sustainable investing pressures and other supply-side policies.

The case of crude oil highlights quantitatively how two different driving forces work in the International Energy Agency (2021b) Net Zero Emissions Scenario, in which crude oil production declines from 85 mb/d in 2020 to 66 mb/d in 2030. First, only demand-side policies are considered. In this hypothetical scenario, oil prices could decline to the $20s in 2030, with dire consequences for oil exporters (Figure 1.SF.7, blue line). Rents would diminish, and oil production would come under pressure in high-cost regions (Figure 1.SF.8).

Reductions in oil production that are driven hypothetically *only* by *supply-side* measures would, instead, exert strong upward pressure, taking prices to roughly $190 a barrel (Figure 1.SF.7, red line), benefiting producing countries at the expense of consuming countries. Since oil production would be profitable for all producers, the main determinants for the distribution of production and rents would be country restrictions, environmental regulations, and access to capital.

Figure 1.SF.8. Production in High-Cost Regions Would Be under Pressure in Demand-Side Scenario, Uncertain in Supply Side Scenario
(US dollars a barrel; million barrels a day)



Sources: Rystad Energy UCube; and IMF staff calculations.
Note: Production includes crude oil but excludes condensates and other liquids. The data set does not include all countries. Production costs refer to country averages. Data labels in the figure use International Organization for Standardization (ISO) country codes.

Consequently, the two hypothetical scenarios show that it is wrong to assume that fossil fuel prices will necessarily decline because of the energy transition. Instead, *supply-side* policies could exert upward price pressure, while *demand-side* policies would do the opposite. The reality is, of course, a mix of the two. If country policies are unpredictable and uncoordinated, the price effects of the energy transition are ultimately hard to determine, and this raises uncertainty.

Conclusions

Anticipation of lower fossil fuel demand and—possibly, but to a lesser extent—supply-side climate policies (including shifting public preferences for sustainable investing) have sapped capital expenditures in oil and gas globally over the past three to four years—especially for publicly traded companies, whose investment may have shrunk 20 percent during that time. This can put persistent upward pressure on oil and other fossil fuel prices, move production to less regulated producers, and add substantial uncertainty to the outlook for oil and gas prices. A coordinated climate effort among fossil fuel consumer and producer countries and divestment from fossil fuels at a pace commensurate with the speed of adoption of renewable energy would help reduce the risk of high and volatile energy prices. And less policy uncertainty would help countries make necessary adjustments.

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]		
		Projections			Projections			Projections			Projections	
	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
Europe	**5.9**	**1.1**	**1.9**	**4.9**	**12.6**	**7.5**	**3.0**	**2.0**	**2.0**	**. . .**	**. . .**	**. . .**
Advanced Europe	**5.5**	**3.0**	**2.2**	**2.6**	**5.5**	**2.7**	**3.2**	**1.8**	**2.1**	**6.9**	**6.5**	**6.4**
Euro Area[4,5]	5.3	2.8	2.3	2.6	5.3	2.3	2.4	1.8	2.2	7.7	7.3	7.1
Germany	2.8	2.1	2.7	3.2	5.5	2.9	7.4	5.9	6.9	3.5	3.2	3.2
France	7.0	2.9	1.4	2.1	4.1	1.8	–0.9	–1.8	–1.7	7.9	7.8	7.6
Italy	6.6	2.3	1.7	1.9	5.3	2.5	3.3	1.8	2.4	9.5	9.3	9.4
Spain	5.1	4.8	3.3	3.1	5.3	1.3	0.9	0.3	0.4	14.8	13.4	13.1
The Netherlands	5.0	3.0	2.0	2.8	5.2	2.3	9.5	7.4	7.3	4.2	4.0	4.0
Belgium	6.3	2.1	1.4	3.2	8.0	1.3	0.9	0.5	0.9	6.3	6.0	5.8
Ireland	13.5	5.2	5.0	2.4	5.7	2.7	13.9	10.2	8.4	6.3	6.0	5.4
Austria	4.5	2.6	3.0	2.8	5.6	2.2	–0.6	–0.6	0.8	6.2	5.2	4.9
Portugal	4.9	4.0	2.1	0.9	4.0	1.5	–1.1	–2.6	–1.4	6.6	6.5	6.4
Greece	8.3	3.5	2.6	0.6	4.5	1.3	–6.4	–6.3	–6.1	15.0	12.9	12.4
Finland	3.3	1.6	1.7	2.1	3.8	2.7	0.9	0.4	0.0	7.6	7.0	6.7
Slovak Republic	3.0	2.6	5.0	2.8	8.4	4.1	–2.0	–5.0	–4.8	6.8	6.4	6.2
Lithuania	4.9	1.8	2.6	4.6	13.3	4.3	2.7	–0.7	–2.1	7.1	7.3	7.0
Slovenia	8.1	3.7	3.0	1.9	6.7	5.1	3.3	–0.5	–1.4	4.7	4.5	4.5
Luxembourg	6.9	1.8	2.1	3.5	5.6	2.0	2.8	2.0	2.7	5.7	5.0	5.0
Latvia	4.7	1.0	2.4	3.2	10.0	3.9	–2.9	–1.6	–1.7	7.6	8.1	8.1
Estonia	8.3	0.2	2.2	4.5	11.9	4.6	–1.1	1.6	1.8	6.2	7.2	6.9
Cyprus	5.5	2.1	3.5	2.2	5.3	2.3	–7.6	–9.4	–8.3	7.5	8.5	7.5
Malta	9.4	4.8	4.5	0.7	4.7	2.8	–5.1	–1.7	–1.4	3.6	3.5	3.5
United Kingdom	7.4	3.7	1.2	2.6	7.4	5.3	–2.6	–5.5	–4.8	4.5	4.2	4.6
Switzerland	3.7	2.2	1.4	0.6	2.5	1.6	9.3	6.3	7.0	3.0	2.6	2.7
Sweden	4.8	2.9	2.7	2.7	4.8	2.2	5.5	4.9	4.4	8.8	7.8	7.2
Czech Republic	3.3	2.3	4.2	3.8	9.0	2.3	–0.8	–0.7	–1.2	2.8	2.5	2.3
Norway	3.9	4.0	2.6	3.5	3.5	1.8	15.3	19.9	16.8	4.4	3.9	3.8
Denmark	4.1	2.3	1.7	1.9	3.8	2.1	8.4	7.3	7.1	5.1	5.1	5.1
Iceland	4.3	3.3	2.3	4.5	6.9	5.5	–2.8	0.6	1.0	6.0	4.7	4.0
Andorra	8.9	4.5	2.7	1.7	2.9	1.3	15.9	16.9	17.4	2.9	2.0	1.8
San Marino	5.2	1.3	1.1	2.1	4.9	2.0	2.7	0.3	1.2	6.2	5.8	5.7
Emerging and Developing Europe[6]	**6.7**	**–2.9**	**1.3**	**9.5**	**27.1**	**18.1**	**1.7**	**3.2**	**1.7**	**. . .**	**. . .**	**. . .**
Russia	4.7	–8.5	–2.3	6.7	21.3	14.3	6.9	12.4	8.1	4.8	9.3	7.8
Turkey	11.0	2.7	3.0	19.6	60.5	37.2	–1.8	–5.7	–2.0	12.0	11.3	10.6
Poland	5.7	3.7	2.9	5.1	8.9	10.3	–0.9	–2.9	–2.7	3.5	3.2	3.0
Romania	5.9	2.2	3.4	5.0	9.3	4.0	–7.1	–7.0	–6.5	5.3	5.6	5.5
Ukraine[7]	3.4	–35.0	. . .	9.4	. . .	. . .	–1.1	. . .	. . .	9.8	. . .	. . .
Hungary	7.1	3.7	3.6	5.1	10.3	6.4	–0.9	–1.3	0.1	4.1	4.3	4.2
Belarus	2.3	–6.4	0.4	9.5	12.6	14.1	2.7	–1.2	–1.0	3.9	4.5	4.3
Bulgaria[5]	4.2	3.2	4.5	2.8	11.0	3.3	–2.0	–2.2	–2.0	5.3	4.9	4.6
Serbia	7.4	3.5	4.0	4.1	7.7	4.7	–4.4	–6.1	–5.7	10.1	9.9	9.7
Croatia	10.4	2.7	4.0	2.6	5.9	2.7	2.0	–0.4	0.3	8.2	7.7	7.4

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.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A5 and A6 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Current account position corrected for reporting discrepancies in intra-area transactions.

[5]Based on Eurostat's harmonized index of consumer prices except for Slovenia.

[6]Includes Albania, Bosnia and Herzegovina, Kosovo, Moldova, Montenegro, and North Macedonia.

[7]See the country-specific note for Ukraine in the "Country Notes" section of the Statistical Appendix.

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]		
		Projections			Projections			Projections			Projections	
	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
Asia	**6.5**	**4.9**	**5.1**	**2.0**	**3.2**	**2.7**	**2.2**	**1.5**	**1.3**	**. . .**	**. . .**	**. . .**
Advanced Asia	**3.6**	**2.8**	**2.8**	**1.2**	**2.4**	**1.7**	**5.0**	**3.8**	**3.6**	**3.4**	**3.1**	**3.0**
Japan	1.6	2.4	2.3	–0.3	1.0	0.8	2.9	2.4	2.7	2.8	2.6	2.4
Korea	4.0	2.5	2.9	2.5	4.0	2.4	4.9	2.2	3.2	3.7	3.6	3.5
Taiwan Province of China	6.3	3.2	2.9	1.8	2.3	2.2	14.7	13.2	11.6	4.0	3.6	3.6
Australia	4.7	4.2	2.5	2.8	3.9	2.7	3.5	3.0	0.5	5.1	4.0	4.3
Singapore	7.6	4.0	2.9	2.3	3.5	2.0	18.1	13.0	12.7	2.6	2.4	2.4
Hong Kong SAR	6.4	0.5	4.9	1.6	1.9	2.1	11.2	10.9	9.4	5.2	5.7	4.0
New Zealand	5.6	2.7	2.6	3.9	5.9	3.5	–5.8	–6.5	–5.3	3.8	3.6	3.9
Macao SAR	18.0	15.5	23.3	0.0	2.8	2.7	13.8	3.5	14.9	3.0	2.6	1.8
Emerging and Developing Asia	**7.3**	**5.4**	**5.6**	**2.2**	**3.5**	**2.9**	**1.0**	**0.6**	**0.4**	**. . .**	**. . .**	**. . .**
China	8.1	4.4	5.1	0.9	2.1	1.8	1.8	1.1	1.0	4.0	3.7	3.6
India[4]	8.9	8.2	6.9	5.5	6.1	4.8	–1.6	–3.1	–2.7	. . .	. . .	. . .
ASEAN-5	**3.4**	**5.3**	**5.9**	**2.0**	**3.5**	**3.2**	**–0.1**	**2.0**	**0.9**	**. . .**	**. . .**	**. . .**
Indonesia	3.7	5.4	6.0	1.6	3.3	3.3	0.3	4.5	0.5	6.5	6.0	5.6
Thailand	1.6	3.3	4.3	1.2	3.5	2.8	–2.1	–0.1	2.0	1.5	1.0	1.0
Vietnam	2.6	6.0	7.2	1.9	3.8	3.2	–0.5	–0.1	0.8	2.7	2.4	2.3
Philippines	5.6	6.5	6.3	3.9	4.3	3.7	–1.8	–2.7	–2.2	7.8	5.8	5.4
Malaysia	3.1	5.6	5.5	2.5	3.0	2.4	3.5	3.9	3.9	4.7	4.5	4.3
Other Emerging and Developing Asia[5]	**3.0**	**4.9**	**5.5**	**5.0**	**8.7**	**7.2**	**–2.5**	**–2.5**	**–2.0**	**. . .**	**. . .**	**. . .**
Memorandum												
Emerging Asia[6]	7.4	5.4	5.6	2.1	3.2	2.8	1.1	0.7	0.5	. . .	. . .	. . .

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.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A5 and A6 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]See the country-specific note for India in the "Country Notes" section of the Statistical Appendix.

[5]Other Emerging and Developing Asia comprises Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Fiji, Kiribati, Lao P.D.R., Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, Palau, Papua New Guinea, Samoa, Solomon Islands, Sri Lanka, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

[6]Emerging Asia comprises the ASEAN-5 economies, China, and India.

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]		
		Projections			Projections			Projections			Projections	
	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
North America	**5.5**	**3.6**	**2.3**	**4.7**	**7.4**	**2.9**	**–3.1**	**–3.0**	**–2.9**	**. . .**	**. . .**	**. . .**
United States	5.7	3.7	2.3	4.7	7.7	2.9	–3.5	–3.5	–3.2	5.4	3.5	3.5
Mexico	4.8	2.0	2.5	5.7	6.8	3.9	–0.4	–0.6	–0.7	4.1	4.1	3.9
Canada	4.6	3.9	2.8	3.4	5.6	2.4	0.1	1.1	–0.1	7.4	5.9	5.0
Puerto Rico[4]	1.0	4.8	0.4	2.3	4.4	3.3	. . .	. . .	. . .	7.9	6.9	7.9
South America[5]	**7.2**	**2.3**	**2.1**	**12.1**	**13.7**	**10.1**	**–2.0**	**–1.3**	**–1.4**	**. . .**	**. . .**	**. . .**
Brazil	4.6	0.8	1.4	8.3	8.2	5.1	–1.7	–1.5	–1.6	14.2	13.7	12.9
Argentina	10.2	4.0	3.0	48.4	51.7	43.5	1.3	0.5	0.4	9.3	9.2	8.1
Colombia	10.6	5.8	3.6	3.5	7.7	4.2	–5.7	–3.3	–3.4	13.7	11.9	10.6
Chile	11.7	1.5	0.5	4.5	7.5	4.5	–6.7	–4.5	–3.4	8.9	7.0	6.9
Peru	13.3	3.0	3.0	4.0	5.5	3.6	–2.8	–1.5	–1.4	10.9	9.3	8.8
Ecuador	4.2	2.9	2.7	0.1	3.2	2.4	2.5	2.9	2.5	4.2	4.0	3.8
Venezuela	–1.5	1.5	1.5	1,588.5	500.0	500.0	–1.4	9.0	6.5	. . .	. . .	. . .
Bolivia	6.1	3.8	3.7	0.7	3.2	3.6	0.5	–1.5	–2.0	5.2	4.5	4.0
Paraguay	4.2	0.3	4.5	4.8	9.4	4.5	0.8	–2.9	0.4	7.7	7.2	6.3
Uruguay	4.4	3.9	3.0	7.7	7.0	5.6	–1.9	–0.2	0.0	9.4	7.0	7.0
Central America[6]	**11.0**	**4.8**	**4.0**	**4.5**	**5.8**	**4.3**	**–1.8**	**–3.1**	**–2.5**	**. . .**	**. . .**	**. . .**
Caribbean[7]	**3.5**	**10.5**	**9.1**	**8.6**	**11.3**	**7.4**	**–5.0**	**3.1**	**3.2**	**. . .**	**. . .**	**. . .**
Memorandum												
Latin America and the Caribbean[8]	6.8	2.5	2.5	9.8	11.2	8.0	–1.6	–1.2	–1.2	. . .	. . .	. . .
Eastern Caribbean Currency Union[9]	3.4	7.6	5.5	1.5	5.0	3.4	–17.2	–17.8	–12.8	. . .	. . .	. . .

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.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A5 and A6 in the Statistical Appendix. Aggregates exclude Venezuela.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Puerto Rico is a territory of the United States, but its statistical data are maintained on a separate and independent basis.

[5]See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.

[6]Central America refers to CAPDR (Central America, Panama, and the Dominican Republic) and comprises Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[7]The 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.

[8]Latin 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.

[9]Eastern 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]		
		Projections			Projections			Projections			Projections	
	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
Middle East and Central Asia	**5.7**	**4.6**	**3.7**	**13.2**	**12.8**	**10.5**	**3.0**	**8.3**	**5.6**	**. . .**	**. . .**	**. . .**
Oil Exporters[4]	**6.5**	**5.0**	**3.3**	**11.6**	**10.9**	**8.8**	**5.1**	**12.0**	**8.5**	**. . .**	**. . .**	**. . .**
Saudi Arabia	3.2	7.6	3.6	3.1	2.5	2.0	6.6	19.5	14.8	6.7	. . .	. . .
Iran	4.0	3.0	2.0	40.1	32.3	27.5	2.0	3.5	2.0	9.8	10.2	10.5
United Arab Emirates	2.3	4.2	3.8	0.2	3.7	2.8	11.7	18.5	14.0	. . .	. . .	. . .
Kazakhstan	4.0	2.3	4.4	8.0	8.5	7.1	–3.0	3.0	0.3	4.9	4.9	4.8
Algeria	4.0	2.4	2.4	7.2	8.7	8.2	–2.8	2.9	–0.2	13.4	11.1	9.8
Iraq	5.9	9.5	5.7	6.0	6.9	4.7	5.9	15.8	10.1	. . .	. . .	. . .
Qatar	1.5	3.4	2.5	2.3	3.5	3.2	14.7	19.9	15.1	. . .	. . .	. . .
Kuwait	1.3	8.2	2.6	3.4	4.8	2.3	16.1	31.3	27.2	1.3	. . .	. . .
Azerbaijan	5.6	2.8	2.6	6.7	12.3	8.7	15.2	37.2	28.5	6.0	5.9	5.8
Oman	2.0	5.6	2.7	1.5	3.7	2.2	–3.7	5.9	5.6	. . .	. . .	. . .
Turkmenistan	4.9	1.6	2.5	15.0	17.5	10.5	2.0	5.8	5.9	. . .	. . .	. . .
Oil Importers[5,6]	**4.5**	**3.9**	**4.4**	**16.0**	**15.9**	**13.3**	**–4.0**	**–6.0**	**–5.2**	**. . .**	**. . .**	**. . .**
Egypt	3.3	5.9	5.0	4.5	7.5	11.0	–4.6	–4.3	–4.6	7.3	6.9	6.9
Pakistan	5.6	4.0	4.2	8.9	11.2	10.5	–0.6	–5.3	–4.1	7.4	7.0	6.7
Morocco	7.2	1.1	4.6	1.4	4.4	2.3	–2.9	–6.0	–4.0	11.9	11.7	11.1
Uzbekistan	7.4	3.4	5.0	10.8	11.8	11.3	–7.0	–9.5	–7.4	9.5	10.0	9.5
Sudan	0.5	0.3	3.9	359.1	245.1	111.4	–5.9	–6.6	–7.0	28.3	30.2	29.3
Tunisia[7]	3.1	2.2	. . .	5.7	7.7	. . .	–6.2	–10.1	. . .	. . .	. . .	. . .
Jordan	2.0	2.4	3.1	1.3	2.8	2.5	–10.1	–5.9	–4.6	24.4	. . .	. . .
Georgia	10.4	3.2	5.8	9.6	9.9	5.1	–9.8	–11.4	–7.5	20.3	18.5	19.2
Armenia	5.7	1.5	4.0	7.2	7.6	6.0	–2.4	–6.2	–5.9	18.5	19.5	19.0
Tajikistan	9.2	2.5	3.5	8.7	10.0	10.5	2.8	–1.4	–2.2	. . .	. . .	. . .
Kyrgyz Republic	3.7	0.9	5.0	11.9	13.2	10.1	–5.2	–12.2	–9.3	6.6	6.6	6.6
West Bank and Gaza	6.0	4.0	3.5	1.2	2.8	2.4	–12.7	–12.8	–12.4	26.4	25.7	25.0
Mauritania	3.0	5.0	4.4	3.8	4.9	4.0	–2.2	–14.0	–13.4	. . .	. . .	. . .
Memorandum												
Caucasus and Central Asia	5.6	2.6	4.2	9.2	10.7	8.6	–0.8	5.6	3.2	. . .	. . .	. . .
Middle East, North Africa, Afghanistan, and Pakistan[6]	5.7	4.8	3.7	13.8	13.1	10.8	3.3	8.5	5.8	. . .	. . .	. . .
Middle East and North Africa	5.8	5.0	3.6	14.6	13.4	10.8	3.6	9.5	6.6	. . .	. . .	. . .
Israel[8]	8.2	5.0	3.5	1.5	3.5	2.0	4.6	3.2	3.1	5.0	3.9	3.8
Maghreb[9]	22.2	2.2	3.2	5.0	6.8	5.7	–1.2	1.2	–0.6	. . .	. . .	. . .
Mashreq[10]	2.9	5.2	4.8	9.0	10.2	11.5	–5.8	–5.2	–5.2	. . .	. . .	. . .

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.

[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A5 and A6 in the Statistical Appendix.

[2]Percent of GDP.

[3]Percent. National definitions of unemployment may differ.

[4]Includes Bahrain, Libya, and Yemen.

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

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

[7]See the country-specific note for Tunisia in the "Country Notes" section of the Statistical Appendix.

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

[9]The Maghreb comprises Algeria, Libya, Mauritania, Morocco, and Tunisia.

[10]The Mashreq comprises Egypt, Jordan, Lebanon, and West Bank and Gaza. Syria is excluded because of the uncertain political situation.

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]		
		Projections			Projections			Projections			Projections	
	2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
Sub-Saharan Africa	**4.5**	**3.8**	**4.0**	**11.0**	**12.2**	**9.6**	**–1.1**	**–1.7**	**–2.5**	**. . .**	**. . .**	**. . .**
Oil Exporters[4]	**2.9**	**3.4**	**3.1**	**16.8**	**16.3**	**12.4**	**0.7**	**1.9**	**0.2**	**. . .**	**. . .**	**. . .**
Nigeria	3.6	3.4	3.1	17.0	16.1	13.1	–0.8	–1.1	–1.1	. . .	. . .	. . .
Angola	0.7	3.0	3.3	25.8	23.9	13.2	11.3	11.0	4.9	. . .	. . .	. . .
Gabon	0.9	2.7	3.4	1.1	2.9	2.6	–6.9	1.7	–0.1	. . .	. . .	. . .
Chad	–1.1	3.3	3.5	–0.8	4.1	3.1	–4.5	1.3	–2.3	. . .	. . .	. . .
Equatorial Guinea	–3.5	6.1	–2.9	–0.1	4.0	3.9	–3.4	–1.6	–2.0	. . .	. . .	. . .
Middle-Income Countries[5]	**5.0**	**3.3**	**3.3**	**5.6**	**7.2**	**5.3**	**0.6**	**–1.1**	**–2.0**	**. . .**	**. . .**	**. . .**
South Africa	4.9	1.9	1.4	4.5	5.7	4.6	3.7	1.3	–1.0	34.2	35.2	37.0
Ghana	4.2	5.2	5.1	10.0	16.3	13.0	–3.0	–3.6	–3.5	. . .	. . .	. . .
Côte d'Ivoire	6.5	6.0	6.7	4.2	5.5	2.3	–3.7	–4.8	–4.4	. . .	. . .	. . .
Cameroon	3.5	4.3	4.9	2.3	2.9	2.3	–3.3	–1.6	–2.9	. . .	. . .	. . .
Zambia	4.3	3.1	3.6	20.5	15.7	9.2	6.7	4.4	4.3	. . .	. . .	. . .
Senegal	6.1	5.0	9.2	2.2	3.0	2.2	–11.8	–13.0	–8.4	. . .	. . .	. . .
Low-Income Countries[6]	**5.6**	**4.8**	**5.6**	**11.2**	**13.6**	**11.3**	**–5.0**	**–6.5**	**–6.1**	**. . .**	**. . .**	**. . .**
Ethiopia	6.3	3.8	5.7	26.8	34.5	30.5	–3.2	–4.5	–4.4	. . .	. . .	. . .
Kenya	7.2	5.7	5.3	6.1	7.2	7.1	–5.4	–5.8	–5.3	. . .	. . .	. . .
Tanzania	4.9	4.8	5.2	3.7	4.4	5.4	–3.3	–4.3	–3.6	. . .	. . .	. . .
Uganda	5.1	4.9	6.5	2.2	6.1	4.1	–7.9	–7.0	–9.8	. . .	. . .	. . .
Democratic Republic of the Congo	5.7	6.4	6.9	9.0	6.4	6.1	–1.0	–0.3	–0.3	. . .	. . .	. . .
Burkina Faso	6.9	4.7	5.0	3.9	6.0	2.0	–3.1	–5.7	–5.3	. . .	. . .	. . .
Mali	3.1	2.0	5.3	4.0	8.0	3.0	–4.5	–5.3	–4.9	. . .	. . .	. . .

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.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Table A6 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]Includes Republic of Congo and South Sudan.
[5]Includes Botswana, Cabo Verde, Eswatini, Lesotho, Mauritius, Namibia, and Seychelles.
[6]Includes Benin, Burundi, Central African Republic, Comoros, Eritrea, The Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mozambique, Niger, Rwanda, São Tomé and Príncipe, 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	
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
World	**2.5**	**2.1**	**2.1**	**1.8**	**2.5**	**2.4**	**1.7**	**–4.2**	**5.4**	**2.8**	**2.5**
Advanced Economies	**1.0**	**1.5**	**1.7**	**1.3**	**2.0**	**1.9**	**1.3**	**–5.0**	**5.0**	**3.0**	**2.1**
United States	0.9	1.6	2.0	0.9	1.6	2.4	1.8	–4.2	5.4	3.3	1.8
Euro Area[1]	0.5	1.2	1.7	1.6	2.4	1.6	1.3	–6.7	5.3	2.7	2.2
Germany	1.4	1.8	0.6	1.4	2.3	0.8	0.8	–4.6	2.7	2.0	2.6
France	0.6	0.5	0.6	0.8	2.2	1.5	1.4	–8.3	6.7	2.7	1.1
Italy	–0.9	–0.1	0.9	1.5	1.8	1.1	0.7	–8.8	7.4	2.4	1.7
Spain	–0.4	1.7	3.9	2.9	2.8	1.9	1.3	–11.3	5.0	4.4	2.9
Japan	0.7	0.5	1.7	0.8	1.8	0.8	0.0	–4.2	1.9	2.7	2.8
United Kingdom	0.5	2.2	1.8	1.4	1.5	1.0	1.1	–9.7	6.7	3.3	0.8
Canada	0.9	1.8	–0.1	0.0	1.8	1.4	0.4	–6.4	3.9	2.7	1.7
Other Advanced Economies[2]	2.6	2.2	1.5	1.8	2.5	2.0	1.3	–2.4	5.1	2.8	2.5
Emerging Market and Developing Economies	**4.7**	**3.1**	**2.8**	**2.8**	**3.3**	**3.3**	**2.4**	**–3.3**	**5.9**	**2.7**	**3.3**
Emerging and Developing Asia	7.3	5.8	5.9	5.8	5.7	5.6	4.4	–1.5	6.5	4.7	5.0
China	9.7	6.7	6.5	6.2	6.4	6.3	5.6	2.1	8.0	4.4	5.1
India[3]	6.2	6.2	6.8	7.1	5.7	5.4	2.6	–7.3	7.9	7.1	5.9
ASEAN-5[4]	4.0	3.4	3.7	3.9	4.3	4.3	3.7	–4.5	2.5	4.3	4.9
Emerging and Developing Europe	4.1	1.5	0.5	1.6	3.9	3.3	2.4	–1.7	6.7	4.0	0.8
Russia	4.2	–1.1	–2.2	0.0	1.8	2.9	2.2	–2.3	5.1	–8.5	–2.2
Latin America and the Caribbean	2.7	0.1	–0.8	–1.9	0.3	0.2	–1.3	–8.1	5.9	1.7	1.6
Brazil	3.0	–0.4	–4.4	–4.1	0.5	1.0	0.4	–4.6	4.2	0.2	0.8
Mexico	0.8	1.6	2.1	1.5	1.0	1.1	–1.2	–9.0	3.8	1.1	1.6
Middle East and Central Asia	2.2	0.6	0.5	1.0	–0.3	0.5	0.2	–5.0	6.1	2.7	1.9
Saudi Arabia	1.3	2.5	1.7	–0.6	–3.3	0.1	–2.0	–6.3	1.9	5.5	1.6
Sub-Saharan Africa	2.7	2.3	0.5	–1.2	0.3	0.6	0.4	–4.3	1.9	1.2	1.4
Nigeria	4.5	3.5	0.0	–4.2	–1.8	–0.7	–0.4	–4.3	1.1	0.9	0.6
South Africa	1.9	–0.1	–0.2	–0.8	–0.3	0.0	–1.3	–7.8	4.0	0.4	–0.1
Memorandum											
European Union	0.9	1.5	2.1	1.9	2.8	2.1	1.8	–6.1	5.4	2.7	2.4
Middle East and North Africa	1.6	0.0	0.2	2.1	–1.0	0.0	–0.2	–5.5	2.5	3.1	1.8
Emerging Market and Middle-Income Economies	4.9	3.2	3.0	3.1	3.5	3.6	2.5	–3.2	6.1	3.1	3.5
Low-Income Developing Countries	3.6	3.8	2.2	1.5	2.6	2.7	2.9	–2.1	2.5	2.4	3.1

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.

[1]Data calculated as the sum of individual euro area countries.

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

[3]See the country-specific note for India in the "Country Notes" section of the Statistical Appendix.

[4]ASEAN-5 comprises Indonesia, Malaysia, Philippines, Thailand, Vietnam.

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CHAPTER 2

PRIVATE SECTOR DEBT AND THE GLOBAL RECOVERY

During the pandemic, and in particular its most acute phase, government policies helped maintain private access to credit, staving off a deeper recession in 2020. This chapter examines whether the resulting increase in leverage may affect the pace of the recovery. On average, the drag on future GDP growth is estimated at 0.9 percent over three years for advanced economies and at 1.3 percent for emerging markets. However, analyses based on micro-level data show that the recovery is likely to be slower in countries where (1) leverage is concentrated among vulnerable firms and low-income households, (2) insolvency procedures are inefficient, (3) public and private deleveraging coincide, and (4) monetary policy must be tightened rapidly. As countries prepare to normalize monetary policy, assessing how leverage is distributed is key to forecasting the pace of the recovery and calibrating the unwinding of pandemic-time support. In some advanced economies where the recovery is well underway and private balance sheets are in good shape, fiscal support can be reduced faster, facilitating the work of central banks. Elsewhere, targeted fiscal support—within the limit of a credible medium-term fiscal framework—could be relied on to minimize the risk of disruptions and scarring.

Introduction

Accommodative policies during the acute phase of the COVID-19 crisis mitigated its overall economic cost by providing ample and cheap liquidity to affected households and firms. But these policies also led to rapid debt buildup, extending a steady rise in overall leverage encouraged by supportive financial conditions since the global financial crisis of 2008. The surge in global *private* debt in 2020—13 percent of GDP—was widespread, faster than during the global financial crisis and almost as large as the rise in public debt (Figure 2.1, panel 1). Nonfinancial corporations, which entered the pandemic with already-elevated debt (*Global Financial Stability Report* [GFSR], April and October 2021), saw larger increase in debt ratios than households. This was especially the case in advanced economies thanks to extensive credit guarantees, concessional lending programs, and moratoriums (Figure 2.1, panel 2).

Will these developments have a bearing on the nature of the recovery that lies ahead? After all, one person's debt is another person's asset, so why should it matter?

Answers to these questions require delving deep into why private debt matters. *First*, it matters because debtors and creditors are not alike.[1] Borrowers are typically constrained financially, with the severity of the constraint depending on the financial resources at their command. High-net-worth, liquid households and firms can sustain large variations in indebtedness with minor consequences for spending; higher debt often finances the accumulation of assets that can later be drawn down to finance consumption or investment. Low-net-worth, illiquid households and firms, on the other hand, are more constrained. They are also more sensitive to leverage cycles and more reactive to changes in fiscal and monetary policies. Such distinction is particularly relevant if rising interest rates lead to conditions and financial instability (April 2022 GFSR and Chapter 1).

Second, periods of rapidly increasing debt may become unsustainable and lead to periods of deleveraging accompanied by subpar growth. In a nutshell, loose financial conditions encourage debt buildup, which boosts spending, growth, and asset prices and further incentivizes credit as collateral values increase. This eventually unwinds when returns disappoint or are too poor to justify further debt-financed investment, lenders become wary of rolling over credit and extending new loans, or financial conditions tighten and rising debt-service costs crowd out other spending.

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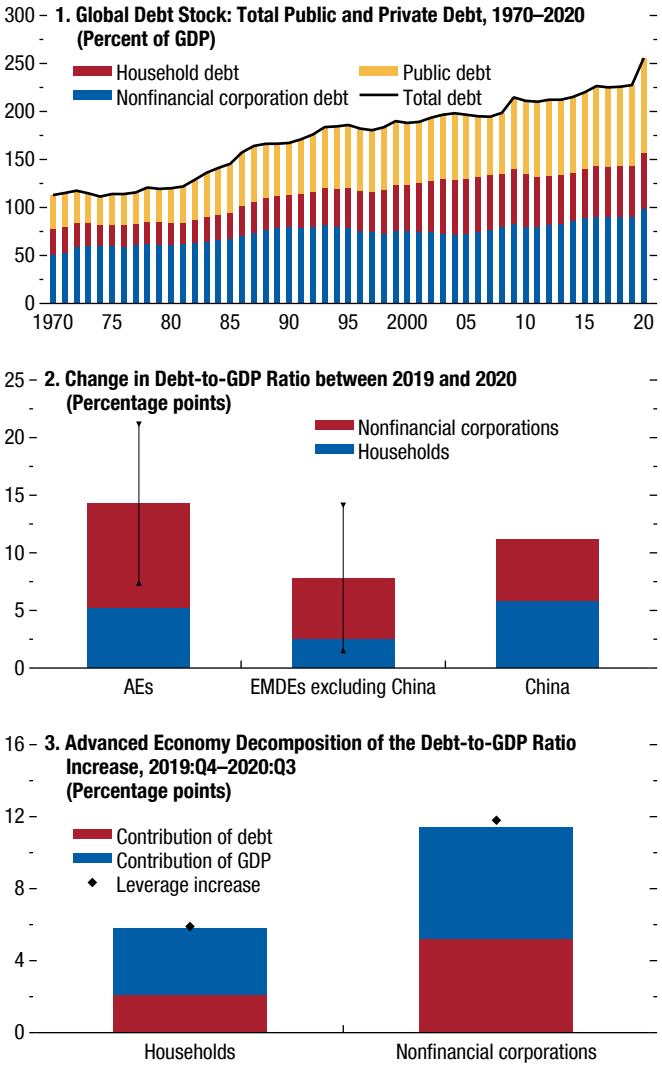
[1]Tobin (1980) argues that "the population is not distributed between debtors and creditors randomly. Debtors have borrowed for good reasons, most of which indicate a high marginal propensity to spend from wealth or from current income or from any other liquid resources they can command."

Figure 2.1. Rapidly Mounting Private Debt

Private debt increased as much as public debt in 2020. The largest increases took place in advanced economies, with large variations across countries.



Sources: Gaspar, Medas, and Perrelli (2021); IMF, Global Debt Database; and IMF staff calculations.
Note: In panel 1, public debt refers to the largest category of debt available (nonfinancial public sector, general government, and central government, in decreasing order). Private debt (households and nonfinancial corporations) includes only loans and securities. Total debt (as a percent of GDP) is close but not exactly equal to the sum of the components of public and private debt. This is because of the difference in country coverage for the corresponding variables, which causes the corresponding country weights to differ. In panel 2, whiskers show one standard deviation for private debt. AEs = advanced economies; EMDEs = emerging market and developing economies.

Third, national circumstances are also important. Countries with limited fiscal space may find it difficult to support domestic demand; public and private sector deleveraging may occur simultaneously, compounding the drag on growth. In countries where debt restructuring or business liquidation is required, the efficiency of the insolvency framework may play an important role in reallocating capital to productive uses. The strength of the recovery will also critically hinge on the strength of financial intermediaries. Following monetary tightening, deleveraging pressures may be stronger where macroprudential instruments are ineffective[2] and especially in countries where the health of the sovereign and banking sectors is closely intertwined (April 2022 GFSR, Chapter 2).

As governments are exiting pandemic-time emergency policies, the burden of debt is among the key challenges on the horizon. This chapter aims to answer two sets of questions:

- *Will the pandemic's private debt legacy affect the pace of the recovery*? How large a drag could there be on future private consumption and investment? Does it depend on the distribution of debt across households and firms? On available fiscal space? On the solvency framework?
- *What are the main implications for economic policy?* Does a high level of private debt, or its distribution across households and firms, affect the transmission and effectiveness of countercyclical policies? What does this imply for the pace of normalization and consolidation during the recovery, and what should the policy mix look like?

The main findings are summarized as follows:

Pandemic debt buildup: Nonfinancial corporate debt surged among vulnerable firms (high leverage, low liquidity, low profitability) in the worst-hit sectors (for example, those that are contact intensive). Household debt accumulation, although more modest than that of nonfinancial corporations overall, was in some cases heavily concentrated among low-income households. Differences across countries are large, with important implications for future growth.

[2]For an analysis of the implications of private sector leverage buildup for macro-financial stability risks and the role of macroprudential policy, see Barajas and others (2021).

Leverage cycles, heterogeneity, and future growth: Current levels of private leverage are expected to exert some drag on future GDP growth. Estimates based on cross-country aggregate data point to a cumulative 0.9 percent slowdown over three years for advanced economies and a cumulative 1.3 percent slowdown for emerging markets. However, the post-pandemic drag on growth could be much larger in countries where (1) indebtedness is more concentrated among financially constrained households and vulnerable firms, (2) the insolvency regime is inefficient, (3) fiscal space is limited, and (4) monetary policy needs to be tightened rapidly. For example, a surprise tightening of 100 basis points is estimated to slow investment among highly leveraged firms by a cumulative 6½ percentage points over two years, 4 percentage points more than among those with little leverage. The effect could be larger if higher interest rates lead to financial instability (April 2021 GFSR).

Implications for policy: Stronger emphasis on distributional considerations for macroeconomic forecasting and policymaking is needed. For example, where the recovery is well underway and private balance sheets are in good shape—mainly in advanced economies that benefited from generous government support during the pandemic—fiscal support can be reduced faster, facilitating the work of central banks. Elsewhere, the recovery may be weaker, and targeted fiscal support could help lessen the risks of disruptions and scarring within credible medium-term fiscal frameworks (April 2022 *Fiscal Monitor*). Where targeting is difficult and fiscal space limited, countries may need to consider revenue-enhancing measures to fund various priorities. Increasing tax compliance and other reforms to modernize business taxation are possible avenues; the latter could include temporary increases in corporate income tax designed to capture pandemic-related excess profits (IMF 2021a).

This chapter builds on earlier IMF work (April 2021 GFSR; April 2012 and April 2020 *World Economic Outlook* [WEO]; October 2020 *Regional Economic Outlook: Europe*; October 2020 *Regional Economic Outlook: Western Hemisphere*) and draws on two strands of literature that emphasize the importance of *heterogeneity* (Jappelli and Pistaferri 2014; Cloyne and others 2018; Kaplan, Moll, and Violante 2018; Ottonello and Winberry 2020) and *leverage* (Bernanke, Gertler, and Gilchrist 1999; Iacoviello 2005; Eggertsson and Krugman 2012; Jordà, Schularick, and Taylor 2011; Dell'Ariccia and others 2016; Mian, Sufi, and Verner 2017; Drehman, Juselius, and Korinek 2017) in the transmission and amplification of economic shocks and policy.

The chapter starts by highlighting recent developments in households' and nonfinancial corporations' balance sheets, focusing on the distribution of debt. Cross-country panel regressions estimate the macroeconomic impact of leverage buildup on future growth. Micro-level data on households and firms then help unpack the role of heterogeneity and the importance of countercyclical and structural policy.

Private Sector Leverage during the Pandemic

This section sheds light on the historical development of household and corporate balance sheets, focusing on the COVID-19 recession and buildup of leverage among heterogeneous households and firms.

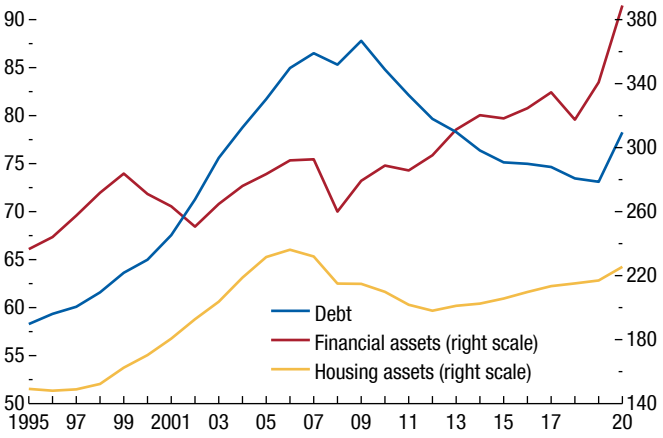
Household Balance Sheets

A Global Cycle in Assets and Liabilities

Household balance sheets have expanded almost continuously in recent decades, with net wealth increasing globally from an average 225 percent of GDP in 1995 to more than 360 percent of GDP in 2020, in purchasing-power-parity-weighted terms. Nevertheless, household debt has passed through two distinct phases over the past two decades. Among advanced economies, household leverage increased steadily in the years before the global financial crisis. Since debt was used primarily to finance housing investment, this resulted in assets growing in tandem with liabilities (Figure 2.2). In the decade after the global financial crisis, households gradually reduced debt relative to income, and housing assets also fell relative to income, with the reductions driven by lower valuations and slower investment. Household debt jumped in 2020 because of increased borrowing and lower income as a result of the pandemic-induced recession. This rise in debt was accompanied by a large increase in financial assets. Looking ahead, net wealth could contract again as governments' cash transfers to households stop, and tighter financial conditions may increase debt-service costs and lead to declines in asset prices (see the April 2022 GFSR).

Figure 2.2. Advanced Economies: Aggregate Household Balance Sheets
(Percent of GDP)

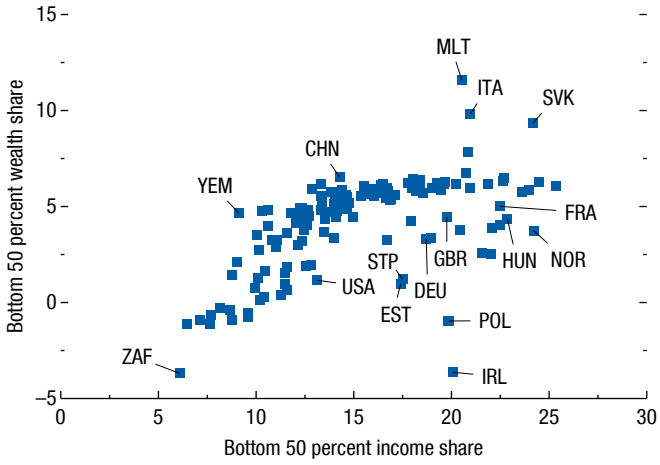
Household indebtedness jumped in 2020, after a decade of consolidation following the global financial crisis.



Sources: IMF, Global Debt Database; World Inequality Database; and IMF staff calculations.
Note: See Online Annex 2.1 for the list of countries included.

Figure 2.3. Correlation between Wealth and Income Inequality
(Percent)

Countries where household incomes are more unequal also tend to have more wealth inequality.



Sources: World Inequality Database; and IMF staff calculations.
Note: See Online Annex 2.1 for the list of countries included. Shares by country represent averages over the period from 2010 to 2020. Data labels in the figure use International Organization for Standardization (ISO) country codes.

Household Debt across the Income Distribution

It is important to look beyond aggregate figures, as these can mask important heterogeneity, especially given the high degree of inequality in household income and wealth. How debt is distributed and changes over time has implications for liquidity constraints as well as for future saving rates. For instance, a debt buildup at the lower end of the income distribution, where net wealth is typically lower, is more likely to slow future consumption when financial conditions are tightened, borrowing costs increase, and asset prices decline (Figure 2.3).

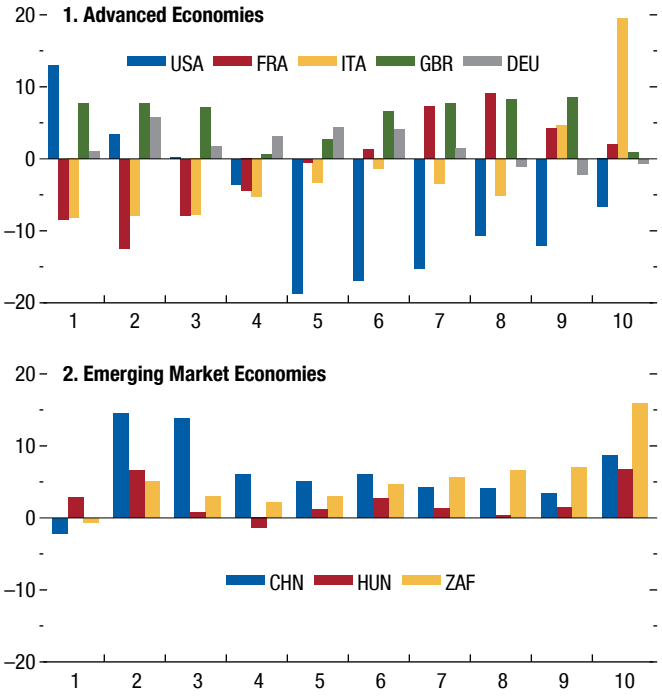
Measuring how debt varies across income groups is challenging, as it requires household wealth surveys, which are available only for a handful of countries and are conducted relatively infrequently. To estimate the impact of the COVID-19 recession on household indebtedness, a "nowcasting" approach is used that relies on macroeconomic and financial variables to extrapolate microdata on income and debt. Regional and sectoral data for value added, wages, employment, unemployment, house prices and sales, and bank lending are used to estimate changes in income and debt for households. The algorithm employed also constrains the nowcast distributions to match published aggregate household income and debt for 2020.[3]

Changes in household indebtedness varied across countries and income levels during the first year of the pandemic. The bar charts in Figure 2.4 show that aggregate statistics conceal important dimensions of debt accumulation. Among selected countries, the nowcasting estimates show that China and South Africa had the largest and broadest increases in debt ratios. The increases amounted to 5.7 percent of annual income on average across income deciles for China and 4.5 percent for South Africa. Lower-income households saw larger increases in China (except those in the bottom decile). In South Africa, the richest households saw the largest relative surge in debt, amounting to 15 percent of their annual incomes.

[3]The approach by DiNardo, Fortin, and Lemieux (1996) is used to nowcast joint distributions. This involves reweighting kernel densities and using regression adjustment to match changes in distributions over time. Income and debt distributions are nowcast for China, France, Germany, Hungary, Italy, South Africa, and the United Kingdom. For the United States, income and debt distributions are estimated using microdata from the 2019 and 2020 waves of the Consumer Expenditure Survey. See Online Annexes 2.1 and 2.2.

Figure 2.4. Change in Debt-to-Income Ratio by Income Decile in 2020
(Percent of income)

Household indebtedness varied across countries and household income groups.



Source: IMF staff calculations.
Note: Income deciles on *x*-axes, except for the United States where households are grouped by fixed income bands. See Online Annex 2.1. CHN = China; DEU = Germany; FRA = France; GBR = United Kingdom; HUN = Hungary; ITA = Italy; USA = United States; ZAF = South Africa.

Despite smaller aggregate increases in debt ratios in Germany, the United Kingdom, and Hungary and even outright decline in the United States, low-income households saw comparatively larger increases in debt. The buildup exceeded 10 percent of income in the United States for households with incomes below $15,000. In the United Kingdom, debt increased by about 7.5 percent of income for households in the lowest tercile. In contrast, France and Italy were able to support low- and middle-income households' balance sheets, as seen from the decline in debt ratios in both countries for the bottom 50 percent of incomes.

This exercise is possible only for the small number of countries that conducted household wealth surveys in the past. As attention to inequality and distributional issues increases, the expansion of data collection on household balance sheets will allow a better understanding of the impact of shocks and policies.

Firms' Balance Sheets

Concentrated Vulnerabilities in the Nonfinancial Corporate Sector

Abundant liquidity support through loans, credit guarantees, and moratoriums on debt repayment contributed to debt buildup and was pivotal in preventing widespread corporate failures and related employment and output losses, especially among small and medium enterprises. The analysis here takes stock of balance sheet developments since the pandemic began, with a focus on the distribution of leverage and vulnerabilities across firms, sectors, and countries.

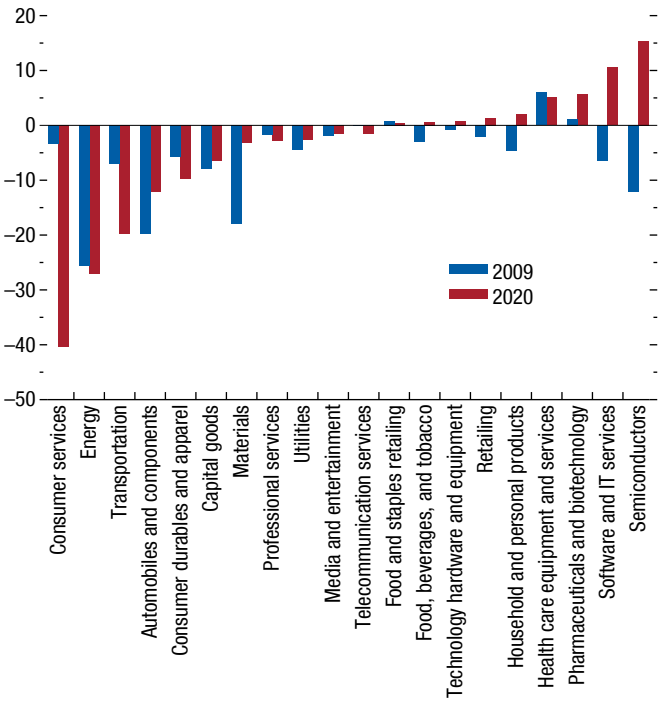
Figure 2.5 uses publicly listed firms' quarterly balance sheets[4] to present revenue growth by sector across 71 advanced and emerging market economies in 2020 and compares this with 2009, at the height of the global financial crisis. A clear sectoral contrast emerges. Because of lockdowns or materials shortages, the largest losses are concentrated in a few sectors, such as consumer services, transportation, automobiles, and components. In contrast, at the other end of the distribution, some sectors gained from the structural pivot imposed by the pandemic (semiconductors, software and information technology [IT] services, pharmaceuticals and biotechnology, and health care equipment and services). This is different from what took place during the global financial crisis, when the shock hit almost all the sectors considered. Moreover, a substantial part of the increase in leverage during the pandemic was covered by government guarantees.[5] Therefore, the risk of an adverse feedback loop in which corporate distress puts stress on the financial system—and eventually the public purse—appears smaller, at least in countries where the government can absorb the shock (Chapter 2 in the April 2022 GFSR analyzes risks associated with the sovereign-bank nexus in emerging markets). Figure 2.6 suggests that the biggest commitments were made in advanced economies, where fiscal space is the largest (see Box 2.1). However, it is worth noting that regulatory forbearance may have masked the real extent of losses.

[4]Standard & Poor's Capital IQ data are used in the whole subsection for their timeliness. But since they only comprise firms listed on stock exchanges, they cover only 7 percent of total employment. This suggests the reported share of firms in the worst-hit sectors should be considered a lower bound given that small and medium enterprises, which account for large labor and value-added shares in some of the economies, are not included in the sample. See Online Annex 2.1 for details.

[5]The share of those guarantees in total credit is highly variable, ranging from about 20 percent of all new credit in Germany to 100 percent (up to a certain limit) in Japan.

Figure 2.5. Uneven COVID-19 Impact on Nonfinancial Corporations' Revenue Growth
(Percent)

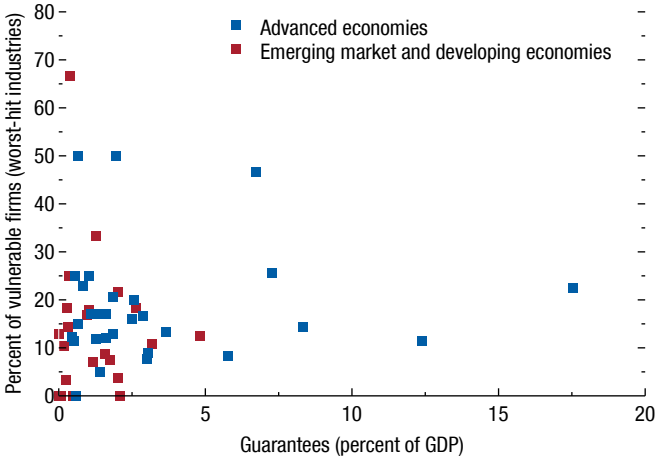
For nonfinancial corporations, a clear sectoral divergence between winners and losers emerged, which was not so pronounced in the global financial crisis.



Sources: Standard & Poor's Capital IQ; and IMF staff calculations.
Note: The sample consists of 71 countries; see Online Annex 2.1. The figure shows asset-weighted medians for annual revenue growth in 2009 (blue bars) and 2020 (red bars). IT = information technology.

Figure 2.6. Exposure to Contingent Liabilities Associated with Credit Guarantees (50 Percent Scenario)

A combination of high vulnerabilities and generous guarantees is concentrated in advanced economies.



Sources: IMF, COVID-19 Policy Tracker; Standard & Poor's Capital IQ; and IMF staff calculations.
Note: Actual data on take-up rates of government guarantees are not available for most countries. The figure displays governments' exposures in a scenario in which it is assumed that 50 percent of the announced guarantees are contracted. The share of vulnerable firms refers to the mean share of firms in the worst-hit industries in 2021 that were in the top tercile of the debt-to-asset ratio and the bottom tercile of the returns on assets distribution and had an interest coverage ratio of less than 1.

Higher Leverage for Vulnerable Firms, Especially in Worst-Hit Sectors

Leverage by sector group: Based on Figure 2.5, sectors can be grouped into three clusters: the worst-hit industries (the five sectors experiencing the strongest drop in revenue growth in 2020), the least-hit industries (the five sectors experiencing the highest revenue growth), and the middle ones as a residual category. Leverage, defined as firms' debt-to-asset ratio, increased during the pandemic in the worst-hit industries. As of the second quarter of 2021 (the latest data point available), it remained well above precrisis levels (Figure 2.7, panel 1). Net debt (gross debt net of cash holdings) also increased substantially in vulnerable firms in the worst-hit sectors, especially in emerging markets (Figure 2.7, panel 2). This is in stark contrast to what took place in other sectors that deleveraged during the pandemic, reflecting both higher assets and lower liabilities.

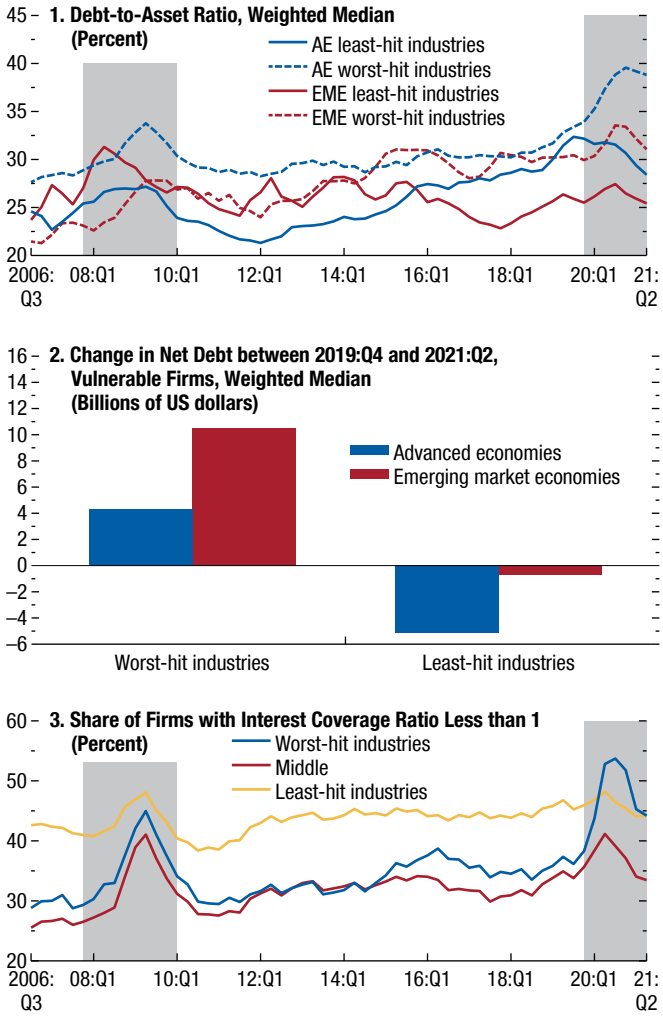
Assessing the debt burden: Debt accumulation may not be detrimental in itself: a highly indebted firm might still have a healthy balance sheet—as reflected in ample liquid asset holdings and high profits. In contrast, a firm's capacity to invest, innovate, and grow may be compromised if high leverage is coupled with profitability so low that the firm cannot make interest payments; in that case, the interest coverage ratio is less than 1. In the worst-hit industries, profitability dropped to levels comparable to those during the global financial crisis and has not yet recovered completely. This reflects both earning losses (before interest and taxes) and higher interest rate payments. The share of firms in worst-hit sectors with an interest coverage ratio of less than 1 has yet to revert to its pre-pandemic level (Figure 2.7, panel 3).

Vulnerable firms are defined as nonfinancial corporations with high leverage, low profitability, and an interest coverage ratio less than 1.[6] Not only are

[6]Since this analysis considers the distribution of leverage and return on assets by sector, high leverage is defined as that above the average threshold of the top tercile across industries (35 percent) and low profitability as that below the average of the bottom tercile of return on assets (0.2 percent).

Figure 2.7. Heterogeneous Effect on Nonfinancial Corporation Balance Sheets

The pandemic exacerbated weak balance sheet positions only in the worst-hit industries.



Sources: Standard & Poor's Capital IQ; and IMF staff calculations.
Note: Sample consists of 71 economies; see Online Annex 2.1. Panels 1 and 3 show a three-quarter moving average; shaded areas indicate the global financial crisis and COVID-19. Vulnerable firms have an interest coverage ratio of less than 1 and are in the top tercile of the debt-to-asset ratio distribution and the bottom tercile of the return on assets distribution. Net debt = total liabilities net of cash and equivalents. AE = advanced economy; EME = emerging market economy.

unprofitable indebted firms with low liquidity more exposed to potential asset repricing (Ding and others 2021) and the withdrawal of policy support, but they are also more likely to underinvest (Albuquerque 2021). Eighteen months into the pandemic, the share of vulnerable firms remained higher than in the global financial crisis and concentrated in the worst-hit sectors, where indebtedness was also relatively higher (Figure 2.8, panels 1 and 2). This share has declined since its peak at the end of 2020, however, reflecting higher returns, better cash flows, and lower debt.

How macroeconomically relevant is all this? Figure 2.8, panel 3, shows the 2020 share of vulnerable firms by sector with regard to their contribution to countries' value added. One of the worst-hit sectors, consumer services (including tourism, recreation, entertainment, and education), accounted for almost 10 percent of value added and comprised about 30 percent of vulnerable firms. Both are sizable shares.[7] Overall, worst-hit industries represented 18 percent of value added and a quarter of the labor force.[8]

Extraordinary measures to cushion the impact of the pandemic on firms' cash flow have helped prevent corporate failures. Government credit guarantees have helped ensure broad access to credit and have protected bank balance sheets. Whether this extra leverage will affect investment remains uncertain. It will depend on (1) the strength of the recovery, especially in worst-hit sectors, and (2) the tightness of future financial conditions as monetary policy is normalized (Gourinchas and others 2020, 2021; Cros, Epaulard, and Martin 2021).

Private Debt and the Business Cycle

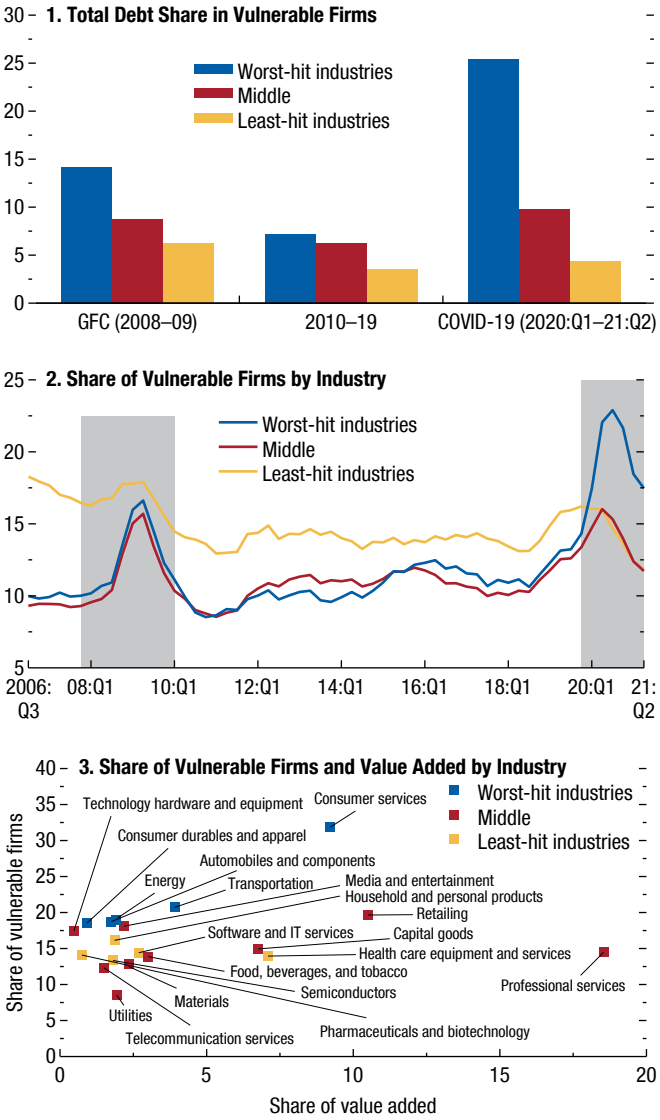
The leverage buildup during the 2020 recession can be seen as an efficient reaction to the pandemic, perceived as a temporary shock. However, it led to large increases in the private-debt-to GDP ratio that are liable to affect future consumption and investment. This section quantifies the implications of leverage buildup for growth. In line with recent literature, it shows the quantitative importance of leverage cycles

[7]Note that these vulnerabilities may be underestimated, since the stylized facts presented are based on data for listed firms, which are on average larger and less represented in worst-hit sectors than small and medium enterprises, as well as less likely to experience distress (Carletti and others 2020; Díez and others 2021).

[8]Value-added and employment figures are based on the Organisation for Economic Co-operation and Development (OECD) STAN STatistical ANalysis Database and are available with a detailed sector breakdown only for Austria, Colombia, the Czech Republic, Finland, Greece, Iceland, Mexico, the Netherlands, New Zealand, the Republic of Korea, the Slovak Republic, Sweden, Turkey, and the United States.

Figure 2.8. Concentration of Nonfinancial Corporation Vulnerabilities
(Percent)

Vulnerable firms hold a higher share of debt, are concentrated in the hard-hit industries, and are macroeconomically relevant.



Sources: Organisation for Economic Co-operation and Development; STructural ANalysis database; Standard & Poor's Capital IQ; and IMF staff calculations.
Note: Sample consists of 71 economies in panels 1 and 2 and 14 economies for which an adequate sectoral breakdown of the value-added data is available in panel 3; see Online Annex 2.1. Vulnerable firms have an interest coverage ratio of less than 1 and are in the top tercile of the debt-to-asset ratio distribution and the bottom tercile of the return on assets distribution. Panel 2 shows a three-quarter moving average; shaded areas indicate the global financial crisis and COVID-19. Panel 3 shows the share of vulnerable firms in each sector in 2020 and value added corresponding to these sectors as a percent of total value added in these economies in 2019. GFC = global financial crisis.

for growth forecasting.[9] It first documents empirical regularities based on cross-country aggregate data and then digs deeper into the mechanism, highlighting the importance of heterogeneity in the financial situations of households and firms.

Output Responses to Deleveraging Pressures

Cross-Country Evidence

Following a buildup of private-debt-to-GDP ratios over and beyond what a smooth trend would predict—defined as *excess credit*—output growth typically slows as firms and households reduce debt. Local projections, as in Jordà (2005), depict the dynamic responses of output, with all else kept constant.[10] The empirical approach relies on a panel of macroeconomic data for 43 countries (27 advanced economies and 16 emerging market and developing economies) over 52 years from 1969 to 2020 (see Online Annex 2.4).[11] For households, a 1 percentage point change in the excess-credit-to-GDP ratio results in a persistent decline in private consumption of 0.5 percent in advanced economies and 2 percent in emerging market and developing economies five years later. Nonfinancial corporate credit swings induce a similar investment response.[12] Both consumption (following excess household credit) and investment (following excess nonfinancial corporate credit) decline substantially more in emerging market and developing economies (Figure 2.9).

[9]Mian, Sufi, and Verner (2017) show that professional economic forecasters systematically overpredict GDP growth at the end of household debt buildup cycles. A rise in household debt over the three years preceding a forecast helps predict growth-forecasting errors.

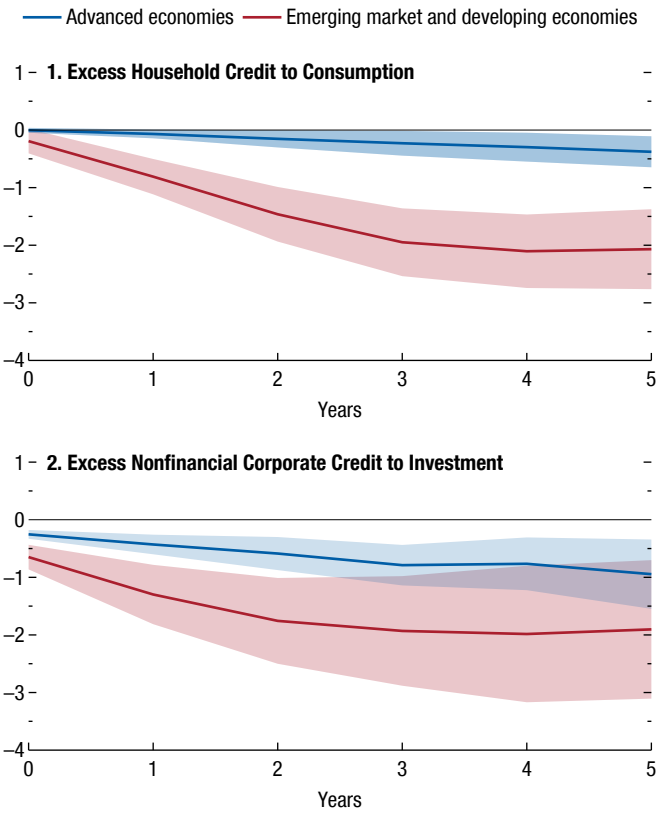
[10]To focus on large and persistent credit cycles, excess credit is defined as the three-year trailing average of the cyclical component of the Hamilton (2018) filter of private-debt-to-GDP ratios.

[11]Because the impact of leverage buildup on future growth might be different in different parts of the cycle, the local projection introduces time fixed effects. These make it possible to control for business cycle and other time-varying influences common to all countries in the sample. Country fixed effects control for country-specific factors. Potential idiosyncratic effects specifically related to the presence of public guarantees are not taken into account. The implications for future growth are uncertain and depend in part on governments' propensity and capacity to forgive or restructure those debts before the guarantees need to be activated. In the worst-case scenario of limited fiscal and monetary space and a large bank-sovereign nexus, activating public guarantees could even lead to doom loops (April 2022 GFSR).

[12]The total effect on output will be smaller, because the share of investment is smaller than the share of consumption in output and because of the generally larger share of imported input in investment.

Figure 2.9. Consumption and Investment Responses to Household and Nonfinancial Corporate Excess Credit
(Cumulative percentage points)

Excess private credit buildup affects consumption and investment more strongly in emerging market and developing economies.



Sources: Bank for International Settlements; and IMF staff calculations.
Note: Panel 1 shows the impact of a 1 percentage point increase in the three-year trailing average excess-household-credit-to-GDP ratio on cumulative consumption growth. Panel 2 shows the impact of a 1 percentage point increase in the three-year trailing average excess-nonfinancial-corporate-credit-to-GDP ratio on cumulative investment. Jordà (2005) impulse response functions. Shaded areas represent 90 percent confidence intervals.

Wide heterogeneity is seen across different economies, but at face value these estimates would imply a slower recovery by a cumulative 0.9 percent of GDP over the next three years for advanced economies and 1.3 percent for emerging market economies (excluding China) as households and nonfinancial corporations reduce debt following the recent surge.[13] These are estimates of averages based on cross-country aggregate data.[14] The forces of deleveraging and the impact on growth could be stronger for countries with debt more concentrated among financially constrained households and vulnerable firms, where fiscal space is limited, the insolvency regime is inefficient, and inflation is high (requiring tighter financial conditions). The mechanisms in play are unpacked in the following subsections; they may explain some of the differences between emerging markets and advanced economies.[15]

Private and Public Debt Interactions

The rise in private debt during the COVID-19 pandemic was accompanied by a substantial increase in public debt. The latter rose by almost 15 percent of GDP in 2020, and uncertainties remain about contingent claims and the ultimate guarantor of much of the private debt buildup (see the April 2022 *Fiscal Monitor* for more details).

Excess credit and subsequent deleveraging are expected to have a larger negative effect on output where governments struggle to mitigate the drag through public spending—that is, those with limited fiscal space.[16]

Using the same framework as in the previous subsection, this subsection explores the question within advanced economies and emerging market and developing economies by using quartiles of a fiscal position indicator by year to compare the dynamic responses of GDP following excess household credit (see Online Annex 2.4). Figure 2.10 contrasts countries in the two groups with fiscal positions that are relatively strong versus those that are fairly weak. It shows that dynamic responses of future aggregate output to private debt buildup are substantially more negative in countries with weak fiscal positions; they are larger by orders

[13]China is excluded from this estimate because it is not in the same cyclical position. Deleveraging of nonfinancial corporations started a few years ago, likely already dampening growth.

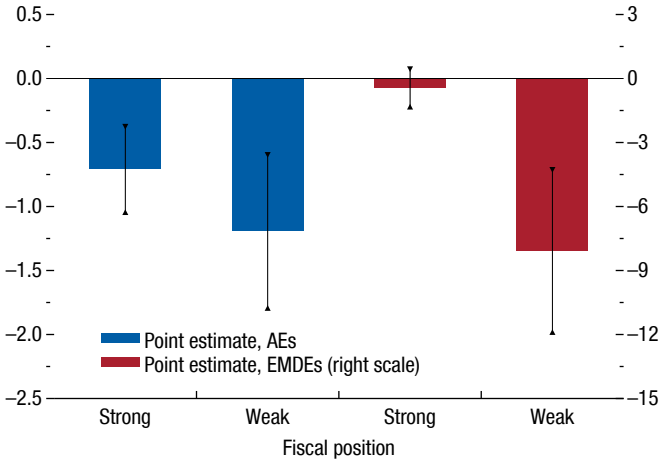
[14]Note that these estimates are not driven by boom-bust episodes. The dynamic responses are unaltered by the exclusion from the sample of the global financial crisis and its aftermath. The sample covers 43 countries over 51 years, and only a minority of excess credit episodes led to a recession. For the United States, for example, where recessions declared by the National Bureau of Economic Research are clearly classified, only about 15 percent of excess credit episodes were followed by a recession. Dell'Ariccia and others (2016) conduct similar analysis and find that about two-thirds of credit booms do not end up as busts but lead to subpar growth.

[15]Dissecting the role of debt maturity and currency denomination in emerging markets opens up avenues for future research, but data constraints are a limiting factor.

[16]A mere measure of the public-debt-to-GDP ratio is unlikely to be a sufficient statistic for fiscal space, a multidimensional assessment (IMF 2018). Different countries can support very different levels of public debt and fiscal deficits. See Box 2.1 and Ghosh and others (2013) for further discussion.

Figure 2.10. Fiscal Position and Deleveraging
(Cumulative output growth over three years; percentage points)

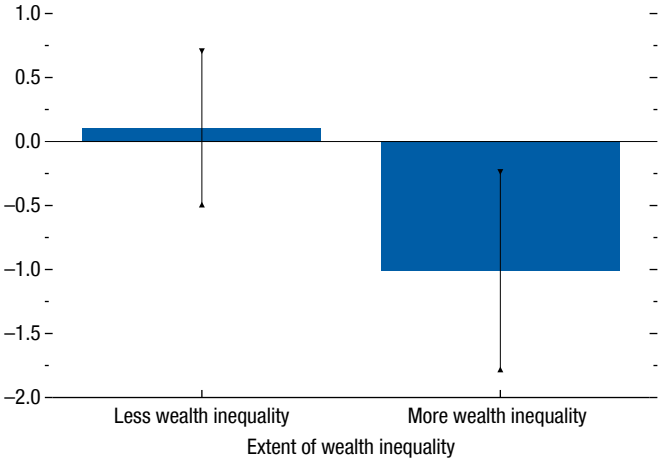
A strong fiscal position can mitigate the negative output response following excess credit buildup, especially in emerging market and developing economies.



Sources: Bank for International Settlements; Kose and others (2017); World Bank; and IMF staff calculations.
Note: The figure shows the impact of a 1 percentage point increase in the three-year trailing average excess-household-credit-to-GDP ratio on cumulative output growth over three years. Countries' fiscal position is proxied by within-year quartiles of the principal component of six fiscal indicators: (1) general government gross debt, (2) primary balance, and (3) fiscal balance—all three as a percent of GDP; (4) cyclically adjusted balance as a percent of potential GDP; and (5) general government gross debt and (6) fiscal balance—both as a percent of average tax revenues. The figure contrasts the response between the top (strong) and bottom (weak) quartiles of the fiscal position. AEs = advanced economies; EMDEs = emerging market and developing economies.

Figure 2.11. Advanced Economies: Wealth Inequality and Deleveraging
(Cumulative output growth over three years; percentage points)

Greater wealth inequality amplifies the output response following excess credit buildup.



Sources: Allen, Kolerus, and Xu (2022); Bank for International Settlements; World Inequality Database; and IMF staff calculations.
Note: The figure displays the impact of a 1 percentage point increase in the excess-household-credit-to-GDP ratio on cumulative output growth over three years. Countries are ranked by the extent of dissaving among the bottom 50 percent, where more dissaving proxies for greater wealth inequality. High wealth inequality denotes countries in the top quartile of dissaving among the bottom 50 percent over the preceding three years. Low wealth inequality denotes countries in the bottom quartile of dissaving among the bottom 50 percent over the preceding three years. Error bars represent 90 percent confidence intervals.

of magnitude in emerging market and developing economies.[17] For emerging market economies with the weakest fiscal positions, these numbers imply a drag on growth of up to 9 percent cumulative over three years.

Borrower Heterogeneity and Debt-Output Dynamics

This section analyzes the implications of increasing leverage among financially constrained households and vulnerable firms. It unpacks the mechanism described in the introduction by exploiting micro-level data on firms and households.

Households: Inequality and the Impact of Private Debt on Output

Here the focus is on the cyclical implications of debt buildup in countries differentiated according to wealth inequality. The analysis is based on the same empirical framework as in the first section but relies on micro-level data on household saving and income distribution to sort countries: dissaving among low-income households is used as a proxy for (bottom) wealth inequality.[18] Figure 2.11 contrasts the cumulative future output responses to the buildup of excess leverage in countries where households are thought to be financially constrained (more wealth inequality) and others (with less wealth inequality). Countries where households are relatively more financially constrained (more wealth inequality) tend to see a larger drag on future output following excess credit buildup (see Online Annex 2.4).

[17]This analysis should be interpreted as suggestive, since only four emerging market economies are included.

[18]To proxy for bottom wealth inequality across countries, a three-year trailing average of dissaving of households in the bottom 50 percent of income is computed using data for advanced economies from Allen, Kolerus, and Xu (forthcoming). The results are then sorted into four quartiles per year. Figure 2.11 compares the debt-output dynamics for high- (most dissaving by bottom 50 percent) and low-inequality groups.

Rising inequality (Chancel and others 2022) may also have stark implications for countercyclical policy (Mian, Straub, and Sufi 2021a, 2021b, 2021c, 2021d), an important consideration for governments as they contemplate unwinding exceptional support. Higher inequality tends to push down the equilibrium (natural) interest rate, a key concept for calibrating the pace of policy normalization as it affects both *fiscal* (Box 2.1) and *monetary* (Box 2.2) *space*.

Corporate Leverage and Investment: The Importance of Vulnerable Firms

Drilling down one level deeper than the macroeconomic analysis reported in Figure 2.9, panel 2, this subsection turns to the microeconomic drivers linking corporate leverage to investment. In so doing, it investigates the particular role played by vulnerable firms.

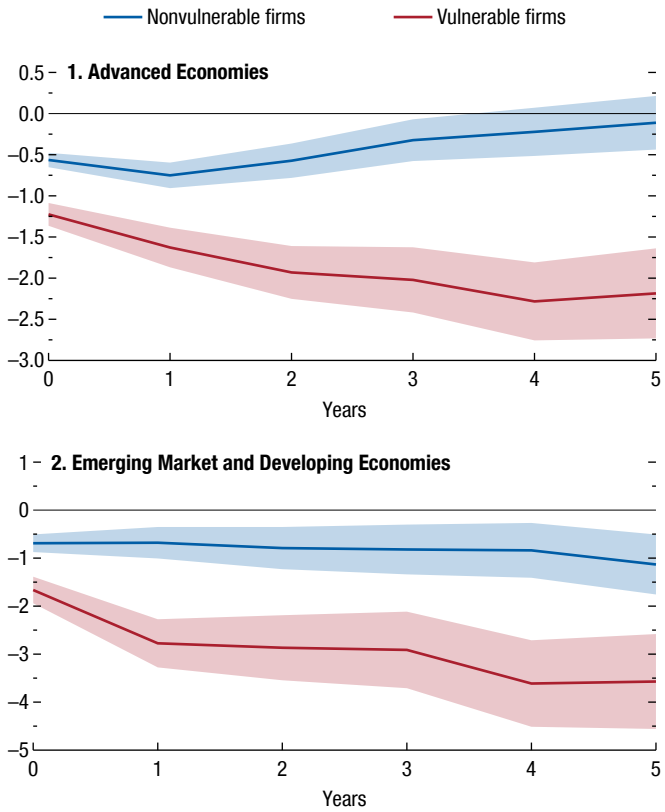
Firms' leverage buildup may hold back investment under three circumstances. First, high outstanding debt may increase the service cost of future debt, preventing further borrowing to finance new investment (Krugman 1988; Drehman, Juselius, and Korinek 2017). Second, credit booms lead to more-leveraged balance sheets and tighter borrowing constraints when firms' net worth declines (Bernanke and Gertler 1989; Bernanke, Gertler, and Gilchrist 1999). Finally, for firms with excess leverage, the return on future investment is likely to go toward repaying existing debt, decreasing equity holders' incentive to finance new investment projects (Myers 1977). Vulnerable firms—defined as highly leveraged firms with low profitability and low liquidity (interest coverage ratio less than 1)—are particularly exposed to all these channels.

To quantify the role of vulnerable firms in driving investment dynamics following leverage buildup, the analysis relies on a local projection estimation based on a comprehensive firm-level panel data set (see Online Annex 2.3).[19] Following Albuquerque (2021), leverage buildup is defined as the lagged three-year cumulative change in the debt-to-asset ratio. By including firms fixed effects, our estimates capture how firms' investment responds when the firm has higher (or lower) leverage increase than usual; sector-country-year fixed effects help pin down the partial equilibrium effect of leverage buildup by controlling for other time-varying confounding factors, such as the macroeconomic cycle and general equilibrium forces at play.

[19]The analysis is based on Bureau van Dijk Orbis and comprises 2.5 million listed and unlisted firms from 1998 to 2018.

Figure 2.12. The Role of Vulnerable Firms
(Cumulative investment loss; percentage points)

Cumulative investment losses associated with leverage buildup are larger for vulnerable firms.



Sources: Bureau van Dijk Orbis; and IMF staff calculations.
Note: The figure illustrates the responses of firms' investment ratio following a one-standard-deviation increase in the debt-to-asset-accumulation ratio, conditional on firms' being vulnerable. Vulnerable firms have an interest coverage ratio of less than 1 and are in the top tercile of the debt-to-asset ratio distribution and the bottom tercile of the return on assets distribution. Shaded areas represent 90 percent confidence intervals.

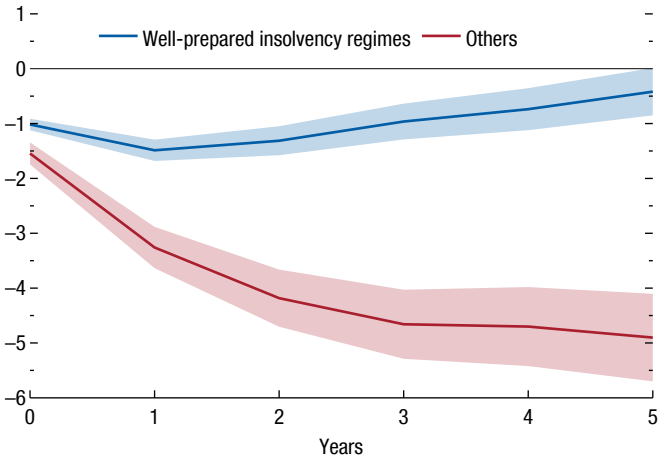
As reported in Figure 2.12, following leverage buildup, vulnerable firms reduce investments the most, generating permanent losses to the stock of tangible assets. This is true in advanced economies and emerging markets alike. The maximum effect is reached after four years.

The Role of Effective Insolvency Frameworks

To mitigate these negative effects and support recovery, vulnerable nonviable firms need to be restructured or liquidated to free up resources that can be directed to new growth areas. However, coordination frictions among creditors, weak contract enforcement, costly liquidation procedures, and asymmetric information may delay the restructuring process.

Figure 2.13. The Role of Effective Insolvency Frameworks
(Cumulative percentage points)

Effective insolvency and restructuring proceedings prevent a long-term decline in the future stock of tangible capital following firms' leverage buildup.



Sources: Bureau van Dijk Orbis; IMF, Crisis Preparedness Index; and IMF staff calculations.
Note: The figure illustrates the cumulated response of firms' investment ratio following a one-standard-deviation increase in leverage buildup, conditional on a country's insolvency regime. Well-prepared insolvency regimes are defined as those of countries in the top quartile of the IMF Strategy, Policy, and Review and Legal Departments' indicator of crisis preparedness in 2020. Shaded areas represent 90 percent confidence intervals.

The effectiveness of insolvency frameworks plays a key role that can be analyzed using a novel IMF indicator that sorts countries according to the preparedness of their insolvency frameworks to face systemic crises.[20] Figure 2.13 compares the cumulated response of investment ratios to firms' leverage buildup in countries with well-prepared insolvency systems in place versus others. The findings suggest that inadequate insolvency proceedings account for most of the long-term decline in the stock of tangible capital.

Countercyclical Policy Effects amid High Private Debt

Understanding how private debt and its distribution affect the transmission of countercyclical macroeconomic policy is important to help countries calibrate the exit from the expansionary fiscal and monetary policy responses to the COVID-19 recession. This section analyzes (1) the importance of countries' aggregate debt levels for the impact of fiscal consolidation and monetary tightening and (2) how policy affects different groups of households and firms. In particular, it investigates whether tightening policies has a larger impact on more financially constrained households and firms.

The analysis uses local projections to estimate the effects of policies on real output, household consumption, and corporate investment over time for a sample of advanced economies and emerging markets (see Online Annex 2.5). Fiscal and monetary policy shocks (changes in policy that are exogeneous to the near-term economic outlook) are borrowed from previous cross-country studies (IMF 2021b, Chapter 2, for fiscal consolidations; Furceri, Loungani, and Zdzienicka 2016 for monetary tightening). The aggregate response of output to these fiscal and monetary policy shocks is in line with the previous literature (Ramey 2016).[21]

Private Debt and the Transmission of Countercyclical Policy

The increase in private debt before and through the COVID-19 recession may have changed how economies respond to policy tightening, with more-leveraged households and firms having greater sensitivity. This is first investigated at the country level by interacting the policy shock with an indicator variable equal to 1 for each country in periods when the ratio of private debt to GDP is in the top quartile for each country (Ramey and Zubairy 2018 and April 2020 WEO for fiscal policy; Tenreyro and Thwaites 2016 for monetary policy). Figure 2.14 shows that fiscal consolidation is more contractionary when the private-debt-to-GDP ratio is high.

Heterogeneous Transmission of Monetary and Fiscal Policies

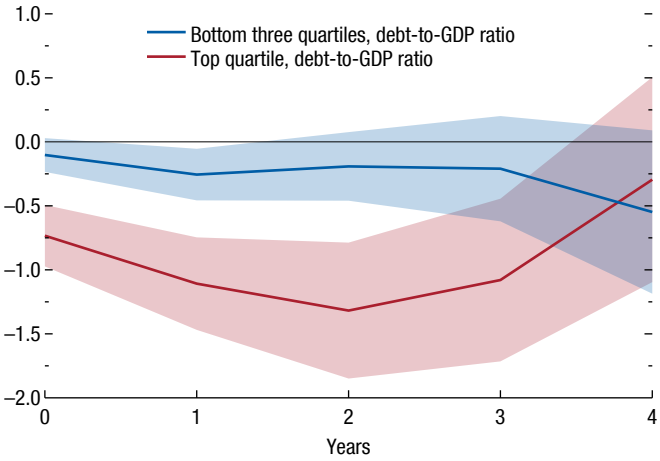
Recent studies recognize that the effects of macroeconomic policy depend on the characteristics of households and firms. For *households*, policy transmission is affected by their income, their debt, and the

[20]An effective and well-prepared insolvency regime is characterized by a comprehensive set of legal tools and institutions relevant for widespread restructuring and insolvency proceedings, such as out-of-court and hybrid restructuring, rapid reorganization and liquidation processes, and a proper institutional framework. For a detailed discussion on the construction of the indicator and its values, refer to Araujo and others (2022) and Online Annex 2.3.

[21]A fiscal consolidation of 1 percent of GDP leads to a ¾ percent decline in output, and a monetary policy tightening of 100 basis points leads to a ½ percent decline in output after two years. See Online Annex 2.5 for details.

Figure 2.14. Output Sensitivity to Fiscal Consolidation as Function of Private Debt
(Percentage points)

Fiscal consolidation leads to a larger contraction in real output when private sector debt is high.



Sources: IMF, Global Debt Database; and IMF staff calculations.
Note: The solid lines represent the estimated response of real GDP to a fiscal consolidation shock. Shaded areas represent 90 percent confidence intervals. The *x*-axis indicates the number of years after the shock.

types of assets they hold (particularly whether illiquid or liquid). The intuition is straightforward: households without liquid assets, and in particular indebted households, have a higher propensity to consume out of disposable income than savers, who can maintain consumption by drawing down savings following negative shocks to income (Jappelli and Pistaferri 2010, 2014; Crawley and Kuchler 2018; Kaplan, Moll, and Violante 2018). Studies focused on the effects of monetary policy on consumption for the United Kingdom and the United States have found that the *indirect* effects of an unexpected change in interest rates, which operate through general equilibrium changes in labor demand and housing wealth, far outweigh the standard *direct* intertemporal substitution effect (Kaplan, Moll, and Violante 2018; Slacalek, Tristani, and Violante 2020). These indirect effects are particularly large for the lowest-income households, with the largest changes in income after a monetary policy shock (Lenza and Slacalek 2018). With lower-income households having the lowest net worth (see Kumhof, Rancière, and Winant 2015 for evidence for the United States), one would also expect these to be most affected by the direct effect of monetary policy tightening on disposable income, through higher debt-service costs.

For *firms*, the channels are similar, with the literature focusing on how firms' balance sheets affect their access to external financing. The financial accelerator model (Bernanke, Gertler, and Gilchrist 1999) shows how changes to the net worth of firms over the business cycle amplify the effects of monetary policy and other changes to credit conditions. In the United States, the leverage and liquidity of firms have been found to affect how responsive they are to monetary policy (Ottonello and Winberry 2020; Jeenas 2019).

Figure 2.15, panel 1, reports the results for the effect of fiscal consolidation on consumption by income quintiles.[22] The figure shows the effects on each income quintile two years after the shock. It highlights that (1) the impact of consolidation is negative for all income groups and (2) the largest impact is on the consumption of the lowest-income-quintile households. After two years, the consumption drop among the lowest-income quintile is twice as large as the consumption decline among the highest-income quintile.[23] The results are similar for all horizons, and the effect of the fiscal consolidation persists in each case.

Figure 2.15, panel 2, reports the results for the effect of monetary tightening on corporate investment by leverage quintiles.[24] The figure shows that the impact of tightening is again largest for the most leveraged quintile of firms. After two years, investment by the most leveraged quintile is a cumulative 6½ percent lower in response to a surprise 100 basis point rise in the policy rate. This is 4 percentage points lower than the decline in investment by the least leveraged quintile. As with fiscal consolidation, the effects of monetary tightening on investment are persistent.

Overall, these results point to potential amplification of output costs in countries with private debt concentrated in vulnerable households and firms. This concern may be lessened in countries where stringent macroprudential measures were in place before the COVID-19 recession. Intuitively, measures that "lean against the wind," such as loan-to-value restrictions and debt-to-income caps, may have limited the

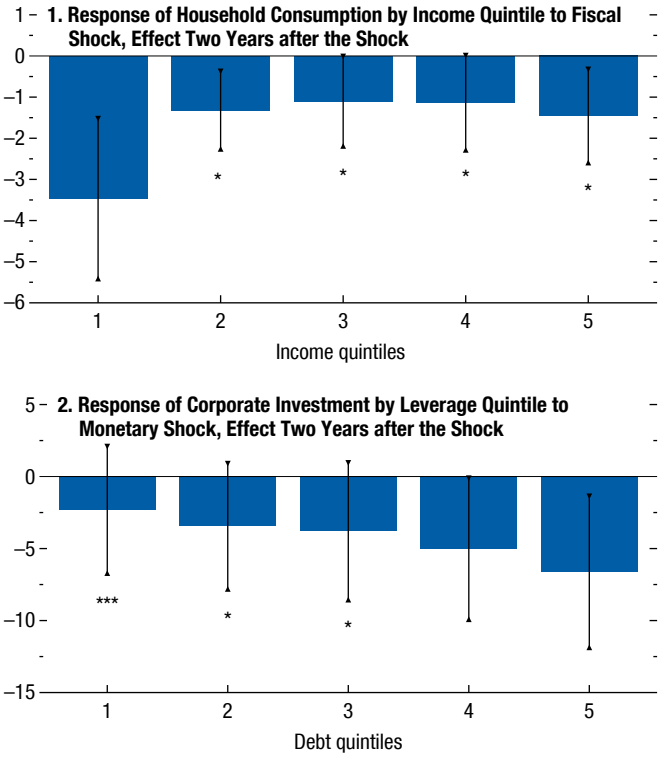
[22]The analysis is based on a sample of 13 European countries from 1990.

[23]Income and wealth inequality show close correspondence (see Figure 2.3). Low-income households will also have the lowest net assets as a share of income and therefore will be the most financially constrained. However, a lack of distributional balance sheet data for most countries limits the empirical exercise to income distribution.

[24]This analysis is based on a reduced sample of 25 economies from 1998 to allow sufficient time coverage.

Figure 2.15. Effects of Macro Policy Tightening on Heterogeneous Households and Firms
(Percent change)

The effect of fiscal consolidation on consumption is largest in lower-income households. Monetary policy tightening negatively affects corporate investment for the most leveraged firms.



Sources: Allen, Kolerus, and Xu (2022); Bureau van Dijk Orbis; and IMF staff calculations.
Note: The bars in panel 1 represent the estimated effect of a fiscal consolidation shock of 1 percent of GDP on the consumption of five groups of households, according to their income levels, two years after the shock. In panel 2, the bars represent the estimated effect of a monetary policy tightening shock of 100 basis points on the real investment of five groups of firms, according to their leverage ratios, two years after the shock. The *x*-axis indicates the quintile of corporate leverage. Error bars denote 90 percent confidence intervals. Statistically significant differences between the lowest income quintile in panel 1 (and highest leverage quintile in panel 2) and other quintiles at the 1, 5, and 10 percent confidence levels are denoted, respectively, by ***, **, and *.

buildup of debt among vulnerable households and helped create buffers for banks, limiting the output cost of tightening monetary and financial conditions (see the discussion in the April 2021 GFSR and Online Annex 2.5).[25]

[25]Online Annex 2.5, Figure 2.5.4, estimates the marginal effect of macroprudential regime stringency (based on iMaPP, the IMF's integrated macroprudential policy database) in mitigating the output decline from monetary tightening. The medium-term (two years) effect of tightening is reduced by half in countries where the macroprudential regime is the most stringent.

Conclusions and Policy Implications

Soon after the pandemic began in early 2020, exceptional measures to save lives and livelihoods were deployed. On top of direct fiscal support to households and firms, governments helped sustain the flow of credit: central banks' accommodation and temporary financial regulatory changes, including repayment moratoriums and debt guarantees, offered a lifeline to many businesses and households.

Still, the impact of the pandemic on households' and firms' balance sheets has been unequal across and within countries, in large part reflecting differences in sectoral composition. Contact-intensive services have contracted during the pandemic, while production and exports of goods and services substitutes (for example, appliances, computer chips, software) have thrived. Relatedly, the situation of workers in tourism services, restaurants, hospitality, and entertainment has in many cases remained precarious two years after the start of the pandemic, while labor shortages and rapid wage increases have become the norm in construction and logistics, for example (IMF 2021c). The war in Ukraine has further disrupted global supply chains. Large increases in the prices of energy and food products are likely to affect low-income households—especially in emerging markets and developing economies—and could spill over to many industries via higher input prices if the conflict is prolonged (see Chapter 1).

This chapter estimates that recent leverage buildup could slow the recovery by a cumulative 0.9 percent of GDP in advanced economies and 1.3 percent in emerging markets over the next three years. But these are average effects based on cross-country aggregate data.[26] Financially constrained households and vulnerable firms, which have grown in number and proportion during the COVID-19 pandemic, are expected to cut spending by more, especially in countries where the insolvency framework is inefficient and fiscal space limited.

As monetary policies are being normalized amid rising inflationary pressures, governments should calibrate the pace of fiscal consolidation to country circumstances to avoid large disruptions and potential scarring. Where the recovery is well underway and balance sheets are in good shape, fiscal support can be reduced faster, facilitating the work of central banks.

[26]The estimates also predate the war in Ukraine and its possible consequences for balance sheets.

Elsewhere, targeted support can be considered within credible medium-term fiscal frameworks (see Box 2.1).

In particular, government support to firms could be limited to circumstances in which there is clear market failure (April 2022 *Fiscal Monitor*). Where a wave of bankruptcies in sectors heavily hit by the pandemic could spill over to the rest of the economy, for example, governments could provide incentives for restructuring over liquidation, and where necessary, solvency support could be considered. Among possible frameworks for such support, debt relief in the form of quasi-equity injections into small and medium enterprises (for example, through profit participation loans) could be considered in countries with adequate fiscal space, transparency, and accountability (see Díez and others 2021). Of course, targeting the right viable businesses—those that are insolvent as a result of the pandemic but that have viable business models—is hard (see the April 2021 GFSR). To lessen the burden on public finances, temporary higher taxes on excess profits could be envisaged. This would help claw back some of the transfers to firms that did not need them (Gourinchas and others 2021).

The analysis presented in this chapter also points to the need to enhance restructuring and insolvency mechanisms (through, for example, dedicated out-of-court restructuring) to promote a rapid reallocation of capital and labor toward the most productive firms (Araujo and others 2022; Díez and others 2021). To address the short-term impact of pandemic-related insolvency, countries could prioritize the weakest aspects of their regimes while working on more long-term comprehensive reforms. Similarly, if large household debt threatens the recovery, governments should consider cost-effective debt-restructuring programs aimed at transferring resources to relatively vulnerable individuals with a high propensity to consume. By design, these programs should seek to minimize moral hazard (April 2012 WEO). The debt bias in corporate and personal taxation should also be eliminated to avoid providing incentivizes for excessive debt buildup, resource misallocation, and recurrent boom-bust cycles.

Finally, the chapter stresses the importance of distributional considerations to improve macroeconomic forecasting and policymaking. While further research is needed to enrich the tools and models available to policymakers, the priority is the collection of more detailed and real-time data on firms' and household balance sheets.

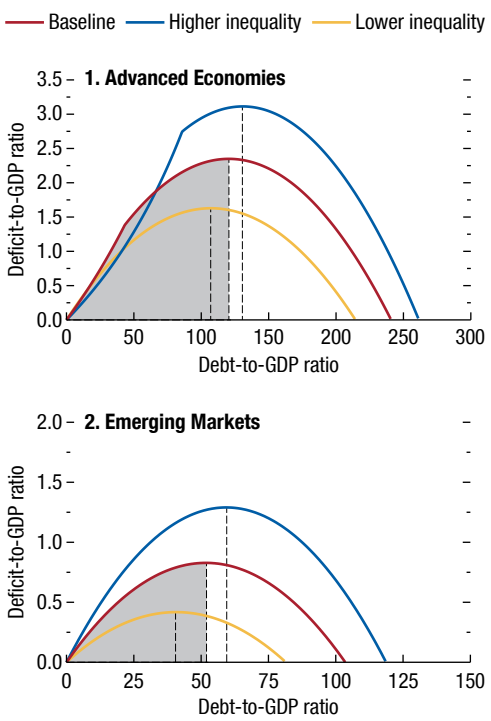
Box 2.1. Inequality and Public Debt Sustainability

The pandemic has exacerbated income inequality, extending a secular trend started in the 1980s (April 2021 *Fiscal Monitor;* Azzimonti, de Francisco, and Quadrini 2014; Chancel and Piketty 2021; Chancel and others 2022). At the same time, interest rates have remained low despite steady increases in public debt. This apparent contradiction can be rationalized: higher-income households tend to save a larger share of their revenues. As their proportion to national income increases, so do savings and the associated demand for both private and public debt securities. This increase in savings lowers equilibrium interest rates and eventually the cost of borrowing (Mian, Straub, and Sufi 2021a, 2021b, 2021d; Del Negro and others 2017; Box 2.2). Therefore, *all else equal*, higher top income inequality raises the sustainable levels of public debt and primary deficit (Mian, Straub, and Sufi 2021c; Reis 2021). Rising inequality may require larger social transfers (and public debt) after the pandemic, but at the same time enhances governments' ability to finance them. Of course, all else is not always equal. Higher inequality could lead to lower potential growth, and increases in government debt are eventually met with higher interest rates as liquidity, regulatory, and safety premiums on government debt erode (Krishnamurthy and Vissing-Jorgensen 2012; Lian, Presbitero, and Wiriadinata 2020). Sustainable public debt has its limits.[1]

This box analyzes the implications of inequality for debt sustainability in a framework that allows those counteracting forces to play out. As governments contemplate exiting pandemic-related support policies, assessing the stringency of fiscal budget constraints is key to calibrating the pace of consolidation.

A simple calibrated model (based on Mian, Straub, and Sufi 2021c) can be used to draw a *deficit-debt-phase diagram* that depicts the set of sustainable combinations of primary deficit and debt (as a percent of GDP); meaning the combination of primary deficit and debt that can be maintained permanently given long-term growth and interest rates. The peak of the diagram shows the maximum sustainable debt-deficit level, taking into account economies' nominal potential growth (G) and forces driving the interest rate (R). The region to the left of the maximum represents a *free-lunch* zone: primary deficits—either through lower taxes or higher expenditures—can be increased to support the economy without going down an unsustainable debt path. Because increasing debt eventually raises interest rates, the sustainable deficit starts shrinking to the right of the peak as debt increases. Eventually, the

Figure 2.1.1. Effect of Income Inequality on the Sustainable Level of Debt
(Percent)



Sources: Organisation for Economic Co-operation and Development; and IMF staff estimates.
Note: The vertical line relates to the maximum sustainable primary deficit and its corresponding debt-to-GDP ratio. The shaded area indicates the free-lunch zone. The baseline calibration identifies savers, with the top 10 percent earning a 40 percent share of income in advanced economies and a 48 percent share of income in emerging markets. The advanced economies' (respectively, emerging markets') model is calibrated with an initial level of debt of 105 percent (55 percent) of GDP, an initial nominal interest rate of 1 percent (4.7 percent), and a nominal long-term trend growth of 3.2 percent (6.2 percent). The higher-/lower-inequality scenario adds/subtracts a 5 percentage point share of income to/from the baseline. In both cases, the debt-to-GDP ratio elasticity of interest rates is 0.017, implying that a 10 percent increase in the debt-to-GDP ratio leads the interest rate to increase by 17 basis points (Mian, Straub, and Sufi 2021c). A higher (lower) elasticity would decrease (increase) debt thresholds.

The author of this box is Anh Dinh Minh Nguyen.

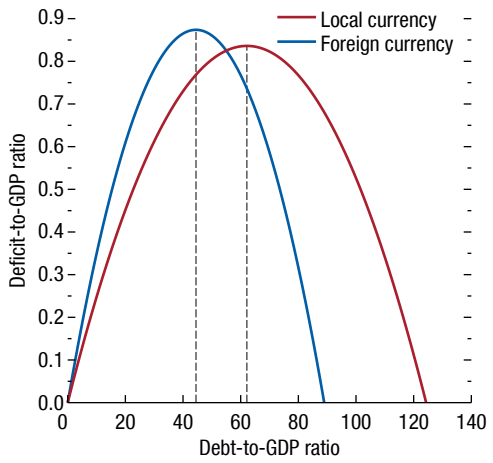
[1]Other institutional factors matter, including the effectiveness and credibility of policy, the interaction with monetary policy, and the quality of institutions (October 2021 *Fiscal Monitor;* IMF 2018).

Box 2.1 *(continued)*

interest-growth differential ($R - G$) becomes positive, and a primary surplus (negative deficit) is required for a stable debt-to-GDP ratio.

Figure 2.1.1 highlights differences between advanced economies and emerging markets:[2] the sustainable level of debt is larger in advanced economies, because higher convenience premiums for liquidity and safety push R down.[3] In both advanced economies and emerging markets, rising income inequality over the past four decades may have helped increase the sustainable *deficit-debt* pairs (Figure 2.1.1, blue lines), and the effect may have been sizable. Reasonable calibration suggests an increase in sustainable deficit of almost a full percentage point in advanced economies. This estimate is a higher bound, however. In countries where inequality undermines progress in education or leads to lower investment as a result of social unrest, for example, potential growth and the sustainable level of debt and deficit may be reduced. A country's resilience to higher debt is also determined by the share of public debt denominated in foreign currency. Calibrating the model above to emerging markets, the analysis shows that a higher share of foreign-currency-denominated debt tends to mean less room for fiscal support in the event of depreciation, highlighting higher solvency risks in emerging markets and the need to build buffers (Figure 2.1.2, blue line).

Figure 2.1.2. Debt Denomination
(Percent)



Sources: Organisation for Economic Co-operation and Development; and IMF staff estimates.
Note: The model assumes an exchange rate depreciation of 30 percent in the event of a negative shock. The blue line reflects the case in which all debt is denominated in foreign currency, while the red line is the case in which all debt is in local currency. An economy with mixed-denomination debt would lie between these two cases.

[2]Parameters for advanced economies have been calibrated to match the purchasing-power-parity-weighted average among advanced economy members of the Organisation for Economic Co-operation and Development in 2019, before the pandemic recession of 2020–21. Emerging market parameters have been calibrated to match the purchasing-power-parity-weighted average for Brazil, Chile, China, Colombia, Costa Rica, Hungary, India, Indonesia, Mexico, Poland, Russia, South Africa, and Turkey in 2019. Also see the note to Figure 2.1.1 for specific calibrations in emerging markets and advanced economies.

[3]Of course, country-specific factors, such as the elasticity of interest rates to debt, market access, and the currency denomination of public debt, matter as well.

Box 2.2. Rising Household Indebtedness, the Global Saving Glut of the Rich, and the Natural Interest Rate

The "saving glut of the rich" is a term coined to describe the substantial rise in saving at the very top of the income distribution in the United States over the past four decades (Mian, Straub, and Sufi 2021d). This phenomenon has coincided with rising household indebtedness concentrated among lower-income households and rising income inequality. It may have also contributed to the secular decline of the natural rate of interest (Mian, Straub, and Sufi 2021b; Platzer and Peruffo 2022; Rachel and Summers 2019). Intuitively, as debt-service payments transfer income from low-propensity-to-save (borrower) households to high-propensity-to-save (lender) households, the ensuing rise in net supply of savings puts downward pressure on the natural interest rate.

The phenomenon may not be limited to the United States. This box presents new cross-country evidence of a *global* saving glut of the rich and its implications for the *natural interest rate*. The analysis builds on Allen, Kolerus, and Xu (2022) and combines multiple sources (raw microeconomic survey data, tax tabulations, and national accounts) for 41 advanced and emerging market economies.[1]

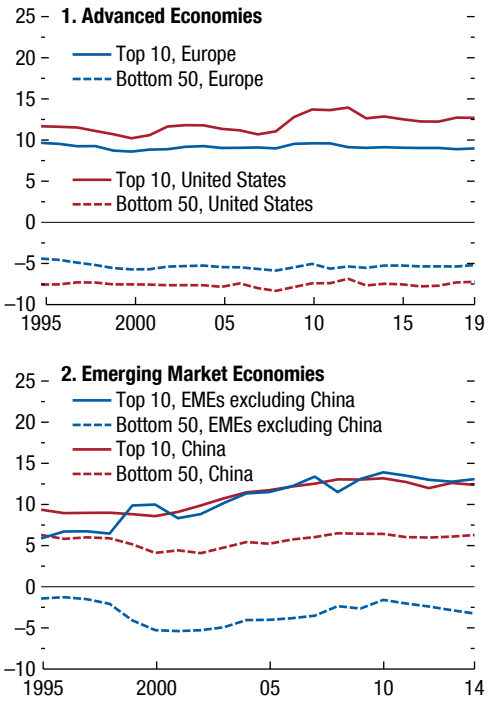
Global Saving Glut of the Rich

Estimating saving out of permanent income or wealth is challenging, especially when considering a panel of countries. This box relies on indirect evidence that income and wealth inequality are highly correlated (Bricker and others 2020; Kuhn, Schularick, and Steins 2020; Figure 2.3) and bases the analysis on current income distribution. Figure 2.2.1 suggests that saving is distributed highly unequally. In advanced economies, the richest 10 percent of households account for most of aggregate saving, about twice that of middle-class households (sixth decile to eighth decile). The poorest 50 percent typically dissave at a rate ranging from 4 percent to 7 percent of national income a year, consistently more in the United States than in Europe.[2]

Emerging market economies show broadly similar saving levels by the rich but slightly smaller dissaving by the bottom 50 percent, possibly because of more restricted access to finance. China stands out: middle-class saving reaches 20 percent of national income, and saving by the bottom 50 is positive.

The global financial crisis triggered sizable increases in saving by the rich in the United States, unlike in Europe, where the distribution of saving remained

Figure 2.2.1. Saving by Income Group
(Percent of national income)



Source: IMF staff calculations.
Note: Europe: Weighted average for 27 European economies; EMEs excluding China: Weighted average of the Dominican Republic, India, Korea, Mexico, Peru, Russia, and South Africa. EMEs = emerging market economies; US = United States.

The authors of this box are Cian Allen and Christina Kolerus. The analysis extends Allen, Kolerus and Xu (2022) to a larger set of countries.

[1]Given important data limitations, extending the series to emerging market economies remains a challenge and relies on key assumptions. First, data on the distribution of (after-tax) disposable income is extended over time using growth rates of the distribution of before-tax income, which is more widely available (for countries with both series available, the time trends are very similar). Second, the raw survey data are not adjusted for underreporting of the top of the distribution, missing imputed rents and retained earnings, as they are for advanced economies.

[2]Fagereng and others (2019) stress that capital gains explain nonhomothetic saving rates across households, which otherwise would be constant.

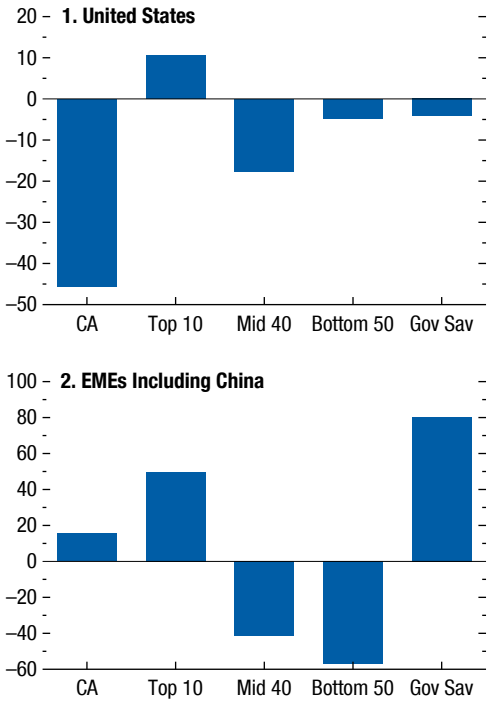
Box 2.2 *(continued)*

broadly stable. In the largest emerging markets (China, India, Mexico, South Africa), rich households' saving has increased steadily since the 2000s.

Implications for the Natural Interest Rate

Voluminous capital market literature has established that the global saving glut may be one of the drivers of the secular decline in the global natural interest rate (see, for example, Bernanke 2005; Caballero, Farhi, and Gourinchas 2008). The preceding discussion stresses that rich households across the world may have been important contributors to the global saving glut. Figure 2.2.2 suggests that these two insights could be combined. Relative to the mid-1990s, the largest emerging markets have seen exports of savings by the rich, along with public savings, feeding the global saving glut via current account surpluses. In the United States, the situation has been more nuanced. Saving by the rich has been associated with financing large dissaving by the nonrich and the government (Mian, Straub, and Sufi 2021d), but foreign saving has also contributed, leading to a current account deficit (Figure 2.2.2).

Figure 2.2.2. Absorption of Accumulated Saving
(Percent of national income)



Source: IMF staff calculations.
Note: The figure shows the accumulated difference for each variable over 1996–2019 for the United States and 1996–2015 for EMEs, relative to the average levels in 1994 and 1995, in percent of the national income. CA = current account; EMEs = emerging market economies; Gov Sav = government saving.

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CHAPTER 3

A GREENER LABOR MARKET: EMPLOYMENT, POLICIES, AND ECONOMIC TRANSFORMATION

The green economic transformation needed to achieve net zero emissions will also require changes in employment. This chapter examines the labor market implications of this transition, using a mix of empirical and model-based analyses. Looking at a sample of largely advanced economies, the empirical analysis indicates that both greener and more polluting jobs are concentrated among small subsets of workers. Individual workers face tough challenges in moving to greener jobs from more pollution-intensive jobs, complicating labor reallocation. Higher skills make job transitions easier, highlighting the potential importance of training. Stronger environmental policies help green the labor market and appear more effective when reallocation incentives are not blunted. Finally, a policy package incorporating a green infrastructure push, phased-in carbon prices, and targeted training and an earned income tax credit to provide income support and incentivize labor supply could put an economy on a path to net zero emissions by 2050, with an inclusive transition. Model simulations for a representative advanced economy suggest that about 1 percent of employment would shift toward greener activities over a 10-year period. By contrast, for a representative emerging market economy, about 2.5 percent of employment would shift, reflecting differences in workforce skills and greater reliance on higher-emissions-intensive production. Delays in policy actions will require sharper labor market adjustments to achieve net zero emissions.

Introduction

The COVID-19 pandemic has generated enormous disruptions and dislocations in economies and labor markets.[1] In shaping the recovery from the pandemic, policies can be primed to address key challenges and create more productive, resilient, and sustainable economies (see Georgieva and Shah 2020 for a discussion). Of all the urgent issues, tackling human-induced climate change is among the most pressing.

Mitigating global warming will require substantial reductions in greenhouse gas (GHG) emissions. The objective of limiting the average global temperature increase to well below 2°C and preferably no more than 1.5°C above preindustrial levels was endorsed by policymakers around the world in the 2015 Paris Agreement (see IPCC 2015, 2018; COP 2015). For this goal to be met, net emissions (the difference between GHG emissions produced and GHG removed from the atmosphere) must decline to zero by 2050.

The green transformation of production structures needed to achieve net zero emissions—with large changes expected in capital infrastructure for greener energy and products—will also entail a transformation of the labor market, changing the allocation of workers across occupations and sectors. Previous *World Economic Outlook* (WEO) analysis has found the policy package required to achieve net zero emissions by 2050 would lead to about 2 percent of the global workforce changing the sector in which they work over the next 30 years, with workers moving from polluting, higher-emissions sectors to those that are cleaner and generate lower emissions.[2]

Aiming to better understand the employment changes required for the green transformation and possible obstacles, this chapter investigates the environmental properties of jobs, how easily workers are able to move into greener—that is, more sustainable, less polluting, and emissions-lowering—employment, and how policies may affect the greening of the labor market. It makes two key contributions: (1) a new cross-country, harmonized set of indicators of the environmental properties of jobs, built in part on earlier single-country studies; and (2) a new model-based

The authors of this chapter are John Bluedorn (co-lead), Niels-Jakob Hansen (co-lead), Diaa Noureldin, Ippei Shibata, and Marina M. Tavares, with support from Savannah Newman and Cynthia Nyakeri. The chapter benefited from comments by M. Scott Taylor and internal seminar participants and reviewers.

[1]See Chapters 1 and 3 of the April 2021 *World Economic Outlook* for evidence and discussion of the impacts of the COVID-19 pandemic and associated recession on economic activity and labor markets.

[2]See Chapter 3 of the October 2020 WEO. The package involved a combination of international carbon pricing, a green investment push, and targeted cash transfers to groups at higher risk of being adversely affected by mitigation measures.

analysis of labor reallocation in the green transition with an expanded set of policy instruments. The chapter examines the environmental properties of jobs through two lenses: *what workers do* (their occupations) and *where they work* (the sectors in which they are employed). It takes the perspective that the environmental properties of jobs are multidimensional, involving the extent to which workers undertake tasks that improve environmental sustainability (*green intensity*) and the degree to which their work involves activities exacerbating pollution (*pollution intensity*), as well as the level of emissions generated per worker (*emissions intensity*). Among the many occupations classified, an example of a more green-intensive occupation is an electrotechnology engineer, while a more pollution-intensive occupation is a paper mill machine operator. An example of a typically more emissions-intensive sector is utilities, including electricity and gas.[3]

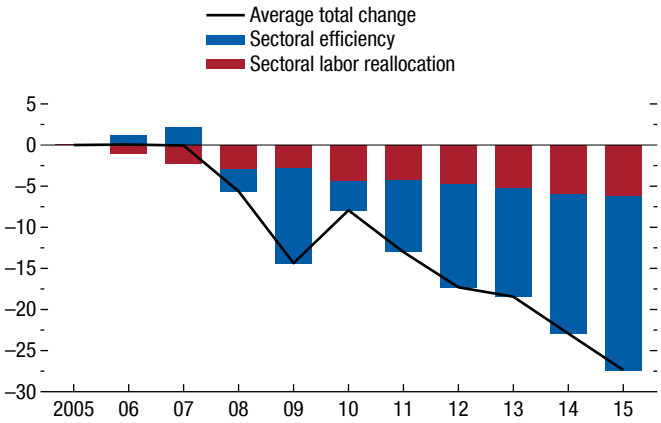
Employment changes have already played an important role in improving sustainability, based on the recent experience in a sample of advanced economies. Between 2005 and 2015, average total carbon emissions per worker (the measure of emissions intensity) in the sample declined by 27 percent (Figure 3.1).[4] The bulk of that decrease was attributable to improved sectoral efficiency, including a mix of emission-lowering, within-sector labor reallocation and changes in capital and technology. However, almost a quarter of the decline was related to workers' moving from higher- to lower-emissions-intensive sectors. Therefore, although sectoral labor reallocation has not been the primary contributor to emissions reductions, it has played a role, alongside within-sector labor reallocation.

Drawing both on empirical and model-based analyses, the chapter asks:

- **How green is the labor market?** What are the environmental properties of jobs, and how do those properties vary across economies and sectors? How are they associated with demographic characteristics (such as educational attainment and urbanicity) and earnings?
- **How easily do workers transition into greener jobs?** What are the characteristics of workers (including their employment history and education or skills) who more readily move into these jobs? Do workers have the skills needed for greener employment?
- **How do environmental policies affect the reallocation of workers into greener jobs?** Can policies help make the labor market greener? Is the effectiveness of such policies affected by an economy's labor market policies and structural features? What are the consequences for overall employment and income distribution?

Figure 3.1. Evolution of Average Carbon Emissions Intensity
(Percentage point change in CO_2 emissions per worker relative to 2005)

Average emissions per worker decreased between 2005 and 2015 for the countries in the sample, with labor reallocation playing a role.



Sources: IMF, Climate Change Indicators Dashboard; International Labour Organization; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: The figure shows the percentage point change in the cross-country average carbon emissions intensity relative to 2005. See Online Annex 3.1 for details on the underlying country sample and data sources.

Importantly, the empirical analysis in this chapter takes the prevailing state of technology as given, investigating how labor allocation may respond to policy changes. As suggested by Figure 3.1, technology adoption and innovation—a focus of Chapter 3 of the October 2020 WEO—also has a critical role to play in the green economic transformation. The model-based analysis incorporates technological change (potentially

[3]The specific measurement of these three intensity indicators is described in the next section.

[4]Carbon (carbon dioxide or CO_2) emissions are more readily available and comparable across sectors and economies over a longer period of time than the broader category of GHG emissions. Moreover, carbon emissions account for the largest share of global GHG emissions, at three-fourths of the total (US EPA 2022). Carbon emissions are the emission measure used in this chapter. Total carbon emissions incorporate both direct and indirect carbon emissions. Indirect emissions are counted as the carbon emissions embodied in intermediate inputs used in production (see the IMF Climate Change Indicators Dashboard and Online Annex 3.1 for further details).

spurred by policy), allowing its contribution to the green transition in the labor market to be gauged. Data constraints mean that the empirical analysis uses a limited sample of 34 countries (mainly the United States and advanced economies in Europe) covering 2005–19. To assess how an economy's development level may affect employment in the green transition, illustrative scenarios in the model-based analysis are calibrated to reflect initial conditions for representative advanced and emerging market economies. These are the chapter's main findings:

- *More green- and pollution-intensive jobs appear concentrated among a subset of the workforce, leading to low average green and pollution intensities of jobs.* Green and pollution intensities quantify the share of activities in a given occupation that improve or degrade environmental sustainability, respectively. The lion's share of jobs is neutral in respect to these two properties, with zero green and pollution intensity scores. There is a wide dispersion of environmental properties of jobs across and within sectors, suggesting that scope exists for reallocation both across and within sectors to help green the labor market. Higher-skilled and urban workers tend to have more green-intensive occupations than lower-skilled and rural workers. Moreover, even with skills and other individual-level characteristics controlled for, green-intensive occupations exhibit an average earnings premium of almost 7 percent compared with pollution-intensive occupations.
- *Environmental properties of jobs tend to be sticky in transitions, pointing to difficulties for workers in more pollution-intensive or neutral jobs in moving up the green ladder.* The probability that a worker will transition into greener work from pollution-intensive work when changing jobs is comparatively low, though not statistically significantly different than the probability of making that transition from a neutral job, which reflects how tough it is to change occupations. Higher skills make it easier to transition into more green-intensive work, suggesting that further human capital accumulation could help boost workers' prospects for greener employment.
- *Environmental policies tend to be more effective when labor market policies and structural features do not inhibit incentives for reallocation.* More stringent environmental policies are associated with employment that is more green- and less pollution-intensive, making for a greener labor market. Labor market policies and structural features may need realignment to avoid diminishing the impetus for labor reallocation from greener policies. In particular, with a strong recovery from the COVID-19 pandemic recession underway, it will be important to reduce job retention support measures to help provide incentives for reallocation (in line with country-specific circumstances).
- *With the appropriate policy package, an economy can get on the path to net zero emissions by 2050, while improving the average economic conditions of lower-skilled workers.* Similar to earlier IMF advice, the package should include a green infrastructure push and a gradual phase-in of carbon taxes. It should also include a training program—targeted toward lower-skilled workers to boost their productivity in lower-emissions-intensive work—and an earned income tax credit, providing income support and incentivizing labor supply. Both would help encourage labor reallocation while ameliorating inequality.
- *In an illustration with a representative advanced (emerging market) economy, about 1 (2.5) percent of employment will shift from higher- to lower-emissions-intensive work over the next 10 years to get on the net zero emissions path.* The shift is larger for emerging markets, reflecting their larger initial employment shares in higher-emissions-intensive sectors. For the group of advanced economies, the size of these labor shifts is smaller than the almost 4 percent of employment per decade shift from industry to services sector work since the mid-1980s. Finally, while the overall long-term employment effects are small, they can be slightly positive or negative depending on the magnitude of adjustment needed and the policy package used.

Taken together, the results indicate that the employment changes required by the green transformation are moderate in a historical, macroeconomic context. This reflects in part the small initial shares of employment that are more pollution-intensive and in higher-emissions-intensive sectors.[5] Modest technological and productivity improvements—spurred by policies in the model scenarios—are essential to maintain or grow employment while lowering emissions.

[5]For example, only about 1 percent of employment is in the utilities sector (energy and water/sewage; the sector with the highest average emission intensity) on average for a sample of advanced economies (Online Annex Figure 3.2.1 sample). See the next section for further discussion.

However, the transition may entail considerable challenges for individuals. Although more green- and pollution-intensive jobs are on average concentrated among a smaller subset of workers, the extent of labor reallocation required will vary according to country and within-country regional characteristics (see Box 3.1 for evidence on the geographic distribution of the environmental properties of jobs in the United States). Areas that rely more heavily on higher-emissions-intensive production will have a larger reallocation need and a potentially tougher transition.[6]

The analysis demonstrates that it is difficult for any given individual to switch to a greener occupation, which should temper any inference that the transition will be easy. This is especially the case for lower-skilled workers, which highlights the importance of including well-designed training programs in the policy package.[7] More broadly, occupational switches are not easy.

Some important caveats to these analyses need stating. First, because of data limitations, the green and pollution intensities assigned to occupations in the empirical analysis are invariant over time. However, employment could become greener without reallocation across occupations if technological changes increased green intensities and decreased pollution intensities by occupation. Second, the empirical results are derived using a sample composed largely of advanced economies, which makes the results less applicable to the typical emerging market or developing economy, in particular, one with a large share of informal employment. Third, even when the analysis of the empirical effects of policies takes place at the individual level, omitted variables may still be a concern, which suggests that the empirical policy-related results should be interpreted as associational rather than causal. More generally, the empirical analysis relies upon historical patterns in the data to assess policy effects, which may not be representative of the size and mix of policy changes needed to achieve net zero emissions.

With the flexibility of its calibration and incorporation of technological change, the model-based analysis attempts to address these shortcomings of the empirical analysis. However, it too comes with limitations. If there were a mismatch in the timing of the destruction of more pollution- and emissions-intensive jobs and the creation of greener jobs, then there could be a rise in unemployment over the near term. The model used here is one of structural transition with a labor supply decision and does not incorporate involuntary unemployment. That said, the model does account for structural changes in the skills of the workforce (improved by training), which may well help ease the adjustment over a longer period. Finally, the analysis uses a closed economy framework for simplicity and does not consider possible international spillovers from policy changes.[8]

Important factors outside the chapter's scope could complicate the transition to a greener economy. The scenario-based analysis assumes that policies are fully credible, transparently announced, and implemented in a timely manner. However, the risk is large that policy uncertainties and delays will continue—for example, as a result of political economy constraints.[9] With these uncertainties and delays, the transition will be more challenging and potentially require even sharper adjustment. Moreover, if the policy package is only partly implemented or its implementation is poorly sequenced, the transition could exacerbate income inequality and net employment losses.

The chapter begins by defining the environmental properties of jobs and documenting their incidence and distribution. It also explores how these properties vary with worker characteristics. The chapter then turns to individual-level job transitions and how they change with the environmental properties of jobs (source or destination). In the penultimate section, the chapter analyzes how environmental policies can help green the employment landscape, how policy effectiveness may vary with labor market policies and structural features, and the content and shape of a policy package to make the green transition.

[6]For example, see Online Annex 1.6 to the October 2019 *Fiscal Monitor* for a study of regions that are heavily dependent on coal.

[7]In a meta-analysis, Card, Kluve, and Weber (2018) find that training programs have typically positive medium-term impacts on participants' prospects. Specific program design elements, which must be calibrated to the country and regional context, also affect cost and success. See Levy Yeyati, Montané, and Sartorio (2019) for recent findings. Although there has been particular interest in developing skills for a greener economy (OECD and Cedefop 2014), there are no comprehensive evaluation studies on such specific training aspects.

[8]See Chapter 3 of the October 2020 WEO, which takes a global perspective in its examination of activity and does incorporate the possible international spillovers from climate mitigation policies.

[9]See the October 2019 *Fiscal Monitor* for a discussion about political economy concerns related to the green economic transformation.

Environmental Properties of Jobs: Definitions and Stylized Facts

This chapter takes the perspective that the environmental properties of jobs are multidimensional, examining them through two lenses: what workers do (their occupations) and where they work (their sectors). For the first lens, the chapter constructs an occupation-level measure of the *green intensity* of a job, based on the taxonomy of tasks and occupations from Dierdorff and others (2009) and O*NET Center (2021) and similar to that in Vona and others (2018). This measure is computed by occupation as the share of green tasks in total tasks in the work. The chapter also constructs an occupation-level measure of the *pollution intensity* of a job, building on the classification of Vona and others (2018), who identify polluting occupations as those particularly predominant in high-GHG-emitting and high-polluting sectors.[10]

As defined, the measures of green and pollution intensity each range continuously from 0 to 100 (expressed as a percent), with higher values indicating greener or more polluting occupations, respectively. It is possible for an occupation to be neither green- nor pollution-intensive (both measures are zero). The chapter refers to these as *neutral* occupations, and they account for the bulk of jobs.

For the second lens, the chapter matches information on the sectors in which people are employed with the emissions intensity (in total tons of carbon dioxide emitted per worker) by sector and country. Higher-emissions-intensive sectors include utilities, mining, and manufacturing.[11]

A natural question is how these environmental properties of jobs relate to each other, as they each capture a different environmental dimension of a given job. The green and pollution intensities of employment show a negative relationship to each other within the sample of employed workers, reflecting a general property that more green-intensive occupations tend to be less polluting. More pollution-intensive jobs are positively related to jobs in more emissions-intensive sectors.[12] Taken together, these findings provide reassurance that the three environmental properties of jobs are sensibly associated with each other.

Higher Green, Pollution, and Emission Intensities Are Concentrated among a Small Subset of Workers

For the sample of economies analyzed, the average employment-weighted green intensity of occupations ranges from about 2 to 3 percent for most economies in the sample, while the average employment-weighted pollution intensity is between about 2 and 6 percent (Figure 3.2, panels 1 and 3). Many jobs have very low green and pollution intensities: most are neutral (Figure 3.2, panels 2 and 4). Despite the urgency of the climate change threat, the rise in average green intensity and fall in average pollution intensity over the past decade have been incremental.

On the other hand, the emissions intensity of employment has fallen noticeably over the same period for the economies in the sample (Figure 3.2, panel 5). As noted, this partly reflects labor reallocation from higher- to lower-emissions-intensive sectors. In fact, the average share of employment in the higher-emissions-intensive sectors of mining, manufacturing, and utilities fell from about 18 percent in 2005 to 15 percent in 2015. While the median individual-level emissions intensity for the average country within the sample stood at about eight tons of carbon dioxide per worker in 2015, there is a substantial right skew in the average employment distribution, indicating that there is only a small share of workers involved in activities generating high carbon emissions (Figure 3.2, panel 6).[13]

[10]See Online Annex 3.1 for details on the construction of these indices and examples of selected occupations and their associated scores. Both green and pollution intensities take underlying inputs from the US occupational classification system, which are cross-walked to the international standard occupational classification system with employment weights. Green intensity is the average employment-weighted share of green tasks in total tasks in an international standard occupation. Pollution intensity is interpreted as the average employment-weighted share of polluting activities in an international standard occupation.

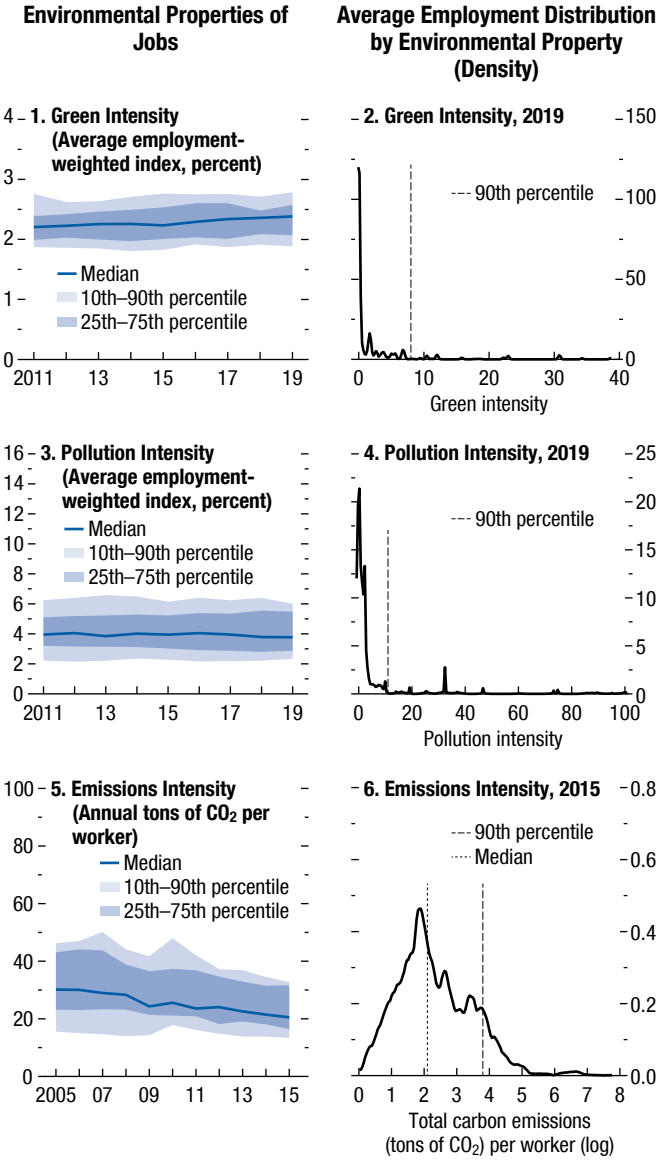
[11]See Online Annex 3.1 for a description of the calculation of sectoral emissions intensity and the underlying emissions data.

[12]See Online Annex 3.1 for the underlying analysis of these relationships across measures.

[13]Other measures or definitions could generate different conclusions. For example, a broader definition that includes jobs that could see increased demand during a green transition while not actually involving green tasks themselves and that does not distinguish between jobs that are more versus less heavily affected (a simple binary classification) could generate a larger share of employment. For example, Bowen, Kuralbayeva, and Tipoe (2018) apply such a broader definition and calculate that almost 20 percent of employment in the United States is green. See also ONEMEV (2021) for its classification of the green economy in France. It finds that about 0.5 percent of employment is green, while another 14 percent is "greening" in some way. See also IMF (2022).

Figure 3.2. Cross-Country Distribution and Evolution of Green- and Pollution-Intensive Occupations and Carbon Emissions per Worker

Although it has risen slowly over recent years, green intensity remains low on average, indicating further scope for greening. Pollution intensity has declined marginally, while emissions intensity has fallen about one-third, on average.



Sources: EU Labour Force Survey; IMF, Climate Change Indicators Dashboard; International Labour Organization; National Institute of Statistics and Geography (INEGI) (Mexico), National Survey of Occupation and Employment; Occupational Information Network; Organisation for Economic Co-operation and Development; Statistics South Africa, Quarterly Labour Force Survey; US Census, Current Population Survey; Vona and others (2018); and IMF staff calculations.
Note: Panels 1 and 3 are computed as the share (percent) of occupational tasks in the total economy that are green-intensive and the share (percent) of occupations that are pollution-intensive, respectively, weighted by employment for each country. Panel 5 exhibits carbon emissions intensity for the average worker by country. Data are shown over the time periods for which they are available. Panels 2, 4, and 6 show the average kernel density for employment (see Silverman 1986). See Online Annex 3.1 for details on country samples.

Labor Reallocation Can Strengthen the Green Transition

The green intensity of occupations varies across sectors, with that in industrial sectors higher on average, but sectoral averages are generally low (Figure 3.3, panel 1). Industrial sectors are also typically more pollution-intensive, but with averages notably higher in a few sectors, such as mining, manufacturing, and energy production (Figure 3.3, panel 2).

There is also wide dispersion in green and pollution intensities within sectors, as shown by the whiskers in the panel. This illustrates that there can be substantial within-sector differences in how green- or pollution-intensive workers' jobs are.

For a given sector, large differences in emissions intensity can be seen across countries, reflecting wide variation in technology and efficiency across countries (Figure 3.3, panel 3). Overall, these results highlight the substantial potential to "move up the green ladder" or "down the pollution ladder" within and across sectors.

Higher-Skilled and Urban Workers Tend to Have More Green-Intensive and Less Pollution-Intensive Occupations

Further greening of the labor market is easier if workers already have the skills needed in more green-intensive jobs. Higher-skilled workers tend to be in occupations with higher green and lower pollution intensities than lower-skilled workers (Figure 3.4).[14] Among other demographic characteristics, urbanicity stands out: urban workers tend to have occupations with higher green and lower pollution intensities than rural workers. At the same time, there is no statistically significant difference between the average emissions intensities of urban and rural workers.

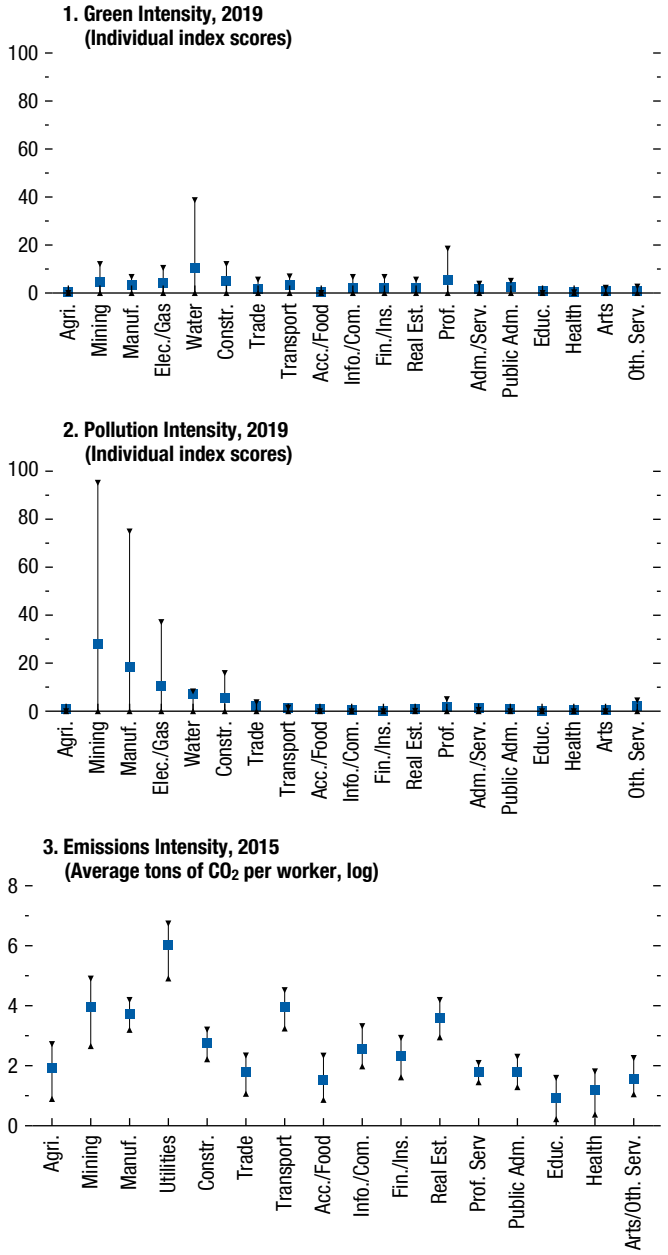
Average Green-Intensive Job Earns More Than the Average Pollution-Intensive Job

Even after an individual's skill level and other demographic characteristics are controlled for, the average green-intensive job commands earnings almost 7 percent higher than the average

[14]Online Annex 3.2 presents evidence that general green skills (skill categories most highly associated with green-intensive employment) are relatively evenly distributed across sectors. The wide dispersion within sectors and the similar levels across sectors suggest that further greening of the economy without massive skill changes at the macroeconomic level may be possible.

Figure 3.3. Sectoral Differences in the Distribution of Green, Pollution, and Emissions Intensities in Employment

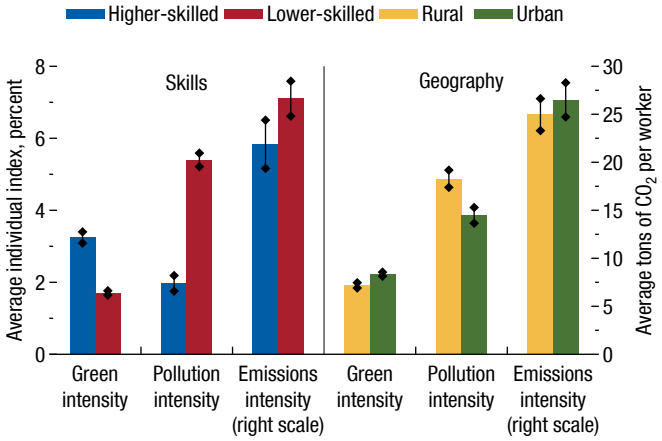
There is substantial room to boost green intensity in economies by reallocating workers away from highly polluting occupations both within and across sectors.



Sources: EU Labour Force Survey; International Labour Organization, ILOSTAT database; IMF, Climate Change Indicators Dashboard; National Institute of Statistics and Geography (INEGI) (Mexico), National Survey of Occupation and Employment; Occupational Information Network; Organisation for Economic Co-operation and Development; Statistics South Africa, Quarterly Labour Force Survey; US Census, Current Population Survey; Vona and others (2018); and IMF staff calculations.
Note: Squares represent the mean for the sector across individuals in the sample, while whiskers represent the 10th–90th percentile range. Sectors are classified according to International Standard Industrial Classification Revision 4. See Online Annex 3.1 for details on the country sample for the charts and definitions of the abbreviations used.

Figure 3.4. Environmental Properties of Jobs by Worker Characteristics

Higher-skilled workers' jobs are more green- and less pollution-intensive; pollution-intensive jobs are more concentrated in rural areas.



Sources: EU Labour Force Survey; IMF, Climate Change Indicators Dashboard; National Institute of Statistics and Geography (INEGI) (Mexico), National Survey of Occupation and Employment; Occupational Information Network; Organisation for Economic Co-operation and Development; Statistics South Africa, Quarterly Labour Force Survey; US Census, Current Population Survey; Vona and others (2018); and IMF staff calculations.
Note: The bars show the averages for the property over the employment-weighted sample of individuals with the characteristic indicated. Lower-skilled workers have at most secondary and nontertiary education or below, while higher-skilled workers have postsecondary or tertiary education. Whiskers depict the 90 percent confidence band around the estimates.

pollution-intensive job (Figure 3.5).[15] This premium has trended slightly upward in recent years, potentially helping to provide incentives for the transition toward a greener economy.

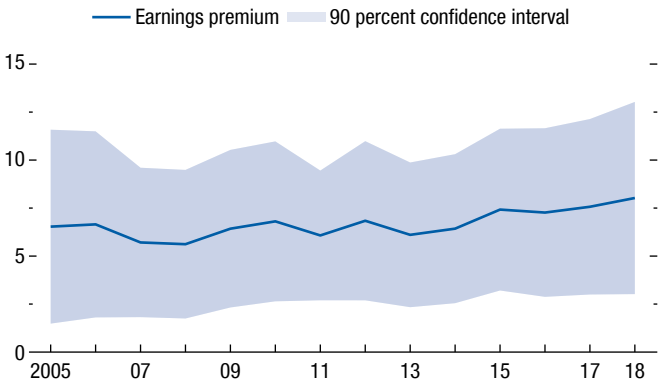
Environmental Properties of Job Transitions

This section investigates how easily workers move into greener jobs, examining individual-level job transitions. These transitions include such changes as an unemployed person's finding a job, an employed person's separating from a job, and changes in occupation or the sector in which a person works. As benchmarks, an average of about 8 percent of workers a year switch to a new job while employed or "on-the-job" for the countries in the sample used in this chapter, while about 52 percent of those who were out of work the previous year (either unemployed or not participating)

[15]See Online Annex 3.3 for details on the earnings premium. The findings are similar to those of Vona, Marin, and Consoli (2019) for the United States.

Figure 3.5. Earnings and the Environmental Properties of Jobs
(Percent)

The average green-intensive job commands a small earnings premium relative to the average pollution-intensive job, even when skill levels are controlled for.



Sources: EU Labour Force Survey; Occupational Information Network; Organisation for Economic Co-operation and Development; US Census, Current Population Survey; Vona and others (2018); and IMF staff calculations.
Note: See Online Annexes 3.1 and 3.3 for details on the country sample and the estimation of the earnings premium.

find new jobs in the current year (Figure 3.6, panel 1). About 6 percent of workers separate from (leave) their job each year.[16]

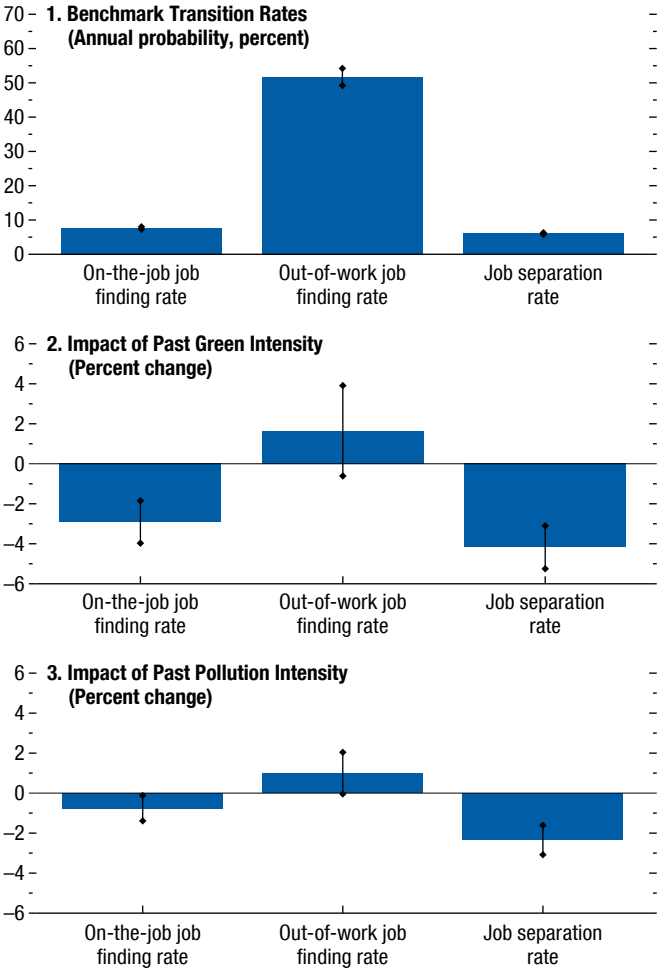
Green-Intensive Jobs Exhibit Less Churn Than Pollution-Intensive Jobs

Both green- and pollution-intensive jobs see less churning—fewer transitions—than neutral jobs. Workers with either more green- or more pollution-intensive jobs have lower on-the-job transition rates than those with neutral jobs (Figure 3.6, panels 2 and 3). Out-of-work individuals with a history of more green- or pollution-intensive employment also appear to find jobs more easily than those previously employed in neutral jobs, although this difference is not statistically significant. Finally, workers who previously held more green-intensive or more pollution-intensive jobs are also less likely to separate from their jobs than those who previously held neutral jobs. Taken together, these results suggest that workers in nonneutral jobs have greater job stability on average, with those with more green-intensive jobs the most stable.

[16]These rates are similar to those found in the literature. See Elsby, Hobijn, and Şahin (2013) and Hobijn and Şahin (2009), among others.

Figure 3.6. Job Transition Rates and the Environmental Properties of Past Jobs

Workers in more green- and pollution-intensive jobs enjoy greater job security on average, with more green-intensive jobs having the greatest stability.



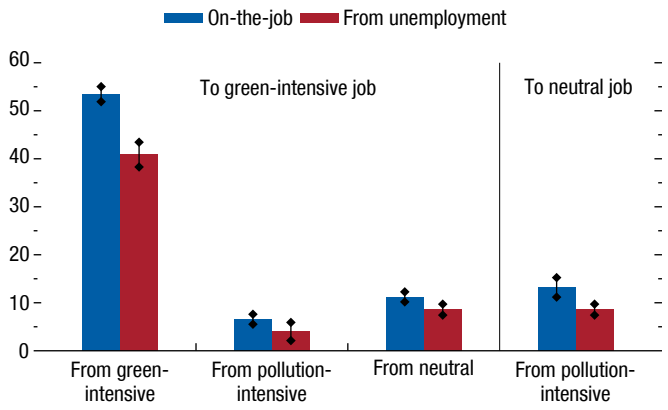
Sources: EU Statistics on Income and Living Conditions; US Census, Current Population Survey; and IMF staff calculations.
Note: In panel 1, each bar shows the estimated average transition rates in our sample. In panels 2 and 3, each bar shows the indicated average transition rate in the sample. The whiskers depict the 90 percent confidence intervals around the estimated coefficients. The differences between more green- and pollution-intensive jobs are statistically significant for job-to-job finding and job separation rates. See Online Annexes 3.1 and 3.4 for details on the country sample and estimation.

Environmental Properties of Jobs Are Sticky, and Transitions Can Be Tough

Zooming in on transitions into more green-intensive jobs, workers already employed in such jobs are highly likely to find work of a similar nature in a transition, with finding rates from unemployment or on-the-job of 41 and 54 percent, respectively (Figure 3.7). By contrast,

Figure 3.7. Annual Probability among Job Switchers of Transitioning into a Green-Intensive or Neutral Job
(Percent)

Moving from a more pollution-intensive or a neutral job to a more green-intensive job is more difficult than moving from one green-intensive job to another.



Sources: EU Statistics on Income and Living Conditions; National Institute of Statistics and Geography (INEGI) (Mexico), National Survey of Occupation and Employment; Occupational Information Network; US Census, Current Population Survey; Vona and others (2018); and IMF staff calculations.
Note: Probabilities are calculated based on transitions across three job types among individuals switching jobs. For the discrete state transition probabilities exhibited in this figure, a job is defined to be green-intensive if its green intensity is positive and its pollution intensity is zero; likewise, a job is defined to be pollution-intensive if its pollution intensity is positive and its green intensity is zero. A job is defined to be neutral if its green and pollution intensities are both zero. Whiskers depict the 90 percent confidence band around the estimates. See Online Annexes 3.1 and 3.4 for details on the sample and estimation.

it is not as easy for workers in pollution-intensive and neutral jobs to move to more green-intensive jobs. The probability of moving from a pollution- to a green-intensive job when transitioning is between 4 and 7 percent. For workers coming from neutral jobs, the rates are slightly higher, ranging from 9 to 11 percent. Although it is somewhat easier than moving into green-intensive jobs, workers with more pollution-intensive job histories also find it difficult to move into neutral jobs, with rates around 11 percent. These results in part reflect how tough it is in general to change occupations.[17]

[17]The simple probabilities calculated here do not control for other worker characteristics. See Online Annex 3.2 for further analysis comparing job transitions across workers with differing employment histories after accounting for worker demographic characteristics, including skills. These findings show that the stickiness of the environmental properties of jobs and difficulties with job transitions are robust.

Labor Markets and Environmental Policies: Empirical and Model-Based Analyses

As discussed, the green economic transformation necessary to respond to climate change will likely mean that employment must become more green-intensive and decrease its pollution and emissions intensities. However, and as just demonstrated, the environmental properties of jobs tend to be sticky, with workers finding it easier to move into occupations with properties similar to their previous occupations.[18] As it is tougher for workers with pollution-intensive or neutral job histories to move into more green-intensive work, an important question is whether policies can help increase (reduce) the share of green-(pollution-)intensive jobs in the economy and make worker reallocation easier to facilitate the green economic transformation.

To make progress in answering this question, this section first provides an empirical assessment of the relationships between a country's environmental policy stringency and the environmental properties of workers' employment. It then examines how a country's labor market policies and structural features may affect these relationships. However, recognizing that these empirical estimates rely on a composite index of the environmental policy stance and are associational rather than causal, this section then uses a newly developed task-based model of the labor market to study the content and shape of a policy package that can guide the economy through the green transition. By varying the calibration, the model allows the influence of country characteristics on policy effectiveness and the transition path to be evaluated.

Empirical Estimates of the Labor Market Effects of Environmental Policies

Expanding on the linear regression models of the environmental properties of jobs and job transitions, a variable capturing the stringency of environmental policies at the country level is introduced.[19] Although the estimation of the effects with individual-level

[18]This is consistent with more general findings regarding job transitions. Switching occupations is typically less likely than staying in the same occupational category when changing jobs (see Chapter 3 of the April 2021 WEO for further details and selected references).

[19]The policy variable of interest is the Organisation for Economic Co-operation and Development's composite index of the stringency of environmental policies, which combines a country's measures of carbon pricing and taxation, the extent of research and development spending on green technologies, and the stringency of environmental regulation, among other environmental policy instruments.

observations—which likely do not affect country-level policy settings—and the inclusion of various fixed effects provide some robustness, the findings should be interpreted as associational rather than causal. Moreover, only the statistically significant results are shown here.[20]

Policies Encouraging Greater Environmental Sustainability Help Green the Labor Market

The analysis suggests that more stringent environmental policies are associated with employment with higher green intensity and lower pollution and emissions intensities. Specifically, the findings suggest that a country that moves from the 25th to the 75th percentile in environmental policy stringency would see a 2 percent increase in its average green intensity of employment; its average pollution and emissions intensities would decline by about 4 and 6 percent, respectively (Figure 3.8, panel 1). In other words, policies that encourage greater environmental sustainability are statistically significantly related to greener employment.

This is in part a reflection of the impact of policies on job transitions. When environmental policies are more stringent, the average green intensity of newfound jobs among workers who switch while employed tends to be higher, and the average emissions intensity of these jobs tends to be lower. For a country shifting from the 25th to the 75th percentile in environmental policy stringency, among those who switch jobs while on the job, their destination jobs have about 4 percent higher average green intensity, while those jobs' average emissions intensity is about 2 percent lower (Figure 3.8, panel 2).

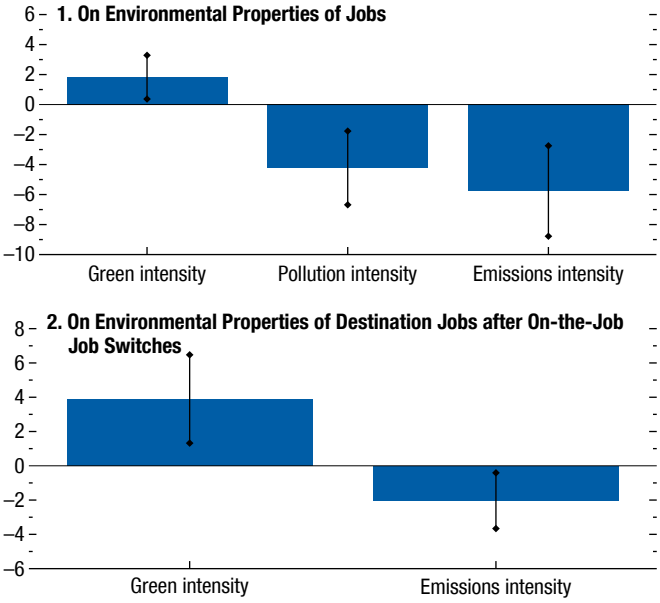
Economy-Specific Labor Market Policies and Structural Features Can Have an Impact on the Effects of Environmental Policies on Employment

These findings on the labor market greening effects of environmental policies point to their role in helping further the green transition. However, these average effects may mask the impacts of differences in countries' labor market policies and structural features on the effectiveness of environmental policies. This subsection attempts to unpack these effects by considering how they may be mediated by such country-specific characteristics. This is accomplished by adding interactions of environmental policy stringency with selected labor market policy and structural feature indicators to the linear regression analysis.[21]

The results suggest that labor market policies and features associated with reduced incentives for worker reallocation tend to dampen the effectiveness of environmental policies in greening the labor market (Figure 3.9).[22] In particular, higher spending on job

Figure 3.8. Estimated Effects of Environmental Policy Stringency
(Percent change)

More stringent environmental policies help green the labor market.



Sources: EU Labour Force Survey; EU Statistics on Income and Living Conditions; US Census, Current Population Survey; and IMF staff calculations.
Note: The panels show the average marginal effects of a country's moving from the 25th to the 75th percentile in environmental policy stringency on the indicated environmental properties, either among all employed workers (panel 1) or among destination jobs after on-the-job job switches (panel 2). The whiskers depict the 90 percent confidence intervals around the estimated effects. See Online Annexes 3.1 and 3.5 for details on the country sample and underlying regression specifications, respectively.

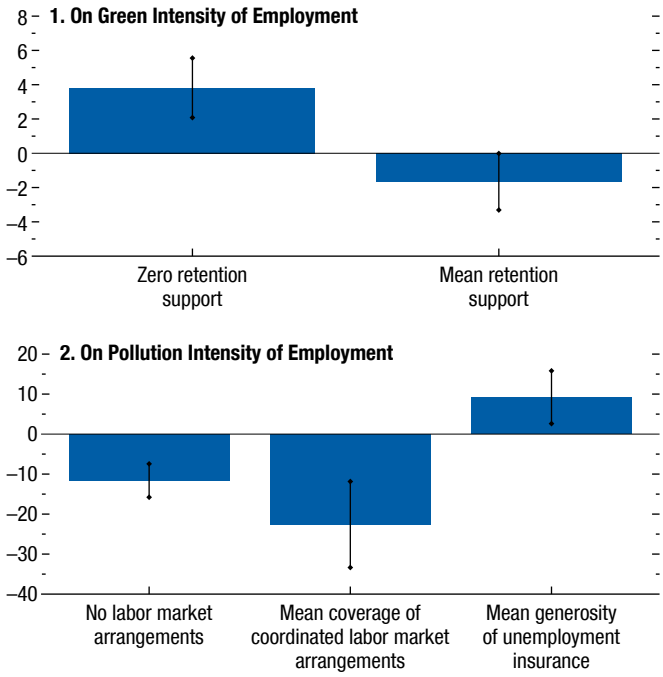
[20]See Online Annex 3.5 for further details on the regression specifications and set of outcome variables considered.

[21]As mentioned earlier, only statistically significant results are shown here. Other country-specific labor market policies and structural features were investigated but were not found to have statistically significant impacts on the effects of environmental policy stringency on the environmental properties of jobs or related job transitions. These included worker reallocation support measures, the stringency of employment protection regulation, and the stringency of product market regulation. See Online Annex 3.5 for further details.

[22]Other structural policies may also influence labor market greening through their effects on geographic allocation within countries. For example, eliminating nontariff internal trade barriers (through activities such as harmonizing occupational licensing within a country) could improve labor reallocation by easing regional labor movements (Alvarez, Krznar, and Tombe 2019; Hermansen 2020).

Figure 3.9. Estimated Effects of Environmental Policy Stringency Conditional on Labor Market Features
(Percent change)

The labor market effects of environmental policy stringency depend on labor market policies and features, particularly those that can inhibit or facilitate worker reallocation.



Sources: EU Statistics on Income and Living Conditions; US Census, Current Population Survey; and IMF staff calculations.
Note: The marginal effect of environmental policy stringency (EPS index) on the environmental properties of jobs is expressed as a percentage of the mean intensity for changes in the EPS index from the 25th to 75th percentiles of the cross-country distribution. The whiskers depict the 90 percent confidence interval around the estimated effects. See Online Annexes 3.1 and 3.4 for details on the country sample and the estimation.

retention support and more generous unemployment insurance are associated with declining effectiveness of environmental policies in spurring, respectively, greater green intensity and lower pollution intensity of jobs. Worker reallocation support (including spending on training programs) is not found to statistically significantly alter the effectiveness of environmental policies, which suggests that it has historically not been designed to support labor market greening. By contrast, the evidence suggests that environmental policies are more effective in reducing the pollution intensity of employment in countries with more coordinated labor market and collective bargaining arrangements. Why might this be the case? Such arrangements could help social partners—businesses, workers, and the government—coordinate on shared actions to support a green transformation as a common objective and ease any associated labor market adjustment.[23]

In summary, the empirical analysis suggests that more stringent environmental policies help promote a greener labor market. Moreover, they tend to be more effective when other labor market policies and features do not inhibit incentives for workers to reallocate and match to new jobs. However, endogeneity, the lack of granularity on alternative policy instruments, and the unprecedented nature of the climate change mitigation challenge argue for caution in extrapolating these empirical findings too broadly. The next subsection attempts to address such concerns through a model-based analysis of policies and their impacts on employment and worker welfare in the green economic transformation.

A Package of Policies for a Greener Labor Market: A Model-Based Analysis

This chapter uses a newly developed task-based, closed economy model to analyze the impact of granular policies on the green economic transformation. As in Acemoglu and Restrepo (2018) and Drozd, Taschereau-Dumouchel, and Tavares (forthcoming), production of goods takes place through the execution of fixed sets of tasks, which vary according to what is produced. Tasks are completed by labor (lower-skilled or higher-skilled) or capital, with varying degrees of cost and productivity. A producing sector's greenness depends on the kind and intensity of inputs used in production, with inputs and tasks varying in their green and pollution intensities (for example, a greener sector produces output with less polluting tasks). For simplicity, the model considers the production of two goods in two sectors that differ in their ultimate emissions intensity (higher/lower), as a function of their production technology and inputs employed.

Capital is used in the production of final goods by both sectors and can substitute for lower-skilled or higher-skilled labor in the execution of tasks, depending on how the relative productivity of capital evolves. However, capital investment requires output from the higher-emissions-intensive sector, similarly to what

[23]See Addison (2016) and Blanchard, Jaumotte, and Loungani (2014), among others, which describe how more coordinated and collective labor market arrangements may enhance an economy's ability to adjust to common shocks, particularly when there is trust among social partners.

might be expected for machinery and equipment investment. Hence, to grow the lower-emissions-intensive sector or support greater automation through investment, production in the higher-emissions-intensive sector may rise, at least temporarily.[24]

Importantly, the model allows for the effects of country-specific characteristics—such as a country's development level—to be assessed through scenarios. The model is calibrated first to a representative advanced economy and then to a representative emerging market economy, drawing on the literature and the empirical findings shown earlier for parameter values.[25] There are two main differences between these two economies: (1) the share of overall output coming from the higher-emissions-intensive sector is larger in the emerging market economy, and (2) the difference in the use of labor across the two sectors is larger in the emerging market economy, where production in the higher-emissions-intensive sector is even more reliant on labor. Across both economies, the share of lower-skilled workers in sectoral employment is greater in the higher-emissions-intensive sector.

Rises in the relative price of the higher-emissions-intensive good can shift demand and supply toward the lower-emissions-intensive good, leading to reallocation. This section considers a policy package designed to enable an economy to achieve net zero emissions by 2050 through a mix of productivity improvements and reallocation while smoothing the employment adjustment. Policymakers are able to credibly commit to the policy, enabling investors and workers to plan accordingly. Two elements of the package share similarities with the policies examined in Chapter 3 of the October 2020 WEO:

- An initial green infrastructure and research and development investment push is deployed in 2023 to support a modest productivity increase in the lower-emissions-intensive sector, reducing its production costs per unit of output.[26] Spending is slowly reduced after 2028.
- An ad valorem tax on carbon emissions is gradually phased in, starting at about 0.1 percentage point per year in 2023 and then rising by 1 percentage point per year from 2029 onward. This raises the relative price of the higher-emissions-intensive good, spurring reallocation and growth in the lower-emissions-intensive sector.

Compared with the earlier study, two new policy instruments are added to the package:

- A training program to facilitate the transition of lower-skilled workers to the lower-emissions-intensive sector is implemented from 2023. This raises the productivity of lower-skilled workers in lower-emissions-intensive work.[27]
- An earned income tax credit (EITC) program is set up to boost lower-skilled workers' incomes and stimulate their labor supply at the same time. This program starts in 2029, coincident with the carbon tax phase-in.

With this package of policies appropriately timed and tuned, the economy can be put on a green transition path and labor shifts smoothed out.

Advanced Economy Case

In the case of a representative advanced economy, the policy package generates a labor reallocation of about 1 percent of employment over the next 10 years, shrinking the higher-emissions-intensive sector and growing the lower-emissions-intensive sector (Figure 3.10, panel 1). For the group of advanced economies, the pace of the labor shift is smaller than the average shift of almost 4 percent per decade from industry to services sector employment since the mid-1980s. The package also promotes an increase in capital investment in the lower-emissions-intensive sector, while leading to a sharp fall in investment in the higher-emissions-intensive sector (Figure 3.10, panel 2).

When employment in each sector compared with its baseline is examined, the relative importance of the various policies becomes clear. The green investment push postpones the reallocation of workers initially (Figure 3.10, panels 3 and 4, blue bars), because the push requires capital goods produced by the higher-emissions-intensive sector. By contrast, the carbon tax acts as a price signal, promoting labor reallocation from the higher- to the lower-emissions-intensive

[24]Online Annex 3.2 shows that the gap in pollution intensity between routinizable and nonroutinizable jobs is about six times larger than that in green intensity, suggesting that greater automation could be associated with a greener labor market.

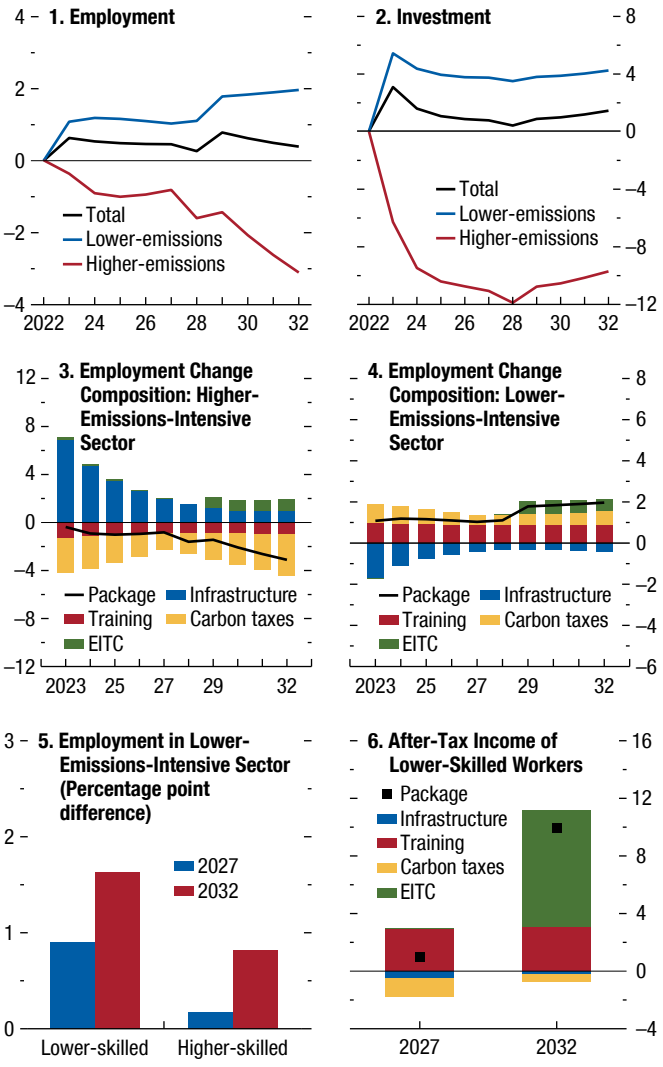
[25]See Online Annex 3.6 for further details, including selected structural and policy parameter calibrations.

[26]See the Online Annex 3.5 of the October 2020 WEO for discussion and more in-depth analysis of how research and development subsidies targeted to green innovation can facilitate the transition.

[27]See Online Annex 3.6 for details on the magnitude of the productivity boost from training. Empirical evidence on the positive effects of training programs supports the argument that training can improve employment prospects for (and reallocation of) targeted worker groups (Card, Kluve, and Weber 2018).

Figure 3.10. Model Simulations of the Green Economic Transformation with a Comprehensive Policy Package in an Advanced Economy
(Percent deviation from baseline, unless noted otherwise)

A comprehensive package with appropriate policy sequencing can bolster the economic and labor market transformations of the economy and labor market needed to achieve net zero emissions by 2050. Training programs and support for low-income workers are key elements for ensuring an inclusive green transition.



Source: IMF staff estimates.
Note: Results shown here are from a model calibrated to a representative advanced economy. The panels show the behavior of the indicated variable in response to a comprehensive policy package, relative to a baseline in which the package is absent. For panels 3 and 4, the effects of the package elements taken individually do not sum to the overall package effect because of interactions in general equilibrium. See Online Annex 3.6 for further details on the model, calibration, and simulations. EITC = earned income tax credit.

sector (Figure 3.10, panels 3 and 4, yellow bars). Moreover, despite the clearly communicated very gradual step-up of the carbon tax over time, businesses and workers anticipate its ultimate impact, starting some reallocation immediately. The training program also helps to promote labor reallocation but does so by making lower-skilled workers more productive in lower-emissions-intensive work (Figure 3.10, panels 3 and 4, red bars). This encourages their hiring by businesses in the lower-emissions-intensive sector and boosts the earnings of those who switch. Finally, the earned income tax credit expansion is not targeted to sectors but instead provides greater incentives for lower-skilled workers to boost their labor supply economy-wide (Figure 3.10, panels 3 and 4, green bars).

Overall, the package generates an increase in total employment of about 0.5 percent.[28] Both lower- and higher-skilled workers see higher employment in the lower-emissions-intensive sector, but lower-skilled workers see the largest boost (Figure 3.10, panel 5).[29] Moreover, the training and earned income tax credit programs result in an increase in after-tax income for lower-skilled workers, reducing inequality (Figure 3.10, panel 6, red and green bars).

Emerging Market Economy Case

As already mentioned, the emerging market economy case differs from the advanced economy case, given emerging market economies' typically larger shares of output and employment in higher-emissions-intensive production. An emerging market economy is also more likely to have a large share of its labor force in informal employment, which would not benefit from an earned income tax credit. The policy package is thus modified to include a cash transfer to lower-skilled workers. The cash transfer program is not targeted to workers in any specific sector but is available to all low-income (on average, lower-skilled) workers. It is implemented from 2029, alongside the carbon tax and earned income tax credit. Although the cash transfer program could lower income inequality, it could also reduce the incentive to

[28]This magnitude of the net employment change is closely related to the labor supply elasticity assumed (see Online Annex 3.6).

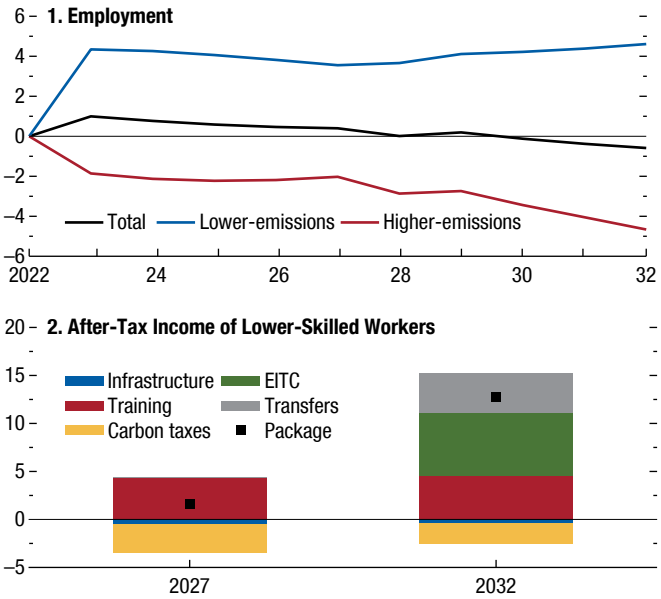
[29]The model findings imply that labor reallocation contributes about one-seventh of the emissions decline in the policy scenario, with the rest related to efficiency gains. This is a similar order of magnitude to the one-fourth share related to sectoral labor reallocation observed historically in Figure 3.1 for the average sample country over the 2005–15 period.

work, lowering the labor supply. This is an important difference compared with the earned income tax credit.

The policy package in the emerging market economy case generates a larger reallocation from higher- to lower-emissions-intensive sectors compared with the advanced economy case, with about 2.5 percent of employment shifting over 10 years (Figure 3.11, panel 1). The package affects employment through the same channels as earlier, but the initially larger share of employment in the higher-emissions-intensive sector means that a larger part of the economy is affected. There is an overall positive net employment effect in the near term from the investment push, but this changes to a 0.5 percent decline in employment by 2032. Similar to the effect in the advanced economy, the package boosts the income of lower-skilled workers. This comes from the package's mix of earned income tax credit, training, and cash transfers (Figure 3.11, panel 2).

Figure 3.11. Model Simulations of the Green Economic Transformation with a Comprehensive Policy Package in an Emerging Market Economy
(Percent deviation from baseline)

A similar package in an emerging market economy produces a larger labor reallocation. Lower-skilled workers in the emerging market economy benefit from the greener transition with the policy package.



Source: IMF staff estimates.
Note: Results shown here are from a model calibrated to a representative emerging market economy. The panels show the behavior of the indicated variable in response to a comprehensive policy package, relative to a baseline in which the package is absent. See Online Annex 3.6 for further details on the model, calibration, and simulations. EITC = earned income tax credit.

Conclusions

Reducing the profound downside risks from climate change calls for a green transformation of the economy: production structures must change to lower global GHG emissions. The externalities inherent in the production of emissions mean that policy actions are essential to provide incentives for the needed changes. This chapter investigated the labor market implications of such a green economic transformation, using a mix of empirical and model-based analyses.

The chapter began by quantifying the environmental properties of individual workers' jobs through three different metrics, reflecting how green, polluting, and carbon-emitting each job is. More green- and pollution-intensive jobs both appear to be concentrated among subsets of workers: economy-wide average green and pollution intensities are relatively low. Still, there is a wide dispersion of these environmental properties across and within sectors, suggesting the capacity exists for labor reallocation along both dimensions. Of particular note, industrial sectors tend to be simultaneously more green-, pollution-, and emissions-intensive than services.

Second, the chapter looked at the relationship between workers' demographic characteristics and the environmental properties of their jobs. It found that more green-intensive occupations tend to have higher-skilled and more urban workers, while the opposite is true for more pollution-intensive jobs. Importantly, even after skills are controlled for, green-intensive jobs exhibit an earnings premium—almost 7 percent—compared with pollution-intensive jobs on average.

Third, reallocation could be challenging for individual workers. The chapter found that a worker with a history of more pollution-intensive or neutral jobs is less likely to move into a more green-intensive job than to stay in pollution-intensive or neutral work. Higher skills do make for an easier match to a more green-intensive job, pointing to the importance of a worker's human capital in easing transitions.[30] Targeted and effective training programs to boost the human capital of lower-skilled workers in pollution-intensive or neutral occupations could help, by improving these workers' ability to move into more green-intensive occupations.

[30]See Online Annex 3.4 for discussion of how a worker's demographic characteristics are related to the environmental properties of jobs after transitions.

Fourth, environmental policies are effective in shifting employment toward greener jobs, but such policies work best in economies in which incentives for reallocation are not inhibited. This points to the importance of moving from job retention to measures that support worker reallocation as COVID-19 shifts from pandemic to endemic. Recent labor market dynamics indicate that greener employment was relatively more resilient during the COVID-19 recession (Box 3.2).

Critically, the model-based analysis suggests that the right policy package can put an economy on the path to net zero emissions by 2050 with moderate shifts in employment. Similar to that presented in earlier work, the package involves a green infrastructure push and carbon tax, but paired with two new elements to improve labor market functioning and address distributional concerns: a targeted training program to boost the productivity of lower-skilled workers in lower-emissions-intensive work and an earned income tax credit—which helps offset any consumption shock from carbon taxes for lower-income workers and incentivizes labor supply. Where informality in employment is high, the earned income tax credit should be supplemented with cash transfers for income support, targeted toward those most likely to be working informally.

For a representative advanced economy, the package entails technological and productivity improvements and a shift of about 1 percent of employment into the lower-emissions-intensive sector over 10 years. This package also buffers the unequal impacts of the carbon tax on low-skilled workers, reducing income inequality. To provide some sense of the magnitude of this shift, it involves a smaller labor reallocation than the average shift of almost 4 percent of employment per decade from work in industrial to services sectors that has been observed in advanced economies since the mid-1980s.[31] With the earned income tax credit, the package actually helps boost total employment over the long term by about 0.5 percent.

For a representative emerging market economy, the employment shifts from the policy package are larger—about 2.5 percent—reflecting emerging market economies' initially greater shares of more emissions-intensive production and higher shares of lower-skilled workers. Employment increases over the near term, as the infrastructure boost draws workers in, but then declines, ending up about 0.5 percent lower after 10 years. This reflects the need to rely more on cash transfers than the earned income tax credit to provide income support to the informally employed, translating into a smaller boost to labor supply. However, the package still improves income inequality.

Climate change mitigation actions will touch all aspects of the economy, many of which lie outside this chapter's focus on the labor market. Modest policy-induced technological and productivity improvements are critical for achieving net zero emissions without large output drops and large-scale labor shifts.[32] The green energy transition will also likely require extensive new capital investments, which could prove costly in the near term.[33] Within-country regional concentrations of more pollution-intensive occupations and higher-emissions-intensive production could mean that the burden of adjustment is shared unevenly geographically, particularly if policy measures to ease the transition (such as training programs and other reallocation support) are ineffectively implemented. Because of lack of data, the chapter was unable to delve into issues facing the agricultural sector, which are particularly important for many low-income developing countries. Finally, the chapter abstracted away from the international dimensions of climate change policies, in which potential leakages and cross-country spillovers argue for a global, coordinated approach.[34]

An overall picture emerges that the size of labor shifts required for the green transition is not unprecedented. That said, the exact size and speed of the needed reallocation will vary by country (and within country, by region), depending on the importance of higher-emissions-intensive production in the

[31]This employment shift may in part reflect reallocation as a result of automation, although measuring its exact contribution is difficult, and it likely varies by country (Acemoglu and Restrepo 2020; Dauth and others 2021).

[32]See Online Annex 3.6 for further discussion of the model's incorporation of technology and productivity improvements and their relative importance.

[33]Among others, see IEA (2021) for a recent discussion of the energy transition and capital costs. Capital investment increases are also needed to address climate change adaptation (Chapter 2 of the October 2020 *Fiscal Monitor*). For discussion of the magnitude of financing shifts required and how financial market regulation (including climate-related data standards and disclosures) can support the green transition and adaptation, see Chapter 5 of the April and October 2020 *Global Financial Stability Report* (GFSR) and Chapter 3 of the October 2021 GFSR.

[34]See Chapter 3 of the October 2020 WEO for an example of such a globally coordinated policy package and Chateau, Jaumotte, and Schwerhoff (2022) for mechanisms to facilitate international coordination.

local economy and whether policy actions to get on the net zero emissions path are delayed. From an individual-level perspective, the road appears rougher, as workers with pollution-intensive or neutral job backgrounds find it harder to move into more green-intensive jobs. Any policy package should thus include elements that aim to ease the transition for these workers—policies that enhance their employability, like well-designed training programs, and boost their ability to find new job matches—and ensure that the path to a greener labor market is a smooth and inclusive one.

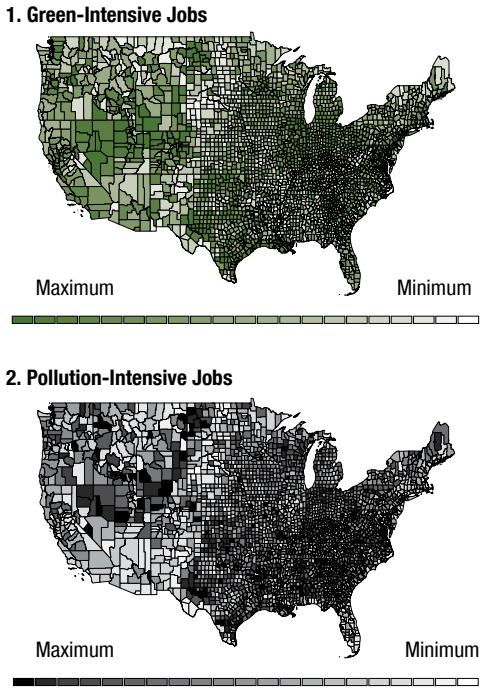
Box 3.1. The Geography of Green- and Pollution-Intensive Jobs: Evidence from the United States

The within-country distribution of green- and pollution-intensive jobs offers insights into the challenges of transitioning to a greener economy by region. If green-intensive jobs are also present in regions currently more reliant on more pollution-intensive employment, the green transition may require less geographic reallocation of workers. Depending on the country, the geographical distribution could also have political economy implications.

There are signs of geographic concentration of higher green and pollution intensities.[1] On average, jobs are more green-intensive in the US West and Southwest, with pockets of intensity in the Midwest (Figure 3.1.1, panel 1). Notable subsectors in regions with green-intensive jobs include research and development, engineering services, and aerospace manufacturing. Jobs have higher pollution-intensity in the Southeast and Southwest and are found especially in extractive industries, electric power (generation, transmission, and distribution), and wood and textile industries (Figure 3.1.1, panel 2).

Areas with more green- and pollution-intensive jobs tend to overlap. Geographic frictions can impede the green transition, especially if labor mobility is declining (Chapter 2 of the October 2019 *World Economic Outlook*; Dao, Furceri, and Loungani 2017). However, areas rich in green-intensive jobs tend to border on or overlap with pollution-intensive-job-rich areas. Of 173 US commuting zones rich in pollution-intensive jobs (above the 75th percentile), 125 either are also rich in green-intensive jobs (above the 75th percentile) or border a commuting zone rich in such jobs. This proximity does not guarantee the transition will be easy: policy measures such as effective training programs remain important. There are differences between areas with either more green- or more pollution-intensive jobs. More green-intensive jobs tend to be more urban, while more pollution-intensive jobs tend to be rural. Counties with a higher share of more green-intensive jobs also tend to have higher incomes, younger populations, a greater proportion of people with a college degree or more education, and lower unemployment. Unionization is negatively related to the share of pollution-intensive jobs but shows no relationship to green intensity.

Figure 3.1.1. Geographic Distribution of Green and Pollution Intensities across US Counties



Sources: US Bureau of Labor Statistics, Occupational Employment and Wage Statistics; US Census, County Business Patterns; and IMF staff calculations.
Note: These maps use a relative coloring scheme, such that greener (grayer) coloring means that employment is more green-(pollution)-intensive in a relative rather than an absolute sense. Estimates of green-(pollution)-intensive jobs combine three data sets: (1) definitions of green/polluting occupations (see Vona and others 2018), (2) industry-state occupational breakdowns from the Occupational Employment and Wage Statistics data set, and (3) county-industry employment (from County Business Patterns, as harmonized by Eckert and others 2021).

The authors of this box are Katharina Bergant and Rui Mano.

[1]Online Annex 3.7 provides further details on the data and analysis exhibited.

Box 3.2. A Greener Post-COVID Job Market?

Official labor force surveys can provide an in-depth picture of the evolution of greener employment. However, these surveys are usually published with lags, making it challenging to track whether the ongoing COVID-19 recovery has accelerated or decelerated labor market greening. High-frequency data from online job networking and search platforms can help provide timelier insights.

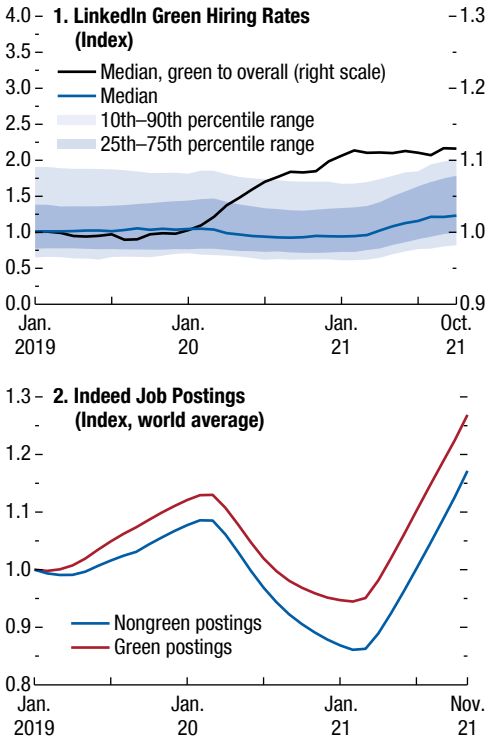
Recent patterns in hiring rates suggest greener jobs were relatively more resilient throughout 2020. Using self-reported worker profiles and expert judgments, LinkedIn identified green skills and categorized workers according to their "green talents."[1] Similarly to the motivation for the green intensity definition with respect to tasks used in this chapter, the classification reflects whether workers report skills that improve the environmental sustainability of economic activities (for example, pollution mitigation, waste prevention, and green energy generation and management). By using information on workers' employment changes, gross hiring rate indices can be computed to follow short-term hiring fluctuations. Hiring rates for green talent workers were better than that for all jobs in the early months of the pandemic and ticked up over 2021 as the recovery strengthened (Figure 3.2.1, panel 1).

Developments in job postings also suggest more resilient demand for greener workers. Although not linked to the green skills classification presented in the previous paragraph, job postings data from the online platform Indeed can be matched to sectors, which can in turn be categorized as having above- or below-average green intensities. Based on this split, world average green job postings declined less than nongreen postings during the pandemic (Figure 3.2.1, panel 2). This resilience was broad-based, as green sector postings experienced smaller declines in 28 of the 34 countries in the sample. Moreover, paralleling the pattern seen in hiring rates, bounce-backs in job postings have been similar in both green and nongreen sectors during the recovery. Overall, a picture emerges of some labor market greening early in the post-COVID recovery, which has now stalled.

The author of this box is Jorge A. Alvarez.

[1]See Online Annex 3.7 for further details on the LinkedIn and Indeed data sets.

Figure 3.2.1. Cross-Country Evolution of Green Hiring Rates and Job Postings



Sources: Indeed; LinkedIn; and IMF staff calculations.
Note: Panel 1 shows cross-country percentiles standardized to the median observed in January 2019. The hiring rate is a measure of hires normalized by LinkedIn membership. It is computed as the percentage of LinkedIn members who added a new employer in the same period the job began, divided by the total number of LinkedIn members in the corresponding location. The green hiring rate is computed considering only members classified as green talent. Workers are considered green talent if they have explicitly added at least one green skill to their profile, are occupied in a green occupation, or both. Panel 2 shows a cross-country 12-month average job postings index, standardized to January 2019. Green postings refer to postings on the Indeed platform associated with sectors that have above-average green skill intensity. See Online Annex 3.7 for further details.

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CHAPTER 4

GLOBAL TRADE AND VALUE CHAINS DURING THE PANDEMIC

When COVID-19 hit, the combined supply and demand shock was expected to lead to a dramatic collapse in trade. However, although trade in services remains sluggish, trade in goods bounced back surprisingly quickly. This chapter finds that factors specific to the pandemic played a key role in the rotation of trade from services to goods, above and beyond the impact on demand. Imports of goods fell by less and imports of services by more than can be explained by demand and relative prices. The pattern was more pronounced in countries where the pandemic—and associated containment policies—were more severe. Further, an examination of granular bilateral trade data reveals that international spillovers from lockdown-induced supply disruptions were a key driver of the decline in trade early in the pandemic. These negative spillover effects tended to be short-lived and were mitigated to the extent that telework was possible. Moreover, the spillover effects diminished over subsequent waves of the pandemic, suggesting adaptability and resilience in global value chains (GVCs). Indeed, with differences in the timing of pandemic outbreaks and containment policies across different regions, some regions with significant participation in GVCs were able to increase their share in the imports of other regions, but these changes also appear to be unwinding over time. In view of the overall resilience of global trade and value chains during the pandemic, this chapter argues that policies such as reshoring are likely misguided. Instead, supply chain resilience to shocks is better built by increasing diversification away from domestic sourcing of inputs and greater substitutability in input sourcing (easier switching of input supplies between countries). Increasing supply chain resilience is important for dealing with not only health emergencies like the pandemic, but also other types of shocks such as the war in Ukraine, cyberattacks, and extreme weather events related to climate change. While much of the work of building resilience must be undertaken by firms (as private sector actors), governments can still play a useful role by filling information gaps in supply chains, investing in trade and digital infrastructure, reducing trade costs, and minimizing policy uncertainty. Widespread vaccination will be crucial to mitigating spillovers from future shocks related to the spread of COVID-19.

This chapter was prepared by Ting Lan, Davide Malacrino, Adil Mohommad (lead), Andrea Presbitero, and Galen Sher, under the guidance of Shekhar Aiyar, and with support from Shan Chen, Bryan Zou, Youyou Huang, and Ilse Peirtsegaele. It includes contributions from Mariya Brussevich, Diego Cerdeiro, Andras Komaromi, Yang Liu, Chris Papageorgiou, and Pauline Wibaux. Andrei Levchenko was a consultant for the project.

Introduction

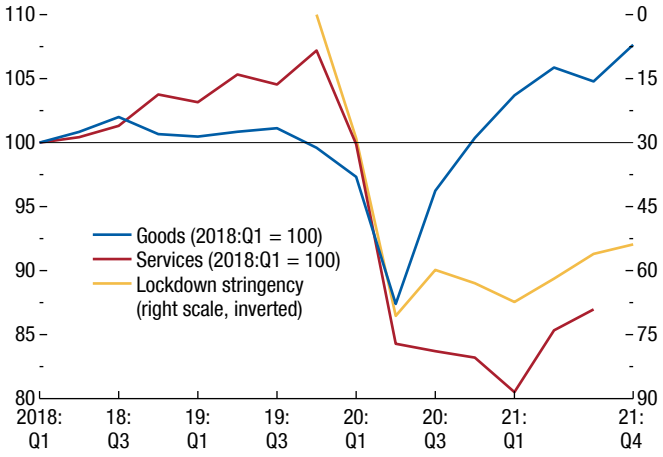
With the onset of the COVID-19 pandemic, trade collapsed in a dramatic fashion. At its trough in the second quarter of 2020, the volume of global trade in goods fell 12.2 percent, and trade in services fell even more sharply, by 21.4 percent, compared with the last quarter of 2019 (Figure 4.1). However, the recovery in trade was also surprisingly quick, compared with the much more protracted recoveries after other global recessions (Figure 4.2) (Baldwin 2020). Trade in goods had recovered to pre-pandemic levels by October 2021—a very rapid rebound compared, for example, with that from the global financial crisis. However, the aggregate trends mask considerable heterogeneity, and further disruptions are likely, owing to the war in Ukraine.[1]

- Trade in services remains sluggish, driven mainly by the collapse of travel. Transport services appear to be recovering, although disruptions in seaborne trade remain elevated (see Komaromi, Cerdeiro, and Liu, 2022, on the evolution of delays in shipping). Trade in other services has been more robust (Figure 4.3), notably telecommunication services.
- Trade in goods that rely heavily on global value chains (GVC-intensive goods) was more volatile than that in other goods (Figure 4.4). Between January and April 2020, exports of GVC-intensive goods fell 30 percent, while exports of other goods fell by

[1]The analysis presented in this chapter was concluded in early 2022, prior to the outbreak of the war in Ukraine, and does not focus on it's implications for global trade and value chains.

Figure 4.1. Global Import Volume and Lockdown Stringency
(Index)

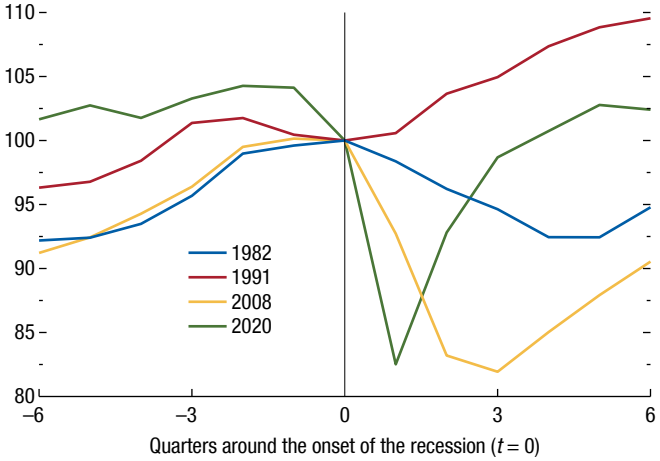
Goods trade recovered rapidly, although services trade remains sluggish.



Sources: CPB World Trade Monitor; Hale and others (2021); and IMF staff calculations.
Note: The lockdown stringency index is the world import-weighted average of the Oxford COVID-19 Government Response Stringency Index.

Figure 4.2. Trade Patterns around Global Recessions: Goods and Services Import Volume
(Index)

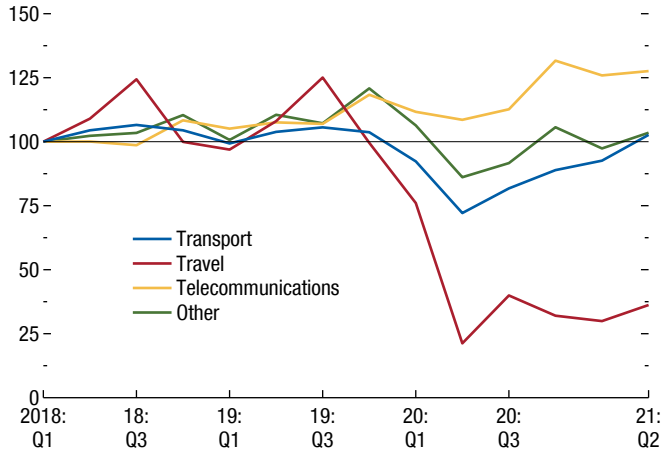
The recovery in goods trade was more rapid than in previous recessions.



Sources: Kose, Sugawara, and Terrones (2020); and IMF staff calculations.
Note: The goods and services import volume index is normalized to 100 at the onset of the recession ($t = 0$).

Figure 4.3. Imports of Commercial Services by Main Sectors
(Index, 2018:Q1 = 100)

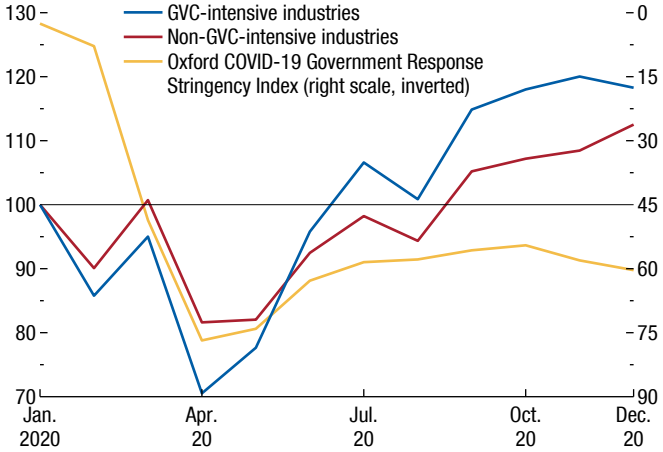
The decline in services trade has mainly been due to that in travel services.



Sources: World Trade Organization; and IMF staff calculations.
Note: "Telecommunications" comprises telecommunications, computer, and information services. "Other" comprises commercial, goods-related, construction, financial, insurance and pension, intellectual property, other business, personal, cultural, and recreational services.

Figure 4.4. Volatility of Trade in GVC-Intensive Industries versus Non-GVC-Intensive Industries Early in the Pandemic
(Index)

Trade in GVC-intensive industries was relatively more volatile than trade in non-GVC intensive industries.



Sources: Hale and others (2021); Trade Data Monitor; and IMF staff calculations.
Note: GVC = global value chain.

about 18 percent.[2] The recovery in GVC-intensive goods was also more rapid. The initial drop, however, was relatively more severe in some industries like automobiles, amid disruptions to key inputs such as semiconductors (see Box 4.1 for further details on the evolution of supply disruptions, including in automobile and semiconductor trade). Amid the volatility in trade among GVC-intensive goods, calls to explore policy options to increase GVC resilience to shocks have gained prominence.

Against this backdrop, this chapter first formally examines potential explanations for observed patterns in trade during the pandemic. In particular it asks three questions: (1) How well can trade patterns be accounted for by a standard model of demand and prices, compared with previous large recessions?; (2) What factors specific to the pandemic were important in determining the trade patterns?; and (3) What international spillover effects were generated by the mobility restrictions in response to the pandemic? These questions are investigated using an empirical framework based on standard models from the trade literature and relying on granular bilateral trade data at monthly frequency to examine spillovers.

The second set of questions in this chapter probes developments in GVCs and examines how to build up GVCs' resilience. It is difficult to paint a precise picture of changes in the structure of GVCs through the pandemic, given lags in high-frequency input–output data. Hence, the chapter tracks GVC developments as inferred from trade data. And in response to concerns about how well GVCs can weather global shocks, it examines options for increasing the resilience of the world economy in a modeling framework. Using a model that spans multiple sectors and countries, it examines the gains in resilience from (1) increasing the geographic diversification of input sourcing across countries and (2) increasing the substitutability of inputs across sources in different countries.

[2]GVCs are internationally distributed activities, such as design, production, and distribution, involved in bringing a product or service from conception to end use (Ponte, Gereffi, and Raj-Reichert 2019). Operationally, GVC trade has been defined to include trade in goods that cross at least two international borders (Hummels, Ishii, and Yi 2001). In this chapter, GVC-intensive goods are defined to include inputs and finished goods in the following industries: automobiles, electronics, textiles and garments, and medical goods. Together these goods account for about a quarter of global goods trade (in 2019), and are typically considered to be at the forefront of GVCs (Sturgeon and Memedovic 2010).

The main conclusions of the chapter are as follows:

- Factors specific to the pandemic had an important role in determining trade patterns. Goods imports were larger, and services imports were smaller, in 2020 than would be predicted by a model of import demand. Moreover, the deviations in actual trade from model predictions were much larger than in previous recessions. The "excess" goods imports were larger in countries with more severe pandemic outbreaks, more stringent containment policies, and larger declines in mobility. On the other hand, "deficit" services imports were larger where the pandemic was more severe.
- Lockdown policies to contain the pandemic had substantial—if unintended—international spillovers. Lockdowns in a country's trade partners on average accounted for up to 60 percent of the observed decline in imports in the first half of 2020. International spillovers were larger in GVC-intensive industries than in non-GVC-intensive industries, and they were larger in downstream (close to final user) industries than in upstream (input) industries. However, the ability to work from home (teleworkability) in partner countries mitigated the spillovers from lockdowns, and the effects also diminished over time. These findings on spillovers suggest two things. First, containing the pandemic domestically is important not just for domestic activity, but also because future outbreaks leading to lockdowns could have negative spillovers onto trade partners. Second, the reduction of spillovers over time, including for GVC-intensive goods, suggests that global supply chains were able to adjust. This should sound a cautionary note regarding policies seeking to effect permanent changes in the structure of global production and trade.
- GVCs were able to adjust to the asynchronous development of the pandemic, as reflected in changes in market shares among GVC regions during the pandemic. To further build resilience in GVCs, there is potentially substantial room to diversify away from domestic inputs. The chapter shows that resilience to shocks may be gained by further diversification of inputs across countries and by making inputs from different countries more substitutable. Diversification substantially reduces global GDP losses in response to shocks in key upstream suppliers. It also reduces GDP volatility following productivity shocks to multiple countries that are correlated, in line with what is observed in historical productivity data over the past 25 years. Reducing diversification, on the other hand, increases volatility. Greater input substitutability across

source countries reduces GDP losses from shocks in individual countries. Thus, it is important to find avenues to expand trade opportunities, which can boost resilience in the world economy in the face of a variety of shocks.

Drivers of Trade during the Pandemic

Demand and Relative Prices Alone Do Not Explain Pandemic Trade Patterns

Unlike previous global recessions such as that during the global financial crisis, changes in services and goods trade growth early in the pandemic are poorly explained by a model including conventional factors (domestic demand and relative prices) alone. Such a model performs well in explaining total trade but produces large forecast errors for goods and services import growth in 2020 when goods and services are considered separately. Moreover, these forecast errors are significantly correlated with pandemic-specific factors, pointing to the unique nature of this trade shock.

Here, a standard import demand model is used to estimate the historical relationship between demand and import growth. The model links real import growth of goods and services to growth in demand and the relative price of imports for a sample of 127 countries over 1985–2019.[3] Consistent with economic intuition and previous studies (see, for example, Chapter 2 of the October 2016 *World Economic Outlook*), the estimated coefficients on the measure of import-adjusted demand (a combination of demand components weighted by their import content, as in Bussière and others 2013) are positive for most countries and greater than 1. The coefficients on relative price are mostly negative and average between –0.2 and –0.3 (Online Annex 4.1).

Combining the estimates from the regressions—using world import shares as weights—yields good predictions of import growth up to 2019. Yet for 2020, the model underpredicts the large observed decline in services trade (the model predicts a growth rate of about –8 percent, while trade in 2020 actually fell by 25 percent). It overpredicts the fall in goods trade (predicting a 10 percent decline, against the 6 percent observed fall) (Figure 4.5).[4] The forecast errors are unprecedented in size; by contrast, the global financial crisis and the global recession of the early 1990s are much better explained by standard factors.

Figure 4.5. Average Forecast Errors of the Growth in Imports from the Import Demand Model
(Log points)

The large errors for 2020 show that conventional factors alone cannot explain the changes in goods and services imports.

Sources: Eora Global Supply Chain Database; IMF, *Balance of Payments Statistics*; and IMF staff estimates.

Pandemic Intensity and Containment Policies Were Key Drivers of Trade Patterns in This Crisis

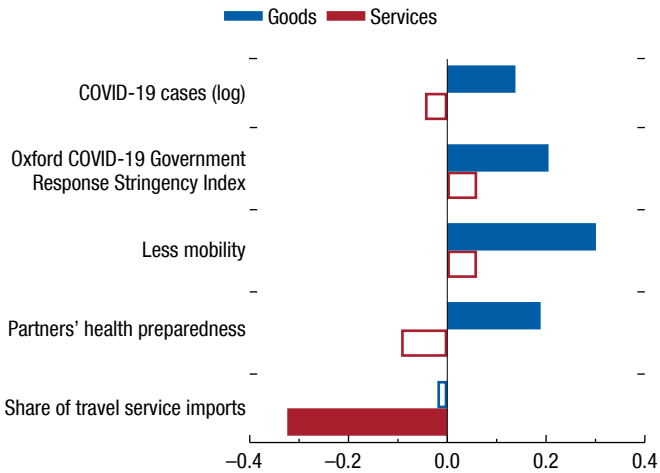
Several features of—and policy responses to—the pandemic are key to explaining the discrepancies between predicted and actual import growth. Relating the forecast errors to country-specific factors suggests that countries whose experience of the pandemic was more severe (more COVID-19 cases, more stringent containment measures, or less mobility) showed "excess import demand" for goods—that is, the fall in goods imports was smaller than predicted by the model (Figure 4.6). The forecast error for goods

[3]As explained in Bussière and others (2013), an import demand equation, which relates growth in real imports to changes in absorption and relative price levels, can be derived from virtually any international real business cycle model. In this chapter, the following empirical specification, $\Delta \ln M_{i,t} = \pi_i + \beta_{D,i} \Delta \ln D_{i,t} + \beta_{P,i} \Delta \ln P_{i,t} + \varepsilon_{i,t}$, in which $M_{i,t}$, $D_{i,t}$, and $P_{i,t}$ refer to imports, demand, and relative prices, respectively, in country i and time t, is estimated, together with other more parsimonious versions, as described in Online Annex 4.1.

[4]The performance of the model in 2020 is the worst since the beginning of the sample (1985) when metrics other than the average forecast error, such as the mean squared forecast error, are examined. Online Annex 4.1 discusses the distribution of errors in 2020, comparing it with that of previous years.

Figure 4.6. Factors Associated with the Demand Model's Forecast Errors for 2020
(Standard deviation, unless noted otherwise)

Domestic factors specific to the pandemic played an important role in determining trade patterns in 2020.



Sources: Global Health Security Index; Google, Community Mobility Reports; Hale and others (2021); Our World in Data; World Trade Organization; and IMF staff calculations.
Note: The figure reports standardized coefficients for a regression of residuals from the demand model on the listed variables. Solid bars show coefficients that are statistically significant at the 5 percent level; hollow bars show those that are not. Trade partners' health preparedness for the pandemic is measured by the Global Health Security Index. "Share of travel service imports" captures the share of travel services in a country's total service imports.

imports was 3 percentage points more positive for countries in the third quartile of the distribution of the number of COVID-19 cases than for those in the first quartile.[5]

For imports of services, the most important factor accounting for the model's overprediction is the extent to which a country imported travel services. That is, the unexplained portion of the fall in service imports was most pronounced in countries where travel services accounted for a large share of total service imports.

These findings are consistent with various conjectures regarding the impact of pandemic-specific factors on trade. First, the rapid recovery in goods trade may reflect a general switching in consumer spending away from services to goods—such as remote-working equipment and medical goods—created by pandemic-specific conditions.[6] Second, part of the shift could be driven by a simple reallocation of income toward goods because some services were unavailable. Third, it is possible that as countries with more severe lockdowns experienced a sharp contraction in the production of some goods domestically, they were pushed to import them instead (for the impact of lockdowns on domestic production, see Chapter 1 of the October 2020 *World Economic Outlook*).

Interestingly, the better the health-preparedness of an importing country's *trade partners,* the less its imports of goods fell relative to predictions. Trade partners' preparedness for the pandemic is measured here by the Global Health Security Index and is associated with more positive forecast errors for goods imports.[7] This suggests some degree of international spillovers; specifically, countries whose trade partners experienced smaller disruptions in domestic supply were less negatively affected by shock transmission in trade networks. Accordingly, the next section focuses on spillovers from lockdown policies in trade partners, which constitute supply shocks from a domestic perspective.

International Spillovers from Pandemic Containment Policies

Supply Shock Spillovers from Lockdowns Accounted for a Large Part of the Decline in Trade

The decline in imports at its trough in mid-2020 appears to be correlated with the stringency of lockdowns in exporting trade partners (Figure 4.7). Intuitively, tighter lockdowns in exporters would constitute a supply shock from the point of view of the importing country. Indeed, with demand factors controlled for, more stringent lockdowns in trade partners had a large and statistically significant negative impact on goods imports. A comparison of the actual evolution of imports between January and May 2020 against a counterfactual without any containment policies in place in trade partners indicates that containment policies accounted for up to 60 percent

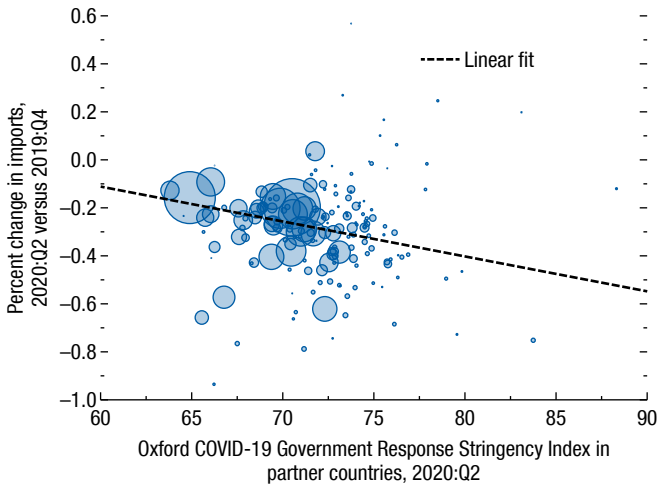
[5]If such disruptions are not fully incorporated by changes in the relative prices, in countries hit hardest by the pandemic, the model will predict a larger decline in the imports of goods than actually occurred.

[6]Among many studies confirming this trend, see Bounie and others (2020) for France; Andersen and others (2020) for Denmark; Baker and others (2020) for the United States; and Chronopoulos, Lukas, and Wilson (2020) for the United Kingdom.

[7]For details on the index, see Cameron, Nuzzo, and Bell (2019), as well as other material that can be found on the Global Health and Security Index website at https://www.ghsindex.org/about/.

Figure 4.7. Change in Imports and Partner Countries' Lockdown Stringency

Spillovers from the lockdown policies of trade partners are associated with lower imports.



Sources: Hale and others (2021); IMF, *Direction of Trade Statistics*; and IMF staff calculations.
Note: The Oxford Stringency Index in partner countries is constructed taking 2018:Q3–2019:Q4 import flows as weights. The size of each country's bubble is proportional to the value of its imports (in US dollars) in 2019:Q4. The solid line is a linear fit of a weighted regression of the change in imports between 2020:Q2 and 2019:Q4 against the Oxford Stringency Index in partner countries, in which the weights are the values of imports (in US dollars) in 2019:Q4. The estimated coefficient is equal to –0.015 (t-stat = –2.44).

of the observed decline in imports. That said, the spillover effect from lockdown stringency appears to have been short-lived. The impact first materialized in February 2020, with the first round of restrictions in Asia; grew in strength in March and April, when lockdowns became more geographically widespread, including in Europe; and started declining in May. In June, when goods imports rebounded strongly, even as the stringency of lockdowns eased only moderately, the spillover effects became indistinguishable from zero (see Box 4.2 for further evidence on the declining rate of spillovers, using data at daily frequency for seaborne trade).[8]

[8]Similar results are obtained by Berthou and Stumpner (2022). Heise (2020) also documents the close to 50 percent decline in US imports from China in March 2020 relative to January 2020, when factories were temporarily closed, before those imports bounced back in April 2020. Lafrogne-Joussier, Martin, and Mejean (2021) show that French firms sourcing inputs from China just before the lockdown experienced a drop in imports between February and April 2020 that was 7 percent larger than that of firms sourcing their inputs from elsewhere.

These findings are based on estimates of a gravity model employed widely in the trade literature (Santos Silva and Tenreyro 2006), using bilateral data on monthly imports at the six-digit product level from Trade Data Monitor.[9] The model includes a set of time-varying fixed effects that absorb the effects of all observed and unobserved factors specific to importing countries and industries, including demand shifts, and of factors such as trade agreements that could affect (product-specific) trade flows across each pair of importer and exporter countries. The methodology and results are described in more detail in Online Annex 4.2.

The spillover effect of lockdown stringency is also robust to controlling for the extent of the health crisis in the exporter country, measured by the number of new COVID-19 cases and deaths per capita (both contemporaneous and lagged), changes in export restrictions put in place by trade partners, and the fiscal policy response in trade partners.

Spillovers Were More Pronounced within GVCs and Were Mitigated by the Extent of Teleworking

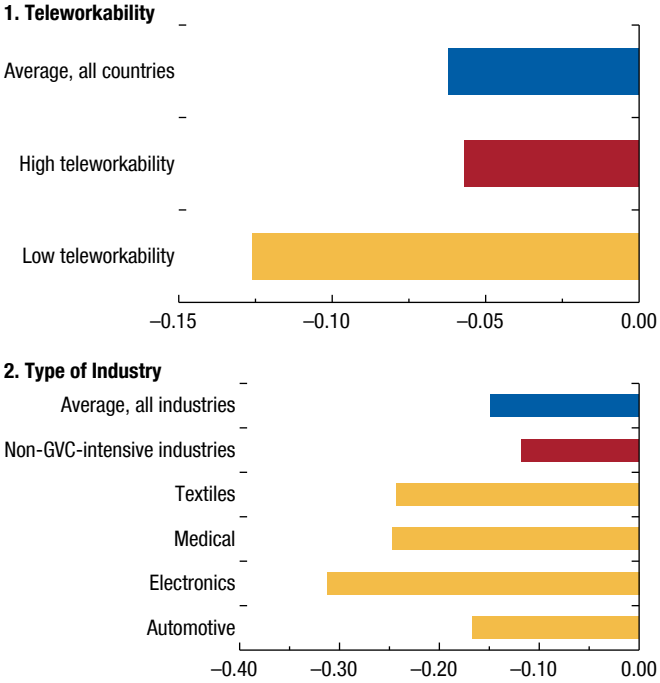
The average spillover effects mask several sources of heterogeneity.

- First, the spillover effect of lockdowns is more than twice as strong for countries whose exporting partners are less able to rely on remote working (Figure 4.8, panel 1). The finding is consistent with existing

[9]The chapter estimates the following specification: $M_{m,e,i,t} = g(\beta \textit{Stringency Index}_{e,t} + \delta \textit{Controls}_{m,e,t} + \alpha_{m,e,i} + \gamma_{m,i,t} + \varepsilon_{m,e,s,t})$. Bilateral imports of products in industry i ($M_{m,e,i,t}$) by importer country m from exporter country e in month t are regressed on (1) the time-varying index of lockdown intensity in the exporter country e (*Stringency Index*$_{e,t}$), measured using the monthly average values of the Oxford COVID-19 Government Response Stringency Index; (2) a set of variables that vary across country pairs and time (*Controls*); and (3) a set of fixed effects ($\alpha_{m,e,i}, \gamma_{m,i,t}$). The Oxford Stringency Index records the strictness of "lockdown style" policies that restrict people's behavior. It ranges from 0 to 100 and is calculated using eight ordinal containment and closure policy indicators (such as school and workplace closures) and restrictions on movement, plus an indicator recording public information campaigns. The stringency index used in this chapter is highly correlated with the component related to workplace closings, which has less variability, being a categorical variable (assuming four values). The model employed in the chapter considers an importing country (such as the United States) and compares its imports of a product (such as vehicles) in each month from trade partners with different containment policies. Under the plausible assumption that US demand for vehicles is the same across partner countries, the analysis controls for demand factors, including the role of domestic containment policies, and exploits only the variation in the intensity of lockdowns across trade partners.

Figure 4.8. Semielasticity of the Oxford COVID-19 Government Response Stringency Index

Spillovers were larger in GVC-intensive industries and among partner countries less able to rely on teleworking.



Sources: Dingel and Neiman (2020); Hale and others (2021); Trade Data Monitor; and IMF staff calculations.
Note: GVC = global value chain.

evidence showing that the feasibility of remote work mitigated the negative effects of reduced worker mobility (Pei, de Vries, and Zhang 2021).[10]

- Second, spillover effects are stronger in GVC-intensive industries (yellow bars, Figure 4.8, panel 2), and especially in electronics, than in non-GVC-intensive ones (red bar). Intuitively, imports in GVC-intensive industries would be relatively more exposed to disruptions in the supply chain (in this case resulting from lockdowns).[11]
- Third, the negative effect of stringency measures is dampened in industries that are more upstream in the production process (such as metals and minerals products), while it is stronger for those downstream (such as transportation and textiles).[12] A one-standard-deviation increase in the upstreamness index reduces the spillover supply effect of the lockdown by almost one-third. This is consistent with the intuition that downstream industries are more likely to be affected by disruptions to the supply chain, such as lockdowns in countries supplying intermediate goods used as inputs (see Box 4.3 for a detailed analysis using customs data from France).

To summarize, evidence from granular bilateral trade data shows that after demand in importing countries is controlled for, there were statistically significant negative spillovers from lockdowns in partner countries, consistent with findings in the literature (Espitia and others 2021; Berthou and Stumpner 2022). These spillovers were larger in GVC-intensive industries and in downstream industries. However, the spillovers tended to be short-lived and were mitigated to the extent that partner countries were able to use telework. Moreover, the spillover effects waned in magnitude over time, as countries gained experience with functioning under mobility restrictions; thus imports fell by much less in response to lockdowns in partner countries in 2021 than in 2020 (Box 4.2).

Resilience in GVCs

Trade Data Suggest That GVCs Adapted to Pandemic Conditions during the Crisis

The preceding analysis suggests that with the rotation in demand toward goods and the short-lived negative impact of spillovers from lockdowns, goods trade was resilient overall, including in GVC-intensive goods. The resilience of trade in goods can also be traced to the adaptability of GVC networks. Trade data show that there were sizable changes in trade market shares between regions with significant participation

[10]Teleworkability is measured using the cross-country data computed by Dingel and Neiman (2020). The sample of trade partners is split between those with a low share of jobs that can be performed remotely (the bottom quartile of the distribution) and those with a high share of teleworking.

[11]The six-digit product codes for goods in GVC-intensive industries are compiled from Frederick and Lee (2017) (electronics), Sturgeon and others (2016) (automobiles), and Frederick (2019) (textiles, medical devices).

[12]To test the upstreamness hypothesis, the model includes the interaction between the lockdown stringency index and a measure of industry "upstreamness" (the average distance from final use) computed by Antràs and others (2012) from a US input–output table. The (time-invariant) upstreamness of the industry is a measure of its exposure to the (time-varying) lockdown supply shock. This specification makes it possible to control for exporter-time effects, making the model fully consistent with gravity models that control for time-varying "multilateral resistance" factors.

in GVCs early in the pandemic.[13] With the asynchronous development of the pandemic, regions that exited lockdowns earlier experienced sizable increases in market share vis-à-vis other regions, especially in GVC-intensive industries. However, these changes in market shares appear to be reversing course over time, suggesting that they are unlikely to persist as countries learn to adjust to pandemic-related restrictions.

Asian countries, which were hit early by the COVID-19 shock but then managed to contain the virus—while other regions were experiencing surges in COVID-19 infections and lockdowns—gained market share compared with 2019; European and North American countries lost market share. By June 2020, "Factory Asia" countries increased their market share in GVC-intensive industries by 4.6 percentage points in "Factory Europe" and by 2.3 percentage points in "Factory North America."[14] Factory Europe is the regional bloc that lost the most during the first phase of the crisis (Figure 4.9, panel 1).

However, the most recent data, up to June 2021, show that the initial gains in market share for Factory Asia and the initial losses in market share for Factory Europe were both pared back during the recovery phase, suggesting that the change in market shares may be temporary. Factory North America continued to lose market share, predominantly within its own domestic markets (Figure 4.9, panel 2). To put these changes in a longer historical context, panel 3 of Figure 4.9 shows the evolution of Asia's market share in Europe since 2000, before China's accession to the World Trade Organization.[15] The gains in Asia's market by mid-2020 were large and quick relative to historical changes but also appear to be reversing rapidly.

[13]Because of lags in input–output data availability, granular analysis of changes in GVC participation is difficult. Bilateral trade data can thus shed some light on recent trends. For 2020, GVC participation metrics show that at the macroeconomic level, disruptions in supply chains led to a sharp reduction in GVC participation compared with 2019 (WTO 2021), especially in some sectors (such as transportation and electrical equipment).

[14]The classification of countries included in each of the three regional blocs follows Baldwin and Freeman (2020). Factory Asia comprises Australia, China, India, Indonesia, Japan, the Republic of Korea, and Taiwan Province of China. Factory Europe comprises France, Germany, Italy, the Netherlands, Spain, Switzerland, Turkey, and the United Kingdom. Factory North America comprises Canada, Mexico, and the United States.

[15]While China predominated in the increase in Asia's market share in Europe, changes in global market shares have seen winners and losers. Online Annex 4.3 shows that across countries, the increase in market share was positively correlated with an increase in mobility during the pandemic period.

Figure 4.9. Changes in Regions' Market Shares of GVC-Intensive Products

(Percentage points, unless noted otherwise)

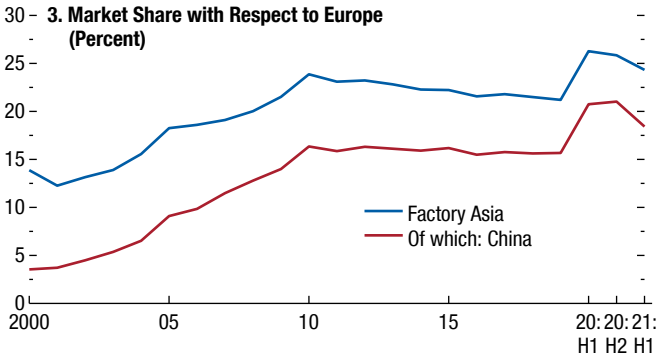
Changes in trade market shares during the pandemic indicate that GVCs adjusted to asynchronous lockdowns in different countries and regions.

1. 2020:H2 versus 2019

Importer regions \ Exporter regions	North America	Europe	Asia	Rest of the world
Rest of the world	–1.0	–0.8	1.8	0.0
Asia	–0.8	–0.8	1.3	0.3
Europe	–0.9	–1.9	4.6	–1.9
North America	–2.4	–1.4	2.3	1.5

2. 2021:H1 versus 2019

Importer regions \ Exporter regions	North America	Europe	Asia	Rest of the world
Rest of the world	–0.6	–1.7	2.1	0.2
Asia	–0.6	–0.6	1.1	0.1
Europe	–0.5	–2.3	3.1	–0.4
North America	–3.2	–0.8	0.6	3.4



Sources: Trade Data Monitor; and IMF staff calculations.
Note: Market shares are computed using only GVC-intensive products, as defined in the chapter. Panel 3 plots only the market shares of Factory Asia and China in GVC-intensive products with respect to Factory Europe, as defined in the chapter. GVC = global value chain.

Notwithstanding the overall resilience of GVCs, some industries such as automobiles have faced large supply disruptions. Moreover, shipping costs remain elevated along some routes despite having come down from their peaks, and some ports remain congested, contributing to continuing supply chain disruptions (Box 4.1; Komaromi, Cerdeiro, and Liu 2022). Other types of shocks—not just health emergencies, but also international or civil conflicts, cyberattacks, or extreme weather events associated with climate change—could also pose challenges (Baumgartner, Malik, and Padhi 2020; McKinsey Global Institute 2020). In this light, assessing options to strengthen resilience in GVCs is important, especially in view of growing calls to reshore production. The next section uses a model-based framework to analyze two options for building supply chain resilience that have been proposed in the literature: greater geographical diversification of input sources and greater substitutability of inputs from one source with inputs from another source (OECD 2021).

Policies to Boost Resilience: Insights from a Model-Based Approach

To analyze these options, this chapter extends the general equilibrium model of global production networks and trade proposed by Bonadio and others (2021). The model includes trade in intermediate goods (such as raw materials, parts, and energy that are produced by one firm and used in production by another firm) and services and thus captures global value chains.[16] Each sector in each country has a representative firm that produces using a technology characterized by constant return to scale. The model is calibrated to 64 countries and 33 sectors, as described in Online Annex 4.4. Note that the model does not feature endogenous input–output linkages and cannot speak to possible trade-offs between diversification and efficiency.

In the model, supply disruptions in source countries spill over to other countries through trade in intermediates. The analysis considers two scenarios: supply disruption in a single large input supplier country and supply shocks to multiple countries. It compares outcomes under high levels of diversification or substitutability with those under the levels actually observed. The precise sense in which these options are considered is as follows:

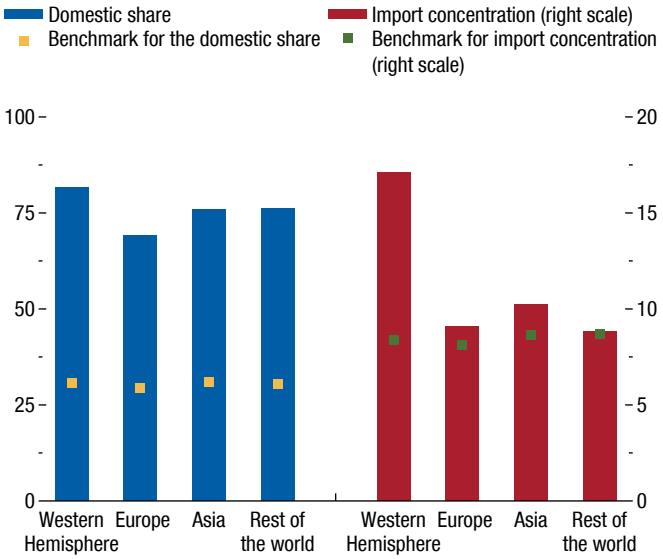
- *Diversification:* Countries could diversify their suppliers of intermediate inputs internationally, sourcing them in more equal amounts across countries. *Diversification* is a widely used term in economics (see, for example, Cadot, Carrère, and Strauss-Kahn 2013), but the meaning here is very specific. This chapter refers to diversification (1) across countries, not across products; (2) of intermediate goods and services, not final goods and services; and (3) of the use of intermediate inputs, not the production or export thereof. Diversification might enhance resilience by reducing reliance on a single country or by establishing relationships in good times that can be tapped during a crisis. In principle there could also be downsides to diversification. For example, diversification could expose a country to more volatile supplier countries. Empirical evidence to date on the benefits of diversification is mixed.[17]
- *Substitutability*: This refers to how easy it is in the production process for a producer to switch inputs from a supplier in one country with those from another country. While geographic diversification is about establishing relationships with suppliers in different countries, substitutability can be interpreted either as making firms' production technologies more flexible, in the sense that they can accommodate slightly different inputs of the same type from different suppliers, or as standardizing intermediate inputs internationally. An example of greater flexibility in production is Tesla's response to the semiconductor shortage. The company rewrote software to enable it to use alternative semiconductors that were more available at the time. As an example of standardization, General Motors recently announced that it is working with chipmakers to reduce the number of unique semiconductor chips that it uses

[16]In the model intermediate goods and services from one country are used as inputs into production in a second country, and then the resulting intermediate or final goods are exported to a third country. The model does not include inventory management and therefore cannot address risk mitigation options such as inventory management practices and their impact on trade (Alessandria, Kaboski, and Midrigian 2011).

[17]An emerging body of literature shows mixed benefits of diversification. Caselli and others (2020) find benefits at the national level of greater openness to overall trade (that is, exports and imports) and to trade in intermediate and final goods and services. At the firm level, Jain, Girotra, and Netessine (2015) find that diversification exposes firms to smaller suppliers that take longer to recover from a disruption, and Lafrogne-Joussier, Martin, and Mejean (2021) find negligible gains from diversification.

Figure 4.10. Room to Diversify the Sourcing of Intermediates
(Percent)

Substantial home bias in sourcing inputs suggests room for international diversification.



Sources: Organisation for Economic Co-operation and Development, Inter-country Input-Output Tables; and IMF staff calculations.
Note: Blue bars show the share of intermediates sourced domestically. Yellow squares show the benchmark concentration in world production. Red bars show the extent of import concentration (Herfindahl concentration index) across foreign countries within the share of intermediates that is imported. Green squares show the world exports concentration benchmark. See Online Annex 4.2 for details.

by 95 percent, down to just three families of microcontrollers. In principle, each family of microcontrollers would replace a host of chips, eliminating any costs of substituting among them.[18]

The evidence suggests that countries and sectors have substantial room to diversify away from domestic sourcing of intermediate inputs internationally. For example, the blue bars in Figure 4.10 show that on average, firms in the Western Hemisphere source 82 percent of their intermediates domestically, which is far above a benchmark of 31 percent that reflects the concentration of world production of these intermediates.[19] This points to a sizeable "home bias" in the sourcing of intermediates.[20] One important implication of this home bias is that any reshoring of production would *lower* diversification even further, thereby increasing concentration risk. This is a simple argument against reshoring. Fuller analyses of reshoring find that this increased concentration would indeed result in more volatile economic activity, even after the economy adjusts structurally by expanding some sectors and shrinking others (OECD 2021; Bonadio and others 2021).

In contrast, there is not much room to diversify further among inputs sourced from abroad, except in the Western Hemisphere (Figure 4.10). Therefore, the main scope for diversification is in diversifying away from domestic sources, by sourcing more intermediates from abroad. Online Annex 4.4 shows that the sectors with the greatest room to diversify are services industries such as hospitality, finance, and health care.

Greater diversification is modeled by constructing a simple average of (1) a distribution that sources from each country with equal weight and (2) the actual data. Effectively, the domestically sourced share is set to roughly half of what it is in the observed data.

To increase substitutability across suppliers in different countries, an increase in the elasticity of substitution between intermediate inputs from different countries from 0.5 to 2.0 is modeled, similar to the range found in Feenstra and others (2018).[21] The increase is equivalent to going from the short-term elasticity used by Bonadio and

[18]See, for example, "Ford Moves to Ensure Supply of Chips and Guide Their Design," *New York Times*, November 18, 2021 (https://www.nytimes.com/2021/11/18/business/ford-global foundries-chip-shortage.html). Note that if substitutability is achieved by standardization, then it might also carry the cost to producers that suppliers are less "locked in" and could more easily switch between producers.

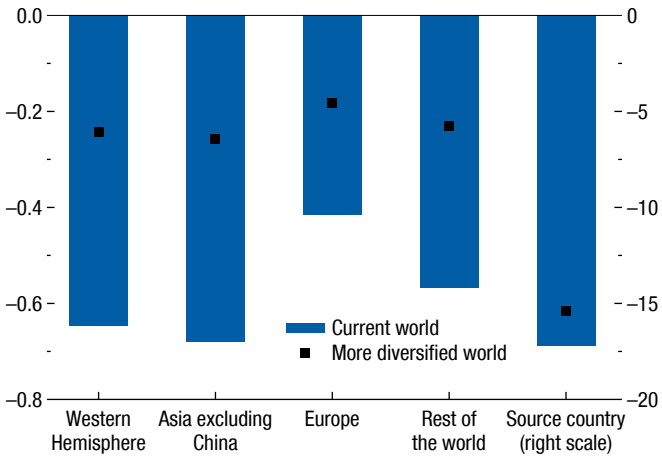
[19]This benchmark illustrates the limits on how much a firm can diversify its sourcing of intermediates in the short term. For each country-sector pair, the share of *domestically sourced* intermediates is compared with a benchmark for the concentration of world production of those intermediates. The concentration of *imported* intermediates is compared with a benchmark for the concentration of exports of those intermediates. For example, suppose the US motor vehicles industry uses two inputs, A and B, in equal parts. Suppose that the country producing the largest share of input A has a 20 percent share in world production and the country producing the largest share of input B has a 40 percent share. Then the benchmark concentration for domestic sourcing of these inputs, A and B, for the US motor vehicles industry is 30 percent (= (20 + 40)/2). The benchmark of 31 percent in the text then averages across all country-sector pairs in the Western Hemisphere. The room for diversification shown here may look different within more narrowly defined product categories.

[20]This is similar to the home bias identified in overall trade by McCallum (1995).

[21]This is an extension of the baseline model of Bonadio and others (2021), as explained in Online Annex 4.4.

Figure 4.11. Gains from Diversification Following a Supply Disruption in a Large Supplier Country
(Percent)

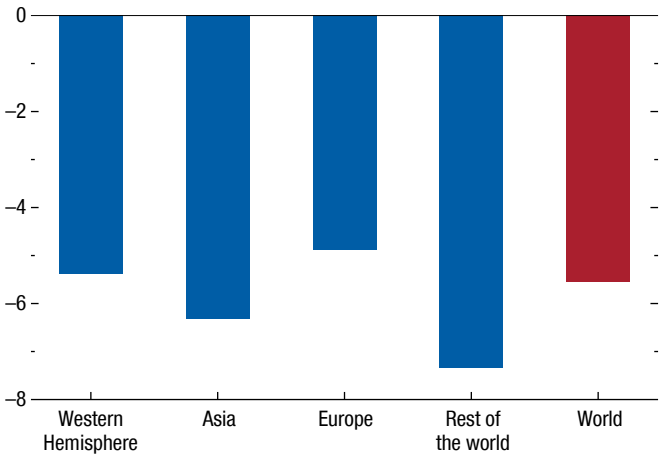
Greater diversification reduces GDP losses by almost half, on average, following a shock to a large input supplier.



Source: IMF staff calculations.
Note: The figure shows GDP declines in response to a 25 percent labor supply contraction in a country that is a large global supplier of intermediates. The bars and squares show simple averages of GDP declines across countries within each region. Elasticity of substitution = 0.5.

Figure 4.12. Gains from Diversification under Shocks to Total Factor Productivity
(Percent)

Greater diversification reduces the volatility of GDP by 5 percent under correlated total factor productivity shocks.



Source: IMF staff calculations.
Note: The bars show simple averages within each region of the percentage reduction in volatility. The shock is calibrated by drawing 100 years of changes in total factor productivity across multiple countries with replacement from yearly Penn World Table data between 1995 and 2019. The average pairwise correlation between the shocks is 25 percent.

others (2021) to an estimate closer to the long-term substitutability implied by Boehm, Levchenko, and Pandalai-Nayar (2020).[22]

Diversification and Substitutability Can Boost Resilience to Cross-Border Supply Shocks

Diversification substantially reduces the GDP losses in all regions of the world following a sizable (25 percent) labor supply contraction in a single large global supplier of intermediate inputs.[23] In this scenario, the average economy's GDP falls by 0.8 percent under the baseline level of diversification. In the high-diversification scenario, Figure 4.11 shows that the decline in GDP is reduced by almost half.[24] Most of this benefit accrues to countries other than the source country, as higher diversification makes them less dependent on intermediates produced by the source country. The source country also benefits, as diversification makes it less dependent on domestic sources.

Higher diversification also reduces the volatility of GDP growth when a series of shocks affect more than one country, with some correlation across countries. Figure 4.12 shows the results from simulations that draw multicountry shock scenarios from historical productivity data.[25] Diversification offers some protection against

[22]The elasticity of tariff-exclusive trade flows to tariff changes estimated by Boehm, Levchenko, and Pandalai-Nayar (2020) equals the elasticity of substitution in the Armington (1969)/Krugman (1980) setting. Boehm, Levchenko, and Pandalai-Nayar (2020) estimate that the long-term elasticity ranges from 1.75 to 2.25. The counterfactual analysis chooses a parameter value of 2.0 to discipline the upper bound of short-term elasticity. Online Annex 4.4 discusses the selection of the parameter value in detail.

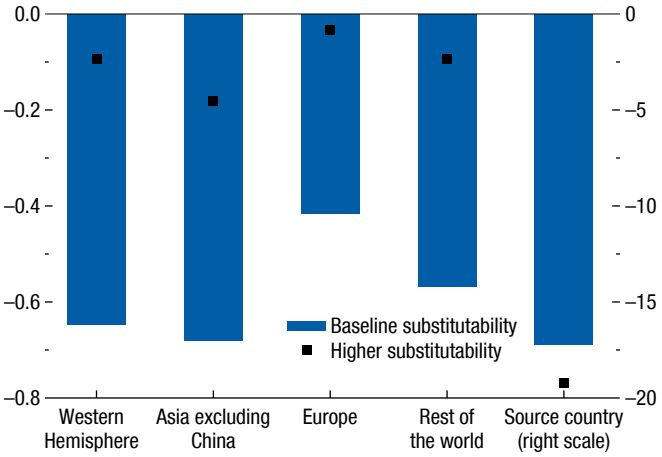
[23]The global supplier is calibrated to closely match China. The scenario assumes a drop of two standard deviations in China's total factor productivity, using Penn World Table data, which is equivalent to a labor supply contraction of about 22 percent (rounded up to 25 percent in the scenario), assuming Cobb-Douglas production with Organisation for Economic Co-operation and Development averages of labor supply elasticity and labor share of income (as explained in Online Annex 4.4).

[24]These are simple averages across countries. The GDP-weighted average across countries is a loss of 3.2 percent under baseline levels of diversification (with China contributing 2.7 percentage points of that loss) and 2.6 percent in the high-diversification world (with China contributing 2.4 percentage points).

[25]Specifically, 100 years of multicountry total factor productivity changes are sampled with replacement (bootstrapped) from yearly Penn World Table data between 1995 and 2019. These shocks should be seen as having a medium to high correlation with one another, because member countries of the Organisation for Economic Co-operation and Development make up a large portion of the sample. The average pairwise correlation between the shocks is 25 percent.

Figure 4.13. Gains from Substitutability Following a Supply Disruption in a Large Supplier Country
(Percent)

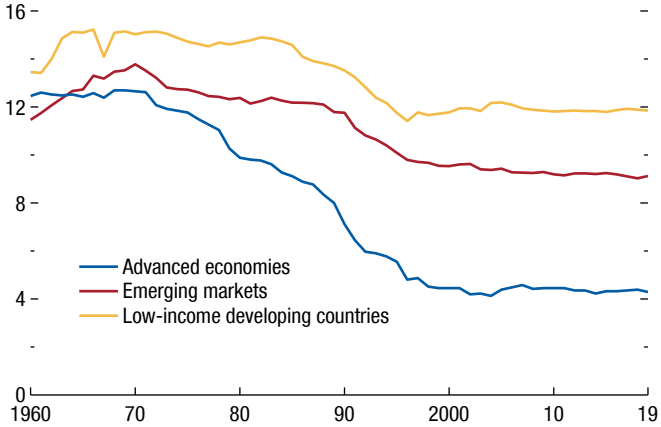
Greater substitutability reduces GDP losses by about four-fifths relative to the baseline in non–source countries.



Source: IMF staff calculations.
Note: The figure shows GDP declines in response to a 25 percent labor supply contraction in a country that is a large global supplier of intermediates. The bars and squares show simple averages of GDP declines across countries within each region. Baseline elasticity of substitution = 0.5. Higher elasticity of substitution = 2.0.

Figure 4.14. Nontariff Barriers Index
(Simple average)

There is room to lower nontariff barriers among emerging markets and low-income developing countries.



Source: Estefania-Flores and others (2022).

shocks with this level of correlation, reducing the volatility of GDP growth in the average country by 5 percent.[26]

By contrast, diversification offers little protection against exceptionally highly correlated shocks. For example, under the scenario calibrated to the first four months of the COVID-19 pandemic that Bonadio and others (2021) analyze, world GDP falls by the same amount under high diversification as it does under levels of diversification observed in the data.

Turning to substitutability, countries benefit from being able to more easily substitute away from one country's inputs to those produced in another country. Considering again the scenario of the 25 percent labor supply contraction in a large global supplier of intermediate inputs, the results show that with greater substitutability—even though it amplifies the shock in the source country—all countries other than the source country benefit, as their GDP losses are reduced by about four-fifths (Figure 4.13).[27]

In terms of achieving greater diversification, the model also shows that reducing trade costs can help. A one-quarter reduction in the costs of trading in intermediates lowers the Herfindahl index of geographic concentration in the sourcing of intermediates by 4 percentage points from 60 percent as observed in actual data.[28]

Conventional policy tools for reducing trade costs include tariff and nontariff barriers. With tariff barriers having declined globally to low levels, there is still ample scope to reduce nontariff barriers, particularly in emerging markets and low-income developing countries (Figure 4.14). Consistent with the model, other evidence from the literature suggests that such trade cost reductions could lead to sizable GDP gains (October 2021 *Regional Economic Outlook: Asia and Pacific*; Estefania-Flores and others 2022).

The model's results on the benefits of diversification and substitutability naturally raise the question of why profit-maximizing firms do not already take advantage of these opportunities. To some extent this could reflect government policies that favor domestic sourcing and thus tilt the scales against greater diversification (for example, Made in China 2025, the Make in India initiative, and the United States Innovation and Competition Act of 2021).[29] But it is also important

[26]Online Annex 4.4 shows that the results on diversification and volatility are symmetric, in that lower diversification would increase volatility.

[27]For modeling purposes, the characteristics of the large global supplier are calibrated to those of China. However, the conclusions are robust to using other countries for calibration.

[28]The increase in diversification is similar across regions.

[29]See McBride and Chatzky (2019) for China, Press Information Bureau (2017) for India, and Hufbauer and Jung (2021) for the United States.

to emphasize that the model does not capture all the factors feeding into firm-level decisions. There are likely to be costly trade-offs for firms in building resilience, including the costs of holding larger inventories, fixed costs of establishing new supply relationships, and efficiency gains from dealing with a smaller number of suppliers—which, if large, could reduce gains from diversification. That said, the trade-off between efficiency and lower risk may not be acute, given that firms that are best at mitigating risks also tend to be the most efficient.[30]

To summarize, the evidence from a modeling approach suggests that resilience to cross-border supply shocks can be increased with greater input source diversification (using more foreign inputs) and greater input substitutability (across suppliers), although the benefits are smaller if shocks are more widespread and correlated across countries. From a policy perspective, these findings on gains from diversification and substitutability suggest the need to provide a supportive environment for firm-level measures to enhance GVC resilience.

Policy Implications

The role of factors specific to the pandemic in shaping trade patterns suggests that the pandemic-induced rotation in demand from services to goods may not be lasting. In particular, services trade should recover as travel restrictions are lifted. The pace of the recovery is therefore likely to be closely related to the success of global public health efforts, and a quicker-than-expected easing of mobility restrictions could pose an upside risk to global trade projections.[31] Facilitating the full return of mobility should therefore be an important element in boosting services demand back to pre-pandemic trends. That said, it is possible that some changes in services trade may be more persistent. For instance, increasing familiarity with virtual interactions may reduce certain kinds of travel more permanently (Antràs 2021).

The evidence on international spillovers presented in this chapter further underscores the urgency of dealing with the pandemic everywhere. Vaccinating widely across countries is important not just from the perspective of domestic economic activity, but also to minimize supply disruption spillovers onto partner countries. Moreover, strengthening health systems and investing in digital infrastructure would help mitigate the transmission of shocks in future shock scenarios, including further COVID-19 variants or other possible pandemics.

The chapter emphasizes that overall, trade was fairly resilient in the pandemic—falling sharply initially, but then recovering rapidly in line with economic activity and demand, despite significant bottlenecks in trade logistics. Trade was also resilient in key GVC-intensive industries—with the notable exception of the automotive sector. Policy proposals to reduce dependence on foreign suppliers, especially in strategic sectors, have gained prominence (Javorcik 2020), including in major markets such as Europe and the United States (Le Maire 2020; White House 2021). The resilience of trade through the pandemic suggests that such proposals may be premature, if not misguided (Baldwin and Freeman 2021; Antràs 2021; OECD 2021; Miroudot 2020; Eppinger and others 2021).

This chapter argues instead that greater diversification in international sourcing of inputs and greater substitutability in input sourcing could enhance GVC resilience. The lessons from Toyota's adaptations following the Tohoku earthquake are instructive (APEC 2021). Toyota took measures to increase diversification and substitutability, much in line with the model-based evidence presented by this chapter. In particular the company (1) standardized some components across vehicle models to enable global sharing of inventory and flexibility in production across various sites, (2) built a comprehensive database of its suppliers and parts held in inventory, (3) regionalized its supply chains to avoid depending on a single location, and (4) asked its single-source suppliers to disperse production of parts to multiple locations or hold extra inventory. Firms may also choose to adopt greater mechanization as a way to gain resilience against shocks to labor supply (Box 4.3).

The lessons from this chapter suggest the following policy recommendations.

- **Enhancing Infrastructure.** While firm-level decisions will predominantly shape the future resilience of GVCs, government policies can help by providing a supportive environment and lowering the costs of greater diversification and substitutability.

[30]For example, firms with just-in-time inventory management also enjoy lower inventory costs and would be best placed to increase inventories if needed, while remaining competitive (Miroudot 2020; van Stekelenborg 2020).

[31]Separately, advances in digital technology could provide a further boost to trade in services, for example, in areas such as health and education (Baldwin and Freeman 2021).

One obvious area is infrastructure. The pandemic has shown that infrastructure investments in certain areas are critical for mitigating supply disruptions related to trade logistics. For example, upgrading and modernizing port infrastructure on key global shipping routes would help reduce global choke points.

- **Closing Information Gaps.** Governments could also step in to resolve informational externalities, which could help firms to make more strategic decisions. For example, evidence suggests that automobile manufacturers on average have about 250 Tier 1 suppliers (with which the manufacturers conduct business directly), but this number rises to 18,000 suppliers in the full value chain (Baumgartner, Malik, and Padhi 2020).[32] It is easy to see how visibility over the supply chain would be challenging for firms that lack the resources of large corporate entities. Filling informational gaps could thus be a key role that governments can play. Advancing digitalization of firms' document filings, such as tax returns, can help generate more information on interfirm transactions and supply chain networks.[33] This information could be useful in stress-testing exercises to identify supply chain weaknesses and risks.
- **Reducing Trade Costs.** Finally, reducing trade costs can help boost diversification in inputs. Considerable scope exists to reduce nontariff barriers in particular, which would carry substantial medium-term growth benefits, especially in emerging markets and low-income developing countries (October 2021 *Regional Economic Outlook: Asia and Pacific*). In addition, reducing trade policy uncertainty and providing an open and stable, rules-based trade policy regime can also support greater diversification (Handley and others 2020; OECD 2021).

[32]Tier 1 suppliers provide parts or systems directly to an "original equipment manufacturer" or enterprise (such as Chevrolet). Tier 2 suppliers in turn supply inputs to Tier 1 suppliers.

[33]For example, Gadenne, Nandi, and Rathelot (2019) use value-added tax (VAT) data from the state of West Bengal (India) to map supply chains. VAT-paying firms are required to report transactions with other tax-registered firms, providing matches between client and supplier tax identifiers. Similarly, Alfaro-Ureña, Manelici, and Vasquez (2020) use tax identification data in firms' tax declarations in Costa Rica to match buyer firms with supplier firms.

Box 4.1. Effects of Global Supply Disruptions during the Pandemic

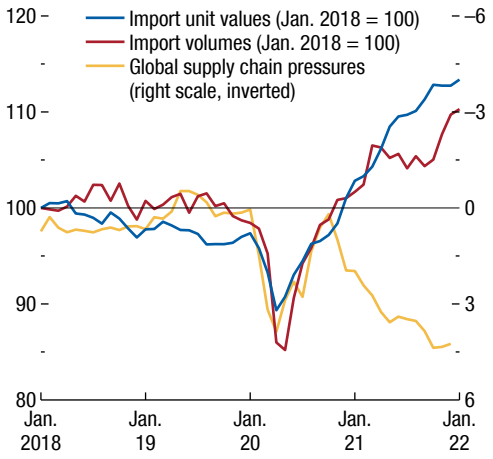
Supply chain pressures increased to unprecedented levels at the onset of the COVID-19 pandemic, and after a significant easing in the second half of 2020, accelerated again to reach a new peak by the end of 2021. Shipping costs steadily increased until September 2021, when they started a moderate decline. Delivery times lengthened in 2021, and indices of future delivery times indicate that supply chain disruptions persist. Trade flows closely mimicked the evolution of supply chain disruptions in the first phase of the crisis. Although the recovery in trade continued even when supply chain pressures resumed in late 2020 (Figure 4.1.1), flat import volumes and rising unit values in 2021 suggest that supply disruptions have contributed to inflationary pressures (Helper and Soltas 2021; Leibovici and Dunn 2021).

Supply chain disruptions have large real effects on firm inventories, production, and sales (Bonadio and others 2021; Carvalho and others 2021). These effects were still in evidence in the first weeks of 2022. High-frequency data from the United States show that the share of firms that reported foreign supplier delays increased from 9 percent in October 2020 to 20 percent in December 2021. A growing share of small businesses have also reported difficulties in locating alternative foreign suppliers. These developments are particularly severe in the manufacturing, construction, and trade sectors and have translated into an increase in the share of firms reporting delays in production and delivery to their customers, which reached 14 percent and 26 percent, respectively, in December 2021 (Figure 4.1.2). These persistent pressures, which increased in January 2022 as the Omicron wave spread in the United States, indicate a need to discuss policy options to improve global value chains' risk management through more flexibility, better knowledge and information, and better adaptability to shocks.

Disruptions in some industries have been particularly conspicuous. The automotive industry is a case in point. Trade in (and sales of) automobiles collapsed during spring 2020 and then started rebounding in the second half of the year, although without reaching pre-pandemic levels. The shortage of automotive chips was a key factor behind this drop. At the beginning of the pandemic, the shift to remote working led to a sharp increase in demand for semiconductors. By contrast, the demand for cars fell, and pessimism

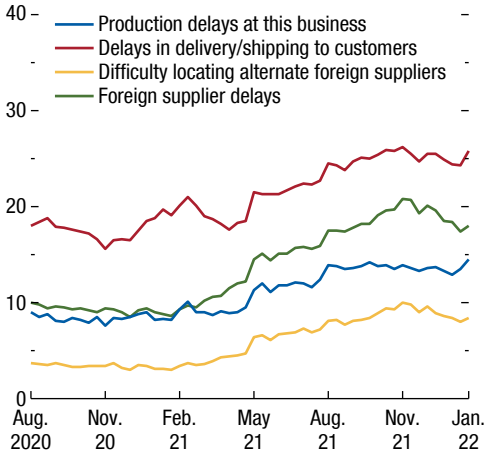
This box was prepared by the Chapter 4 authoring team.

Figure 4.1.1. Global Goods Trade and Supply Chain Pressures
(Index)



Sources: Benigno and others (2022); CPB World Trade Monitor; and IMF staff calculations.
Note: The index of global supply chain pressures is a composite measure of several variables combining cross-border transportation costs with country-level supply chain measures of delays, backlogs, and inventories from manufacturing surveys.

Figure 4.1.2. Foreign Suppliers, Production, and Delivery Delays in the United States
(Percent)

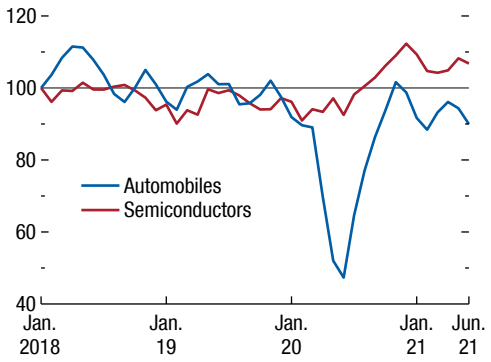


Sources: US Census Bureau, Small Business Pulse Survey; and IMF staff calculations.
Note: Data are as of January 20, 2022.

Box 4.1 *(continued)*

about the economy led car producers to limit their orders for semiconductors. When pent-up demand for cars accelerated more than expected in the second half of 2020, the semiconductor industry had limited production capacity to meet the demand for automotive chips because it had already shifted production to meet demand from other sectors (such as consumer electronics) (Deloitte 2021). Trade tensions and domestic shocks (such as a drought in Taiwan Province of China) aggravated this shortage, which has constrained recovery in the automotive sector, despite strong demand (Figure 4.1.3), and has resulted in higher prices. More generally, the shortage of semiconductors, a key component for many products, has highlighted the vulnerabilities of global value chains and driven calls for reshoring and for increasing supply chain resilience.

Figure 4.1.3. Trade in Automobiles and Semiconductors
(Index, January 2018 = 100)



Sources: Trade Data Monitor; and IMF staff calculations.
Note: "Automobiles" comprises Harmonized System six-digit codes for manufactured intermediate inputs and final goods (vehicles). "Semiconductors" comprises Harmonized System six-digit codes 854150 and 854190.

Box 4.2. The Impact of Lockdowns on Trade: Evidence from Shipping Data

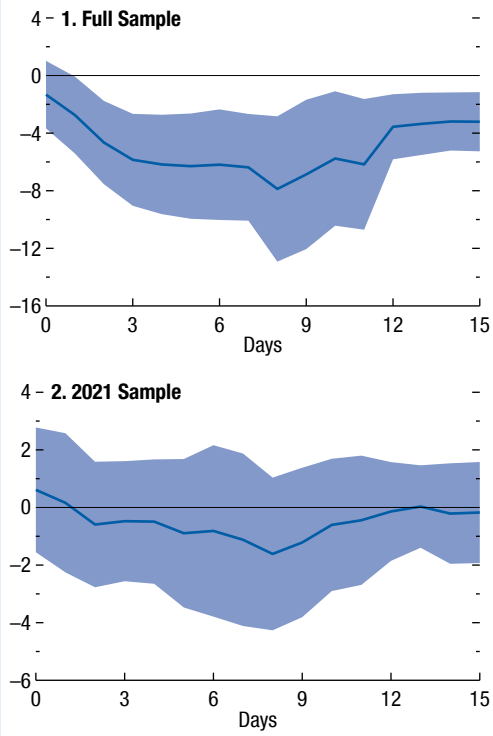
This box examines the effect on trade of pandemic containment measures, using a unique data set of daily bilateral seaborne trade volumes (see Cerdeiro and others 2020). A country's imports during a pandemic are affected by lockdowns imposed by trade partners (suppliers). Domestic factors (health situation, macroeconomic policies, consumer sentiment) are also likely to influence bilateral trade. The following import equation is estimated at a *daily* frequency to measure the effect of a lockdown imposed by country j on the growth of country i's imports from country j (bilateral import growth) at horizon h, $\widehat{M}_{ij,t+h}$:

$$\widehat{M}_{ij,t+h} = \gamma_{it} + \alpha_{ij} + \beta LS_{jt} + \mathbf{X}'_{jt}\delta + \sum_{k=1}^{7} \widehat{M}_{ij,t-k} + \varepsilon_{ij,t+h},$$

in which bilateral import growth from j to i ($\widehat{M}_{ijt}$) is the seven-day moving average of year-over-year growth rates with respect to pre-pandemic (2017–19) averages and LS_{jt} denotes the lockdown stringency (0–100) of the exporter country (Hale and others 2020).[1] The specification includes importer-time fixed effects, γ_{it}, to control for any unobserved time-varying factors affecting country i's imports; a bilateral pair fixed effect α_{ij}; and a vector of control variables $\mathbf{X}'_{jt}$ (the ratio of new COVID-19 cases to the population and an aggregate measure of exporters' exposure to foreign lockdowns).[2]

Over the full 2020–21 sample, exporter lockdowns have a large and statistically significant impact on bilateral trade volumes (Figure 4.2.1, panel 1). As the stringency variable has a range of 0–100, the point estimates of around 5 imply that less than a full lockdown (a change in stringency of just 20 points) can temporarily halt bilateral trade. Notably, lockdowns have no statistically significant effect on trade volumes in 2021 (Figure 4.2.1, panel 2). This finding is consistent with activity becoming less susceptible to lockdowns as economies adapt to the pandemic and underscores the resilience of global value chains.

Figure 4.2.1. Response of Bilateral Import Growth to Exporter Lockdowns
(Percent)



Source: IMF staff estimates based on Cerdeiro and others (2020). Automatic Identification System data were collected by Marine Traffic.
Note: The shaded areas indicate 95 percent confidence bands; robust standard errors.

The authors of this box are Andras Komaromi, Diego Cerdeiro, and Yang Liu.

[1]Lockdown measures are lagged to account for delivery lags in shipping. For example, if all voyages from country j to country i take three days, then lockdown stringency measures in j are lagged by three days in the equation for imports into i.

[2]This empirical specification captures lockdown-induced trade disruptions at the bilateral level, but it does not rule out cases in which a drop in bilateral imports is made up for by sourcing goods from a different country. For an alternative approach that takes into account potential substitution effects and measures lockdown disruptions in terms of aggregate imports, see Cerdeiro and Komaromi (2020). The bilateral specification presented here has the important advantage that one can control for any time-varying confounding factors specific to the importer.

Box 4.3. Firm-Level Trade Adjustment to the COVID-19 Pandemic in France

This box uses monthly French Customs data on firms' imports and exports for 2019 and 2020 to examine the duration of, and margins of adjustment to, the shock induced by the COVID-19 pandemic. Adjustment occurred mainly along the intensive margin (volumes). The extensive margin, with varieties dropping out of France's trade basket, contributed marginally to the total trade adjustment, indicating the temporary nature of the shock (Antràs 2021).[1] The trade recovery was supported by the rebound in consumer demand and extensive economic relief policies implemented by the French government.

- *The trade of downstream firms was more affected.* The average impact of importing-country lockdowns on exports of firms selling final consumer goods (downstream firms) was nearly nine times larger than that for firms selling intermediate inputs (upstream firms).[2]
- *Greater automation was associated with more resilience.* The impact of lockdowns and the spread of the virus (measured by COVID-19 deaths) on exports was almost 67 percent larger for firms that are less automated (Figure 4.3.1, panel 1).
- *Firms in low-inventory industries experienced larger contractions in trade.* Imports of firms in industries holding the lowest stocks of inventories fell more than twice as much as those among firms in industries with average inventory intensity (Figure 4.3.1, panel 2).[3] Firms in industries with the highest inventory intensity increased imports. Exporters in more inventory-intensive industries also experienced a smaller drop in sales (Figure 4.3.1, panel 1), suggesting that inventories play a shock-absorbing role.

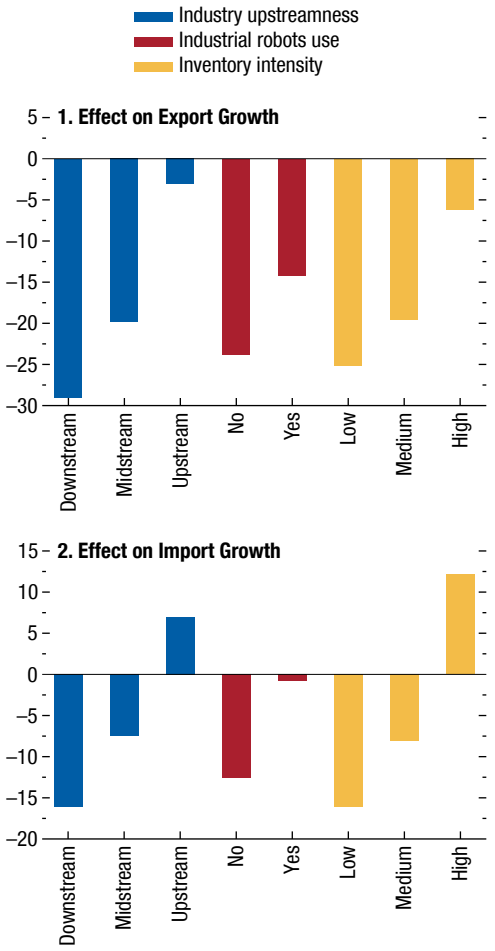
The authors of this box are Mariya Brussevich, Chris Papageorgiou, and Pauline Wibaux. For details on data and estimation methodology, see Brussevich, Papageorgiou, and Wibaux (forthcoming).

[1]A variety is defined as a trade-partner-specific product, following the eight-digit Combined Nomenclature classification.

[2]To evaluate the heterogeneous effects of lockdown stringency and deaths by industry or firm characteristics, stringency and deaths variables are interacted with one of the variables of interest: an industry-level measure of upstreamness (Antràs and others 2012), firm-level imports of industrial robots as a proxy for automation, and an industry-level measure of inventory intensity (ratio of inventory to sales).

[3]The results on inventory intensity are sensitive to the measure of industry-average inventory-to-sales ratios.

Figure 4.3.1. Impact of Supply Chain Upstreamness, Automation, and Inventories on Trade Adjustment
(Percent)



Sources: Antràs and others (2012); French Customs data; Hale and others (2021); and IMF staff calculations.
Note: Each bar corresponds to the average effect for a given group of firms derived from the regression of firms' exports and imports on COVID-19 lockdown intensity and COVID-19 deaths in trade partner countries interacted with the industry's upstreamness index, its median ratio of inventories to sales, and firms' use of industrial robots. Downstream industries are closest to the final consumer, whereas upstream and midstream industries specialize predominantly in production of intermediate inputs.

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STATISTICAL APPENDIX

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

The first section summarizes the assumptions underlying the estimates and projections for 2022–23. The second section briefly describes the changes to the database and statistical tables since the October 2021 *World Economic Outlook*. 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. The sixth 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 with the main WEO report; Statistical Appendix B is available in a separate online document at www.imf.org/en/Publications/WEO.)

Data in these tables have been compiled on the basis of information available through April 8, 2022. The figures for 2022–23 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 February 22, 2022–March 22, 2022. For 2022 and 2023 these assumptions imply average US dollar–special drawing right (SDR) conversion rates of 1.394 and 1.409, US dollar–euro conversion rates[1] of 1.114 and 1.130, and yen–US dollar conversion rates of 114.7 and 109.5, respectively.

It is assumed that the *price of oil* will average $106.83 a barrel in 2022 and $92.63 a barrel in 2023.

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 0.9 percent in 2022 and 2.4 percent in 2023, for the euro area will average –0.7 percent in 2022 and 0.0 percent in 2023, and for Japan will average 0.0 percent in 2022 and 0.1 percent in 2023. Further, it is assumed that the *10-year government bond yield* for the United States will average 2.6 percent in 2022 and 3.4 percent in 2023, for the euro area will average 0.4 percent in 2022 and 0.6 percent in 2023, and for Japan will average 0.3 percent in 2022 and 0.4 percent in 2023.

What's New

- For Ecuador, fiscal sector projections are excluded from publication for 2022–27 because of ongoing program review discussions.
- Ethiopia's forecast data, which were previously omitted due to an unusually high degree of uncertainty, are now included.
- Fiji's fiscal data and forecasts are now presented on a fiscal year basis.
- For Tunisia, projections are excluded from publication for 2023–27 because of ongoing technical discussions pending potential program negotiations.

[1] In 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 Box 5.4 of the October 1998 WEO 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 October 2020 WEO.

- For Ukraine, all projections for 2022–27 except Real GDP are omitted due to an unusually high degree of uncertainty. Real GDP is projected through 2022.
- Venezuela redenominated its currency on October 1, 2021, by replacing 1,000,000 bolívares soberanos (VES) with 1 bolívar digital (VED).
- Beginning with the April 2022 WEO, the interest rate assumptions are based on the three-month and 10-year government bond yields, which replace the London interbank offered rates. See the Assumptions section for more details.

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* (2008 SNA). 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* (MFSMCG), 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, 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 partly 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, 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 can sometimes be 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

[2] Many countries are implementing the SNA 2008 or European System of National and Regional Accounts (ESA) 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 each country adheres to.

[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.

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 after conversion to the international dollar in the years indicated.

Unless noted otherwise, composites for all sectors for the euro area are corrected for reporting discrepancies in intra-area transactions. 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.

[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.

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 each country.

For some countries, the figures for 2021 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 indicators for each country.

Country Notes

For *Afghanistan*, data and projections for 2021–27 are omitted because of an unusually high degree of uncertainty given that the IMF has paused its engagement with the country due to a lack of clarity within the international community regarding the recognition of a government in Afghanistan.

For *Argentina*, the official national consumer price index (CPI) for Argentina 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 on account of differences in geographical coverage, weights, sampling, and methodology, the average CPI inflation for 2014–16 and end-of-period inflation for 2015–16 are not reported in the WEO. Inflation projections reflect the upper bound of the program range given recent world commodity price developments. 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.

Data and forecasts for *Bangladesh* 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.

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

The fiscal series for the *Dominican Republic* have the following coverage: public debt, debt service, and the cyclically adjusted/structural balances are for the

consolidated public sector (which includes central government, the rest of the nonfinancial public sector, and the central bank); the remaining fiscal series are for the central government.

For *Ecuador*, fiscal sector projections are excluded from publication for 2022–27 because of ongoing program review discussions. The authorities are undertaking revisions of the historical fiscal data with technical support from the IMF.

India's 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.

For *Lebanon*, data and projections for 2021–27 are omitted due to an unusually high degree of uncertainty. At the time of preparation of the WEO database, official GDP numbers were available only through 2019.

Against the backdrop of a civil war and weak capacity, the reliability of *Libya*'s data, especially regarding national accounts and medium-term projections, is low.

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

For *Tunisia*, projections are excluded from publication for 2023–27 because of ongoing technical discussions pending potential program negotiations.

For *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 and projections of the fiscal balance exclude receipts from domestic bond issuances as well as privatization operations, in line with GFSM 2014. The authorities' official estimates on fiscal accounts, which are compiled using domestic statistical methodologies, include bond issuance and privatization proceeds as part of government revenues.

For *Ukraine,* all projections for 2022–27 except real GDP are omitted due to an unusually high degree of uncertainty. Real GDP is projected through 2022. Revised national accounts data are available beginning in 2000 and exclude Crimea and Sevastopol from 2010 onward.

In December 2020 the *Uruguay* authorities began reporting the national accounts data according to 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.

Starting in October 2018 *Uruguay*'s public pension system has been receiving transfers in the context of a new law 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 2018–21 are affected by these transfers, which amounted to 1.2 percent of GDP in 2018, 1.1 percent of GDP in 2019, and 0.6 percent of GDP in 2020, and are projected to be 0.3 percent of GDP in 2021, and zero 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 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 where 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.

Projecting the economic outlook in *Venezuela*, including assessing past and current economic developments as the basis for the projections, is complicated by the lack of discussions with the authorities (the last Article IV consultation took place in 2004), incomplete understanding of the reported data, and difficulties in interpreting certain reported economic indicators given economic developments. The fiscal accounts include the budgetary central government; social security; FOGADE (insurance deposit institution); and a sample of public enterprises, including Petróleos de Venezuela, S.A. (PDVSA); and data for 2018–21 are IMF staff estimates. The effects of hyperinflation and the paucity of reported data mean that the IMF staff's projected macroeconomic indicators need to be interpreted with caution. Public external debt in relation to GDP is projected using the IMF staff's estimate of the average exchange rate for the year. Wide 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).

In 2019 *Zimbabwe* authorities introduced the Real Time Gross Settlement dollar, later renamed the Zimbabwe dollar, and are in the process of redenominating their national accounts statistics. Current data are subject to revision. 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 it 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 40 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 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 (156) includes 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 2016 and 2020.

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 2020 were negative. Net debtor economies are further differentiated on the basis of *experience with debt servicing*.[7]

The HIPC group comprises the countries that are or have been considered by the IMF and the

[6] As 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.

[7] During 2016–20, 35 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 2016–20*.

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 benefited from debt relief and have graduated from the initiative.

[8] See 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).

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, 2021[1]

(Percent of total for group or world)

		GDP		Exports of Goods and Services		Population	
	Number of Economies	Advanced Economies	World	Advanced Economies	World	Advanced Economies	World
Advanced Economies	**40**	**100.0**	**42.1**	**100.0**	**61.4**	**100.0**	**14.0**
United States		37.4	15.7	14.9	9.1	30.8	4.3
Euro Area	19	28.5	12.0	42.4	26.0	31.6	4.4
Germany		7.9	3.3	11.8	7.2	7.7	1.1
France		5.5	2.3	5.4	3.3	6.1	0.9
Italy		4.4	1.9	4.0	2.5	5.5	0.8
Spain		3.2	1.4	2.9	1.8	4.4	0.6
Japan		9.1	3.8	5.4	3.3	11.6	1.6
United Kingdom		5.5	2.3	5.1	3.1	6.3	0.9
Canada		3.3	1.4	3.6	2.2	3.5	0.5
Other Advanced Economies	17	16.2	6.8	28.8	17.7	16.1	2.3
Memorandum							
Major Advanced Economies	7	73.2	30.8	50.1	30.8	71.6	10.0
		Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World
Emerging Market and Developing Economies	**156**	**100.0**	**57.9**	**100.0**	**38.6**	**100.0**	**86.0**
Regional Groups							
Emerging and Developing Asia	30	56.0	32.4	52.3	20.2	55.9	48.1
China		32.1	18.6	33.2	12.8	21.4	18.4
India		12.1	7.0	6.3	2.4	21.0	18.1
ASEAN-5	5	9.5	5.5	11.5	4.4	8.8	7.6
Emerging and Developing Europe	16	13.4	7.8	16.6	6.4	5.7	4.9
Russia		5.3	3.1	5.1	2.0	2.2	1.9
Latin America and the Caribbean	33	12.6	7.3	12.8	4.9	9.7	8.3
Brazil		4.1	2.4	3.0	1.1	3.2	2.8
Mexico		3.1	1.8	4.9	1.9	1.9	1.7
Middle East and Central Asia	32	12.6	7.3	14.2	5.5	12.4	10.7
Saudi Arabia		2.1	1.2	2.7	1.0	0.5	0.5
Sub-Saharan Africa	45	5.4	3.1	4.1	1.6	16.2	14.0
Nigeria		1.4	0.8	0.5	0.2	3.2	2.7
South Africa		1.0	0.6	1.2	0.5	0.9	0.8
Analytical Groups[2]							
By Source of Export Earnings							
Fuel	26	10.0	5.8	13.7	5.3	9.6	8.2
Nonfuel	128	89.9	52.1	86.2	33.3	90.3	77.7
Of Which, Primary Products	37	5.6	3.3	5.5	2.1	9.4	8.0
By External Financing Source							
Net Debtor Economies	121	49.7	28.8	42.7	16.5	67.9	58.4
Of Which, Economies with Arrears and/or Rescheduling during 2016–20	35	4.4	2.6	2.9	1.1	10.5	9.0
Other Groups							
Emerging Market and Middle-Income Economies	96	91.9	53.2	93.1	35.9	76.8	66.1
Low-Income Developing Countries	59	8.1	4.7	6.9	2.7	23.2	19.9
Heavily Indebted Poor Countries	39	2.8	1.6	2.0	0.8	11.8	10.2

[1]The 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.

[2]Syria 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.

Table B. Advanced Economies by Subgroup

Major Currency Areas		
United States		
Euro Area		
Japan		
Euro Area		
Austria	Greece	The Netherlands
Belgium	Ireland	Portugal
Cyprus	Italy	Slovak Republic
Estonia	Latvia	Slovenia
Finland	Lithuania	Spain
France	Luxembourg	
Germany	Malta	
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	

[1]On July 1, 1997, Hong Kong was returned to the People's Republic of China and became a Special Administrative Region of China.
[2]On 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 Earnings[1]

	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
	Trinidad and Tobago	Bolivia
	Venezuela	Chile
		Guyana
		Paraguay
		Peru
		Suriname
		Uruguay
Middle East and Central Asia		
	Algeria	Afghanistan
	Azerbaijan	Mauritania
	Bahrain	Somalia
	Iran	Sudan
	Iraq	Tajikistan
	Kazakhstan	Uzbekistan
	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	Côte d'Ivoire
		Eritrea
		Ghana
		Guinea
		Guinea-Bissau
		Liberia
		Malawi
		Mali
		Sierra Leone
		South Africa
		Zambia
		Zimbabwe

[1]Emerging 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]
Emerging and Developing Asia			
Bangladesh	*		*
Bhutan	*		*
Brunei Darussalam	•		•
Cambodia	*		*
China	•		•
Fiji	*		•
India	*		•
Indonesia	*		•
Kiribati	•		*
Lao P.D.R.	*		*
Malaysia	*		•
Maldives	*		•
Marshall Islands	*		•
Micronesia	•		•
Mongolia	*		•
Myanmar	*		*
Nauru	*		•
Nepal	•		*
Palau	*		•
Papua New Guinea	*		*
Philippines	*		•
Samoa	*		•
Solomon Islands	*		*
Sri Lanka	*		•
Thailand	•		•
Timor-Leste	•		*
Tonga	*		•
Tuvalu	•		•
Vanuatu	•		•
Vietnam	*		*
Emerging and Developing Europe			
Albania	*		•
Belarus	*		•
Bosnia and Herzegovina	*		•
Bulgaria	*		•
Croatia	*		•
Hungary	*		•
Kosovo	*		•
Moldova	*		*
Montenegro	*		•
North Macedonia	*		•
Poland	*		•
Romania	*		•
Russia	•		•
Serbia	*		•
Turkey	*		•
Ukraine	*		•
Latin America and the Caribbean			
Antigua and Barbuda	*		•
Argentina	•		•
Aruba	*		•
The Bahamas	*		•
Barbados	*		•
Belize	*		•
Bolivia	*	•	•
Brazil	*		•
Chile	*		•
Colombia	*		•
Costa Rica	*		•
Dominica	•		•
Dominican Republic	*		•
Ecuador	*		•
El Salvador	*		•
Grenada	*		•
Guatemala	*		•
Guyana	*	•	•
Haiti	*	•	*
Honduras	*	•	*
Jamaica	*		•
Mexico	*		•
Nicaragua	*	•	*
Panama	*		•
Paraguay	*		•
Peru	*		•
St. Kitts and Nevis	*		•
St. Lucia	*		•
St. Vincent and the Grenadines	*		•
Suriname	*		•
Trinidad and Tobago	•		•
Uruguay	*		•
Venezuela	•		•

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]
Middle East and Central Asia			
Afghanistan	•	•	*
Algeria	•		•
Armenia	*		•
Azerbaijan	•		•
Bahrain	•		•
Djibouti	*		*
Egypt	*		•
Georgia	*		•
Iran	•		•
Iraq	•		•
Jordan	*		•
Kazakhstan	*		•
Kuwait	•		•
Kyrgyz Republic	*		*
Lebanon	*		•
Libya	•		•
Mauritania	*	•	*
Morocco	*		•
Oman	*		•
Pakistan	*		•
Qatar	•		•
Saudi Arabia	•		•
Somalia	*	*	*
Sudan	*	*	*
Syria[4]	. . .		. . .
Tajikistan	*		*
Tunisia	*		•
Turkmenistan	•		•
United Arab Emirates	•		•
Uzbekistan	•		*
West Bank and Gaza	*		•
Yemen	*		*
Sub-Saharan Africa			
Angola	*		•
Benin	*	•	*
Botswana	•		•
Burkina Faso	*	•	*
Burundi	*	•	*
Cabo Verde	*		•
Cameroon	*	•	*
Central African Republic	*	•	*
Chad	*	•	*
Comoros	*	•	*
Democratic Republic of the Congo	*	•	*
Republic of Congo	*	•	*
Côte d'Ivoire	*	•	*
Equatorial Guinea	•		•
Eritrea	•	*	*
Eswatini	•		•
Ethiopia	*	•	*
Gabon	•		•
The Gambia	*	•	*
Ghana	*	•	*
Guinea	*	•	*
Guinea-Bissau	*	•	*
Kenya	*		*
Lesotho	*		*
Liberia	*	•	*
Madagascar	*	•	*
Malawi	*	•	*
Mali	*	•	*
Mauritius	•		•
Mozambique	*	•	*
Namibia	*		•
Niger	*	•	*
Nigeria	*		*
Rwanda	*	•	*
São Tomé and Príncipe	*	•	*
Senegal	*	•	*
Seychelles	*		•
Sierra Leone	*	•	*
South Africa	•		•
South Sudan	*		*
Tanzania	*	•	*
Togo	*	•	*
Uganda	*	•	*
Zambia	*	•	*
Zimbabwe	*		*

[1]Dot (star) indicates that the country is a net creditor (net debtor).
[2]Dot 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.
[3]Dot (star) indicates that the country is classified as an Emerging Market and Middle-Income Economy (Low-Income Developing Country).
[4]Syria 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 Periods[1]

	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

[1]Unless noted otherwise, all data refer to calendar years.

Table G. Key Data Documentation

		National Accounts					Prices (CPI)	
Country	Currency	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	2020	2016	SNA 2008		NSO	2020
Albania	Albanian lek	IMF staff	2020	1996	ESA 2010	From 1996	NSO	2020
Algeria	Algerian dinar	NSO	2020	2001	SNA 1993	From 2005	NSO	2020
Andorra	Euro	NSO	2021	2010	. . .		NSO	2021
Angola	Angolan kwanza	NSO and MEP	2020	2002	ESA 1995		NSO	2020
Antigua and Barbuda	Eastern Caribbean dollar	CB	2019	2006[6]	SNA 1993		NSO	2021
Argentina	Argentine peso	NSO	2020	2004	SNA 2008		NSO	2021
Armenia	Armenian dram	NSO	2021	2005	SNA 2008		NSO	2021
Aruba	Aruban florin	NSO	2020	2013	SNA 1993	From 2000	NSO	2020
Australia	Australian dollar	NSO	2021	2020	SNA 2008	From 1980	NSO	2021
Austria	Euro	NSO	2021	2015	ESA 2010	From 1995	NSO	2021
Azerbaijan	Azerbaijan manat	NSO	2021	2005	SNA 1993	From 1994	NSO	2021
The Bahamas	Bahamian dollar	NSO	2020	2012	SNA 1993		NSO	2020
Bahrain	Bahrain dinar	NSO and IMF staff	2020	2010	SNA 2008		NSO	2021
Bangladesh	Bangladesh taka	NSO	2019/20	2005/06	SNA 2008		NSO	2020/21
Barbados	Barbados dollar	NSO and CB	2019	2010	SNA 1993		NSO	2020
Belarus	Belarusian ruble	NSO	2020	2018	SNA 2008	From 2005	NSO	2021
Belgium	Euro	CB	2020	2015	ESA 2010	From 1995	CB	2021
Belize	Belize dollar	NSO	2020	2000	SNA 1993		NSO	2021
Benin	CFA franc	NSO	2020	2015	SNA 2008		NSO	2020
Bhutan	Bhutanese ngultrum	NSO	2020/21	1999/2000[6]	SNA 2008		NSO	2020/21
Bolivia	Bolivian boliviano	NSO	2020	1990	SNA 2008		NSO	2020
Bosnia and Herzegovina	Bosnian convertible marka	NSO	2020	2015	ESA 2010	From 2000	NSO	2020
Botswana	Botswana pula	NSO	2020	2016	SNA 2008		NSO	2020
Brazil	Brazilian real	NSO	2020	1995	SNA 2008		NSO	2021
Brunei Darussalam	Brunei dollar	MoF	2020	2010	SNA 2008		MoF	2020
Bulgaria	Bulgarian lev	NSO	2021	2015	ESA 2010	From 1996	NSO	2021
Burkina Faso	CFA franc	NSO and MEP	2020	2015	SNA 2008		NSO	2020
Burundi	Burundi franc	NSO and IMF staff	2019	2005	SNA 1993		NSO	2020
Cabo Verde	Cabo Verdean escudo	NSO	2020	2007	SNA 2008	From 2011	NSO	2020
Cambodia	Cambodian riel	NSO	2020	2000	SNA 1993		NSO	2020
Cameroon	CFA franc	NSO	2020	2016	SNA 2008	From 2016	NSO	2020
Canada	Canadian dollar	NSO	2021	2012	SNA 2008	From 1980	MoF and NSO	2021
Central African Republic	CFA franc	NSO	2017	2005	SNA 1993		NSO	2020
Chad	CFA franc	CB	2017	2005	SNA 1993		NSO	2021
Chile	Chilean peso	CB	2021	2018[6]	SNA 2008	From 2003	NSO	2021
China	Chinese yuan	NSO	2021	2015	SNA 2008		NSO	2021
Colombia	Colombian peso	NSO	2021	2015	SNA 2008	From 2005	NSO	2021
Comoros	Comorian franc	MoF	2019	2007	SNA 1993	From 2007	NSO	2021
Democratic Republic of the Congo	Congolese franc	NSO	2020	2005	SNA 1993		CB	2020
Republic of Congo	CFA franc	NSO	2019	2005	SNA 1993		NSO	2021
Costa Rica	Costa Rican colón	CB	2021	2017	SNA 2008		CB	2021

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	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	2020	2001	CG	C	NSO, MoF, and CB	2020	BPM 6
Albania	IMF staff	2020	1986	CG,LG,SS,MPC, NFPC	. . .	CB	2020	BPM 6
Algeria	MoF	2020	1986	CG	C	CB	2020	BPM 6
Andorra	NSO and MoF	2020	. . .	CG,LG,SS	C	NSO	2020	BPM 6
Angola	MoF	2020	2001	CG,LG	. . .	CB	2020	BPM 6
Antigua and Barbuda	MoF	2020	2001	CG	Mixed	CB	2020	BPM 6
Argentina	MEP	2021	1986	CG,SG,SS	C	NSO	2020	BPM 6
Armenia	MoF	2020	2001	CG	C	CB	2020	BPM 6
Aruba	MoF	2020	2001	CG	Mixed	CB	2020	BPM 6
Australia	MoF	2020	2014	CG,SG,LG,TG	A	NSO	2021	BPM 6
Austria	NSO	2020	2014	CG,SG,LG,SS	A	CB	2020	BPM 6
Azerbaijan	MoF	2021	2001	CG	C	CB	2021	BPM 6
The Bahamas	MoF	2020/21	2014	CG	C	CB	2020	BPM 6
Bahrain	MoF	2020	2001	CG	C	CB	2021	BPM 6
Bangladesh	MoF	2018/19	. . .	CG	C	CB	2019/20	BPM 6
Barbados	MoF	2019/20	1986	BCG	C	CB	2019	BPM 6
Belarus	MoF	2020	2001	CG,LG,SS	C	CB	2020	BPM 6
Belgium	CB	2020	ESA 2010	CG,SG,LG,SS	A	CB	2020	BPM 6
Belize	MoF	2020	1986	CG,MPC	Mixed	CB	2020	BPM 6
Benin	MoF	2021	1986	CG	C	CB	2020	BPM 6
Bhutan	MoF	2020/21	1986	CG	C	CB	2020/21	BPM 6
Bolivia	MoF	2020	2001	CG,LG,SS,NMPC, NFPC	C	CB	2020	BPM 6
Bosnia and Herzegovina	MoF	2020	2014	CG,SG,LG,SS	Mixed	CB	2020	BPM 6
Botswana	MoF	2020/21	1986	CG	C	CB	2020	BPM 6
Brazil	MoF	2020	2001	CG,SG,LG,SS, NFPC	C	CB	2021	BPM 6
Brunei Darussalam	MoF	2020	1986	CG,BCG	C	NSO and MEP	2020	BPM 6
Bulgaria	MoF	2021	2001	CG,LG,SS	C	CB	2021	BPM 6
Burkina Faso	MoF	2020	2001	CG	CB	CB	2020	BPM 6
Burundi	MoF	2020	2001	CG	Mixed	CB	2020	BPM 6
Cabo Verde	MoF	2020	2001	CG	A	NSO	2020	BPM 6
Cambodia	MoF	2019	2001	CG,LG	Mixed	CB	2020	BPM 5
Cameroon	MoF	2020	2001	CG,NFPC,NMPC	Mixed	MoF	2020	BPM 5
Canada	MoF and NSO	2021	2001	CG,SG,LG,SS,other	A	NSO	2021	BPM 6
Central African Republic	MoF	2020	2001	CG	C	CB	2017	BPM 5
Chad	MoF	2020	1986	CG,NFPC	C	CB	2013	BPM 5
Chile	MoF	2021	2001	CG,LG	A	CB	2021	BPM 6
China	MoF	2020	. . .	CG,LG,SS	C	GAD	2021	BPM 6
Colombia	MoF	2020	2001	CG,SG,LG,SS	. . .	CB and NSO	2021	BPM 6
Comoros	MoF	2020	1986	CG	Mixed	CB and IMF staff	2019	BPM 5
Democratic Republic of the Congo	MoF	2020	2001	CG,LG	A	CB	2020	BPM 6
Republic of Congo	MoF	2020	2001	CG	A	CB	2018	BPM 6
Costa Rica	MoF and CB	2021	1986	CG	C	CB	2021	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	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	2019	2015	SNA 2008		NSO	2021
Croatia	Croatian kuna	NSO	2020	2015	ESA 2010		NSO	2020
Cyprus	Euro	NSO	2021	2010	ESA 2010	From 1995	NSO	2021
Czech Republic	Czech koruna	NSO	2020	2015	ESA 2010	From 1995	NSO	2021
Denmark	Danish krone	NSO	2021	2010	ESA 2010	From 1980	NSO	2021
Djibouti	Djibouti franc	NSO	2018	2013	SNA 2008		NSO	2021
Dominica	Eastern Caribbean dollar	NSO	2018	2006	SNA 1993		NSO	2020
Dominican Republic	Dominican peso	CB	2021	2007	SNA 2008	From 2007	CB	2020
Ecuador	US dollar	CB	2021	2007	SNA 2008		NSO and CB	2021
Egypt	Egyptian pound	MEP	2020/21	2016/17	SNA 2008		NSO	2020/21
El Salvador	US dollar	CB	2020	2014	SNA 2008		NSO	2021
Equatorial Guinea	CFA franc	MEP and CB	2020	2006	SNA 1993		MEP	2021
Eritrea	Eritrean nakfa	IMF staff	2018	2011	SNA 1993		NSO	2018
Estonia	Euro	NSO	2021	2015	ESA 2010	From 2010	NSO	2021
Eswatini	Swazi lilangeni	NSO	2020	2011	SNA 2008		NSO	2021
Ethiopia	Ethiopian birr	NSO	2020/21	2020/21	SNA 2008		NSO	2021
Fiji	Fijian dollar	NSO	2020	2014	SNA 2008		NSO	2020
Finland	Euro	NSO	2020	2015	ESA 2010	From 1980	NSO	2020
France	Euro	NSO	2021	2014	ESA 2010	From 1980	NSO	2021
Gabon	CFA franc	MoF	2020	2001	SNA 1993		NSO	2020
The Gambia	Gambian dalasi	NSO	2020	2013	SNA 2008		NSO	2020
Georgia	Georgian lari	NSO	2021	2015	SNA 2008	From 1996	NSO	2021
Germany	Euro	NSO	2021	2015	ESA 2010	From 1991	NSO	2021
Ghana	Ghanaian cedi	NSO	2019	2013	SNA 2008		NSO	2019
Greece	Euro	NSO	2021	2015	ESA 2010	From 1995	NSO	2021
Grenada	Eastern Caribbean dollar	NSO	2020	2006	SNA 1993		NSO	2020
Guatemala	Guatemalan quetzal	CB	2021	2013	SNA 2008	From 2001	NSO	2021
Guinea	Guinean franc	NSO	2019	2010	SNA 1993		NSO	2021
Guinea-Bissau	CFA franc	NSO	2017	2015	SNA 2008		NSO	2020
Guyana	Guyanese dollar	NSO	2021	2012[6]	SNA 1993		NSO	2021
Haiti	Haitian gourde	NSO	2020/21	2011/12	SNA 2008		NSO	2020/21
Honduras	Honduran lempira	CB	2021	2000	SNA 1993		CB	2021
Hong Kong SAR	Hong Kong dollar	NSO	2021	2019	SNA 2008	From 1980	NSO	2021
Hungary	Hungarian forint	NSO	2021	2015	ESA 2010	From 1995	IEO	2021
Iceland	Icelandic króna	NSO	2020	2015	ESA 2010	From 1990	NSO	2020
India	Indian rupee	NSO	2020/21	2011/12	SNA 2008		NSO	2019/20
Indonesia	Indonesian rupiah	NSO	2021	2010	SNA 2008		NSO	2021
Iran	Iranian rial	CB	2020/21	2016/17	SNA 2008		NSO and CB	2021/22
Iraq	Iraqi dinar	NSO	2020	2007	. . .		NSO	2021
Ireland	Euro	NSO	2021	2017	ESA 2010	From 1995	NSO	2021
Israel	Israeli new shekel	NSO	2021	2015	SNA 2008	From 1995	NSO	2021
Italy	Euro	NSO	2020	2015	ESA 2010	From 1980	NSO	2020
Jamaica	Jamaican dollar	NSO	2020	2007	SNA 1993		NSO	2020

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	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	2020	1986	CG	A	CB	2020	BPM 6
Croatia	MoF	2020	2014	CG,LG	A	CB	2020	BPM 6
Cyprus	NSO	2020	ESA 2010	CG,LG,SS	A	CB	2020	BPM 6
Czech Republic	MoF	2020	2014	CG,LG,SS	A	NSO	2020	BPM 6
Denmark	NSO	2020	2014	CG,LG,SS	A	NSO	2021	BPM 6
Djibouti	MoF	2020	2001	CG	A	CB	2020	BPM 5
Dominica	MoF	2020/21	1986	CG	C	CB	2020	BPM 6
Dominican Republic	MoF	2020	2014	CG,LG,SS,NMPC	A	CB	2020	BPM 6
Ecuador	CB and MoF	2020	1986	CG,SG,LG,SS,NFPC	Mixed	CB	2020	BPM 6
Egypt	MoF	2020/21	2001	CG,LG,SS,MPC	C	CB	2020/21	BPM 5
El Salvador	MoF and CB	2020	1986	CG,LG,SS,NFPC	C	CB	2020	BPM 6
Equatorial Guinea	MoF and MEP	2020	1986	CG	C	CB	2017	BPM 5
Eritrea	MoF	2018	2001	CG	C	CB	2018	BPM 5
Estonia	MoF	2021	1986/2001	CG,LG,SS	C	CB	2021	BPM 6
Eswatini	MoF	2019/20	2001	CG	A	CB	2020	BPM 6
Ethiopia	MoF	2020/21	1986	CG,SG,LG,NFPC	C	CB	2020/21	BPM 5
Fiji	MoF	2020/21	1986	CG	C	CB	2020	BPM 6
Finland	MoF	2020	2014	CG,LG,SS	A	NSO	2020	BPM 6
France	NSO	2021	2014	CG,LG,SS	A	CB	2021	BPM 6
Gabon	IMF staff	2020	2001	CG	A	CB	2020	BPM 5
The Gambia	MoF	2020	1986	CG	C	CB and IMF staff	2019	BPM 6
Georgia	MoF	2021	2001	CG,LG	C	CB	2021	BPM 6
Germany	NSO	2021	ESA 2010	CG,SG,LG,SS	A	CB	2021	BPM 6
Ghana	MoF	2018	2001	CG	C	CB	2019	BPM 5
Greece	NSO	2021	ESA 2010	CG,LG,SS	A	CB	2021	BPM 6
Grenada	MoF	2020	2014	CG	CB	CB	2020	BPM 6
Guatemala	MoF	2021	2001	CG	C	CB	2020	BPM 6
Guinea	MoF	2021	1986	CG	C	CB and MEP	2020	BPM 6
Guinea-Bissau	MoF	2020	2001	CG	A	CB	2020	BPM 6
Guyana	MoF	2021	1986	CG,SS,NFPC	C	CB	2021	BPM 6
Haiti	MoF	2020/21	1986	CG	C	CB	2020/21	BPM 5
Honduras	MoF	2021	2014	CG,LG,SS,other	Mixed	CB	2021	BPM 5
Hong Kong SAR	MoF	2020/21	2001	CG	C	NSO	2021	BPM 6
Hungary	MEP and NSO	2020	ESA 2010	CG,LG,SS,NMPC	A	CB	2020	BPM 6
Iceland	NSO	2020	2001	CG,LG,SS	A	CB	2020	BPM 6
India	MoF and IMF staff	2019/20	1986	CG,SG	C	CB	2019/20	BPM 6
Indonesia	MoF	2021	2001	CG,LG	C	CB	2021	BPM 6
Iran	MoF	2018/19	2001	CG	C	CB	2020/21	BPM 5
Iraq	MoF	2020	2001	CG	C	CB	2020	BPM 6
Ireland	MoF and NSO	2020	2001	CG,LG,SS	A	NSO	2021	BPM 6
Israel	MoF and NSO	2020	2014	CG,LG,SS	. . .	NSO	2021	BPM 6
Italy	NSO	2020	2001	CG,LG,SS	A	NSO	2020	BPM 6
Jamaica	MoF	2020/21	1986	CG	C	CB	2020	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	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	2020	2015	SNA 2008	From 1980	GAD	2020
Jordan	Jordanian dinar	NSO	2020	2016	SNA 2008		NSO	2020
Kazakhstan	Kazakhstani tenge	NSO	2020	2005	SNA 1993	From 1994	CB	2021
Kenya	Kenyan shilling	NSO	2020	2016	SNA 2008		NSO	2021
Kiribati	Australian dollar	NSO	2020	2006	SNA 2008		IMF Staff	2020
Korea	South Korean won	CB	2021	2015	SNA 2008	From 1980	NSO	2021
Kosovo	Euro	NSO	2020	2016	ESA 2010		NSO	2021
Kuwait	Kuwaiti dinar	MEP and NSO	2020	2010	SNA 1993		NSO and MEP	2021
Kyrgyz Republic	Kyrgyz som	NSO	2021	2005	SNA 1993	From 2010	NSO	2021
Lao P.D.R.	Lao kip	NSO	2020	2012	SNA 1993		NSO	2020
Latvia	Euro	NSO	2021	2015	ESA 2010	From 1995	NSO	2021
Lebanon	Lebanese pound	NSO	2019	2010	SNA 2008	From 2010	NSO	2021
Lesotho	Lesotho loti	NSO	2019/20	2012/13	SNA 2008		NSO	2021
Liberia	US dollar	IMF staff	2016	2018	SNA 1993		CB	2021
Libya	Libyan dinar	CB	2020	2007	SNA 1993		NSO	2021
Lithuania	Euro	NSO	2021	2015	ESA 2010	From 2005	NSO	2021
Luxembourg	Euro	NSO	2020	2015	ESA 2010	From 1995	NSO	2020
Macao SAR	Macanese pataca	NSO	2021	2019	SNA 2008	From 2001	NSO	2021
Madagascar	Malagasy ariary	NSO	2018	2007	SNA 1993		NSO	2021
Malawi	Malawian kwacha	NSO	2020	2017	SNA 2008		NSO	2021
Malaysia	Malaysian ringgit	NSO	2021	2015	SNA 2008		NSO	2021
Maldives	Maldivian rufiyaa	MoF and NSO	2020	2014	SNA 1993		CB	2021
Mali	CFA franc	NSO	2019	1999	SNA 1993		NSO	2020
Malta	Euro	NSO	2021	2015	ESA 2010	From 2000	NSO	2021
Marshall Islands	US dollar	NSO	2019/20	2003/04	SNA 2008		NSO	2019/20
Mauritania	New Mauritanian ouguiya	NSO	2020	2014	SNA 2008	From 2014	NSO	2020
Mauritius	Mauritian rupee	NSO	2020	2006	SNA 2008	From 1999	NSO	2020
Mexico	Mexican peso	NSO	2021	2013	SNA 2008		NSO	2021
Micronesia	US dollar	NSO	2017/18	2003/04	SNA 1993		NSO	2019/20
Moldova	Moldovan leu	NSO	2021	1995	SNA 2008		NSO	2021
Mongolia	Mongolian tögrög	NSO	2021	2015	SNA 2008		NSO	2021
Montenegro	Euro	NSO	2020	2006	ESA 2010		NSO	2020
Morocco	Moroccan dirham	NSO	2020	2007	SNA 2008	From 2007	NSO	2020
Mozambique	Mozambican metical	NSO	2020	2014	SNA 1993		NSO	2021
Myanmar	Myanmar kyat	MEP	2019/20	2015/16	. . .		NSO	2020/21
Namibia	Namibian dollar	NSO	2020	2015	SNA 1993		NSO	2021
Nauru	Australian dollar	IMF staff	2018/19	2006/07	SNA 2008		NSO and IMF Staff	2019/20
Nepal	Nepalese rupee	NSO	2019/20	2000/01	SNA 1993		CB	2020/21
The Netherlands	Euro	NSO	2021	2015	ESA 2010	From 1980	NSO	2021
New Zealand	New Zealand dollar	NSO	2021	2009[6]	SNA 2008	From 1987	NSO and IMF Staff	2021
Nicaragua	Nicaraguan córdoba	CB	2020	2006	SNA 1993	From 1994	CB	2020
Niger	CFA franc	NSO	2020	2015	SNA 2008		NSO	2020
Nigeria	Nigerian naira	NSO	2020	2010	SNA 2008		NSO	2020
North Macedonia	Macedonian denar	NSO	2021	2005	ESA 2010		NSO	2021
Norway	Norwegian krone	NSO	2021	2019	ESA 2010	From 1980	NSO	2021

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	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	2020	2014	CG,LG,SS	A	MoF	2020	BPM 6
Jordan	MoF	2020	2001	CG,NFPC	C	CB	2020	BPM 6
Kazakhstan	NSO	2021	2001	CG,LG	C	CB	2021	BPM 6
Kenya	MoF	2020	2001	CG	C	CB	2020	BPM 6
Kiribati	MoF	2020	1986	CG	C	NSO and IMF staff	2020	BPM 6
Korea	MoF	2019	2001	CG,SS	C	CB	2021	BPM 6
Kosovo	MoF	2021	. . .	CG,LG	C	CB	2021	BPM 6
Kuwait	MoF	2020	2014	CG,SS	Mixed	CB	2020	BPM 6
Kyrgyz Republic	MoF	2021	. . .	CG,LG,SS	C	CB	2020	BPM 6
Lao P.D.R.	MoF	2020	2001	CG	C	CB	2020	BPM 6
Latvia	MoF	2020	ESA 2010	CG,LG,SS	C	CB	2021	BPM 6
Lebanon	MoF	2020	2001	CG	C	CB and IMF staff	2020	BPM 5
Lesotho	MoF	2020/21	2001	CG,LG	C	CB	2020/21	BPM 6
Liberia	MoF	2020	2001	CG	A	CB	2020	BPM 5
Libya	CB	2021	1986	CG,SG,LG	C	CB	2021	BPM 5
Lithuania	MoF	2020	2014	CG,LG,SS	A	CB	2021	BPM 6
Luxembourg	MoF	2020	2001	CG,LG,SS	A	NSO	2020	BPM 6
Macao SAR	MoF	2020	2014	CG,SS	C	NSO	2020	BPM 6
Madagascar	MoF	2020	1986	CG	CB	CB	2020	BPM 6
Malawi	MoF	2021	2014	CG	C	NSO and GAD	2020	BPM 6
Malaysia	MoF	2020	2001	CG,SG,LG	C	NSO	2021	BPM 6
Maldives	MoF	2020	1986	CG	C	CB	2020	BPM 6
Mali	MoF	2019	2001	CG	Mixed	CB	2019	BPM 6
Malta	NSO	2020	2001	CG,SS	A	NSO	2020	BPM 6
Marshall Islands	MoF	2019/20	2001	CG,LG,SS	A	NSO	2019/20	BPM 6
Mauritania	MoF	2020	1986	CG	C	CB	2020	BPM 6
Mauritius	MoF	2020/21	2001	CG,LG,NFPC	C	CB	2020	BPM 6
Mexico	MoF	2021	2014	CG,SS,NMPC,NFPC	C	CB	2021	BPM 6
Micronesia	MoF	2017/18	2001	CG,SG	. . .	NSO	2017/18	BPM 6
Moldova	MoF	2021	1986	CG,LG	C	CB	2020	BPM 6
Mongolia	MoF	2021	2001	CG,SG,LG,SS	C	CB	2021	BPM 6
Montenegro	MoF	2020	1986	CG,LG,SS	C	CB	2020	BPM 6
Morocco	MEP	2020	2001	CG	A	GAD	2020	BPM 6
Mozambique	MoF	2020	2001	CG,SG	Mixed	CB	2020	BPM 6
Myanmar	MoF	2019/20	2014	CG,NFPC	C	IMF staff	2019/20	BPM 6
Namibia	MoF	2020	2001	CG	C	CB	2020	BPM 6
Nauru	MoF	2020/21	2001	CG	Mixed	IMF staff	2019/20	BPM 6
Nepal	MoF	2019/20	2001	CG	C	CB	2020/21	BPM 5
The Netherlands	MoF	2020	2001	CG,LG,SS	A	CB	2021	BPM 6
New Zealand	NSO	2020	2014	CG, LG	A	NSO	2021	BPM 6
Nicaragua	MoF	2020	1986	CG,LG,SS	C	IMF staff	2020	BPM 6
Niger	MoF	2020	1986	CG	A	CB	2020	BPM 6
Nigeria	MoF	2020	2001	CG,SG,LG	C	CB	2020	BPM 6
North Macedonia	MoF	2021	1986	CG,SG,SS	C	CB	2021	BPM 6
Norway	NSO and MoF	2021	2014	CG,LG,SS	A	NSO	2021	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	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	2020	2010	SNA 1993		NSO	2021
Pakistan	Pakistan rupee	NSO	2020/21	2015/16[6]	SNA 2008		NSO	2020/21
Palau	US dollar	MoF	2019/20	2018/19	SNA 1993		MoF	2019/20
Panama	US dollar	NSO	2020	2007	SNA 1993	From 2007	NSO	2021
Papua New Guinea	Papua New Guinea kina	NSO and MoF	2020	2013	SNA 2008		NSO	2020
Paraguay	Paraguayan guaraní	CB	2020	2014	SNA 2008		CB	2021
Peru	Peruvian sol	CB	2021	2007	SNA 2008		CB	2021
Philippines	Philippine peso	NSO	2021	2018	SNA 2008		NSO	2021
Poland	Polish zloty	NSO	2021	2015	ESA 2010	From 2015	NSO	2021
Portugal	Euro	NSO	2021	2016	ESA 2010	From 1980	NSO	2021
Puerto Rico	US dollar	NSO	2019/20	1954	. . .		NSO	2020
Qatar	Qatari riyal	NSO and MEP	2020	2018	SNA 1993		NSO and MEP	2020
Romania	Romanian leu	NSO	2020	2015	ESA 2010	From 2000	NSO	2020
Russia	Russian ruble	NSO	2021	2016	SNA 2008	From 1995	NSO	2021
Rwanda	Rwandan franc	NSO	2019	2017	SNA 2008		NSO	2019
Samoa	Samoan tala	NSO	2020/21	2012/13	SNA 2008		NSO	2020/21
San Marino	Euro	NSO	2020	2007	ESA 2010		NSO	2021
São Tomé and Príncipe	São Tomé and Príncipe dobra	NSO	2020	2008	SNA 1993		NSO	2020
Saudi Arabia	Saudi riyal	NSO	2021	2010	SNA 2008		NSO	2021
Senegal	CFA franc	NSO	2019	2014	SNA 2008		NSO	2020
Serbia	Serbian dinar	NSO	2020	2015	ESA 2010	From 2010	NSO	2020
Seychelles	Seychelles rupee	NSO	2020	2006	SNA 1993		NSO	2020
Sierra Leone	Sierra Leonean leone	NSO	2020	2006	SNA 2008	From 2010	NSO	2021
Singapore	Singapore dollar	NSO	2021	2015	SNA 2008	From 2015	NSO	2021
Slovak Republic	Euro	NSO	2020	2015	ESA 2010	From 1997	NSO	2021
Slovenia	Euro	NSO	2021	2010	ESA 2010	From 2000	NSO	2021
Solomon Islands	Solomon Islands dollar	CB	2017	2012	SNA 1993		NSO	2020
Somalia	US dollar	NSO	2020	2017	SNA 2008		NSO	2021
South Africa	South African rand	NSO	2021	2015	SNA 2008		NSO	2021
South Sudan	South Sudanese pound	NSO and IMF staff	2018	2010	SNA 1993		NSO	2019
Spain	Euro	NSO	2021	2015	ESA 2010	From 1995	NSO	2021
Sri Lanka	Sri Lankan rupee	NSO	2020	2010	SNA 2008		NSO	2021
St. Kitts and Nevis	Eastern Caribbean dollar	NSO	2020	2006	SNA 1993		NSO	2020
St. Lucia	Eastern Caribbean dollar	NSO	2020	2018	SNA 2008		NSO	2021
St. Vincent and the Grenadines	Eastern Caribbean dollar	NSO	2020	2018	SNA 1993		NSO	2021
Sudan	Sudanese pound	NSO	2019	1982	. . .		NSO	2019
Suriname	Surinamese dollar	NSO	2020	2015	SNA 2008		NSO	2021

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	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	2021	2001	CG	C	CB	2020	BPM 5
Pakistan	MoF	2020/21	1986	CG,SG,LG	C	CB	2020/21	BPM 6
Palau	MoF	2019/20	2001	CG	. . .	MoF	2019/20	BPM 6
Panama	MoF	2021	2014	CG,SG,LG,SS, NFPC	C	NSO	2020	BPM 6
Papua New Guinea	MoF	2020	1986	CG	C	CB	2020	BPM 5
Paraguay	MoF	2021	2001	CG,SG,LG,SS,MPC	C	CB	2020	BPM 6
Peru	CB and MoF	2021	2001	CG,SG,LG,SS	Mixed	CB	2021	BPM 5
Philippines	MoF	2021	2001	CG,LG,SS	C	CB	2021	BPM 6
Poland	MoF and NSO	2020	ESA 2010	CG,LG,SS	A	CB	2021	BPM 6
Portugal	NSO	2021	2001	CG,LG,SS	A	CB	2021	BPM 6
Puerto Rico	MEP	2019/20	2001	. . .	A	. . .	. . .	. . .
Qatar	MoF	2020	1986	CG,other	C	CB and IMF staff	2020	BPM 5
Romania	MoF	2020	2001	CG,LG,SS	C	CB	2020	BPM 6
Russia	MoF	2021	2014	CG,SG,SS	Mixed	CB	2021	BPM 6
Rwanda	MoF	2019	2014	CG	Mixed	CB	2019	BPM 6
Samoa	MoF	2020/21	2001	CG	A	CB	2020/21	BPM 6
San Marino	MoF	2020	. . .	CG	. . .	Other	2019	BPM 6
São Tomé and Príncipe	MoF and Customs	2020	2001	CG	C	CB	2020	BPM 6
Saudi Arabia	MoF	2021	2014	CG	C	CB	2020	BPM 6
Senegal	MoF	2020	2001	CG	C	CB and IMF staff	2020	BPM 6
Serbia	MoF	2020	1986/2001	CG,SG,LG,SS,other	C	CB	2020	BPM 6
Seychelles	MoF	2020	1986	CG,SS	C	CB	2020	BPM 6
Sierra Leone	MoF	2020	1986	CG	C	CB	2020	BPM 6
Singapore	MoF and NSO	2021/22	2014	CG	C	NSO	2021	BPM 6
Slovak Republic	NSO	2020	2001	CG,LG,SS	A	CB	2020	BPM 6
Slovenia	MoF	2021	2001	CG,LG,SS	A	CB	2021	BPM 6
Solomon Islands	MoF	2020	1986	CG	C	CB	2020	BPM 6
Somalia	MoF	2020	2001	CG	C	CB	2020	BPM 5
South Africa	MoF	2021	2001	CG,SG,SS,other	C	CB	2021	BPM 6
South Sudan	MoF and MEP	2019	. . .	CG	C	MoF, NSO, MEP, and IMF Staff	2018	BPM 6
Spain	MoF and NSO	2020	ESA 2010	CG,SG,LG,SS	A	CB	2021	BPM 6
Sri Lanka	MoF	2020	2001	CG	C	CB	2020	BPM 6
St. Kitts and Nevis	MoF	2021	1986	CG, SG	C	CB	2020	BPM 6
St. Lucia	MoF	2019/20	1986	CG	C	CB	2020	BPM 6
St. Vincent and the Grenadines	MoF	2021	1986	CG	C	CB	2020	BPM 6
Sudan	MoF	2019	2001	CG	Mixed	CB	2019	BPM 6
Suriname	MoF	2021	1986	CG	Mixed	CB	2020	BPM6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	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	2021	2020	ESA 2010	From 1993	NSO	2021
Switzerland	Swiss franc	NSO	2021	2015	ESA 2010	From 1980	NSO	2021
Syria	Syrian pound	NSO	2010	2000	SNA 1993		NSO	2011
Taiwan Province of China	New Taiwan dollar	NSO	2021	2016	SNA 2008		NSO	2021
Tajikistan	Tajik somoni	NSO	2020	1995	SNA 1993		NSO	2021
Tanzania	Tanzanian shilling	NSO	2021	2015	SNA 2008		NSO	2021
Thailand	Thai baht	MEP	2020	2002	SNA 1993	From 1993	MEP	2021
Timor-Leste	US dollar	NSO	2019	2015	SNA 2008		NSO	2020
Togo	CFA franc	NSO	2020	2016	SNA 1993		NSO	2021
Tonga	Tongan pa'anga	CB	2019/20	2016/17	SNA 1993		CB	2019/20
Trinidad and Tobago	Trinidad and Tobago dollar	NSO	2020	2012	SNA 1993		NSO	2020
Tunisia	Tunisian dinar	NSO	2020	2015	SNA 1993	From 2009	NSO	2021
Turkey	Turkish lira	NSO	2021	2009	ESA 2010	From 2009	NSO	2021
Turkmenistan	New Turkmen manat	IMF staff	2020	2006	. . .	From 2007	NSO	2020
Tuvalu	Australian dollar	PFTAC advisors	2019	2016	SNA 1993		NSO	2020
Uganda	Ugandan shilling	NSO	2020	2016	SNA 2008		CB	2021
Ukraine	Ukrainian hryvnia	NSO	2020	2016	SNA 2008	From 2005	NSO	2021
United Arab Emirates	U.A.E. dirham	NSO	2020	2010	SNA 2008		NSO	2021
United Kingdom	British pound	NSO	2020	2019	ESA 2010	From 1980	NSO	2021
United States	US dollar	NSO	2021	2012	SNA 2008	From 1980	NSO	2021
Uruguay	Uruguayan peso	CB	2020	2016	SNA 2008		NSO	2021
Uzbekistan	Uzbek som	NSO	2021	2020	SNA 1993		NSO and IMF staff	2021
Vanuatu	Vanuatu vatu	NSO	2019	2006	SNA 1993		NSO	2020
Venezuela	Venezuelan bolívar digital	CB	2018	1997	SNA 1993		CB	2020
Vietnam	Vietnamese dong	NSO	2020	2010	SNA 1993		NSO	2020
West Bank and Gaza	Israeli new shekel	NSO	2020	2015	SNA 2008		NSO	2021
Yemen	Yemeni rial	IMF staff	2020	1990	SNA 1993		NSO, CB, and IMF staff	2020
Zambia	Zambian kwacha	NSO	2020	2010	SNA 2008		NSO	2020
Zimbabwe	Zimbabwe dollar	NSO	2019	2012	SNA 2008		NSO	2019

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	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	2020	2001	CG,LG,SS	A	NSO	2021	BPM 6
Switzerland	MoF	2019	2001	CG,SG,LG,SS	A	CB	2021	BPM 6
Syria	MoF	2009	1986	CG	C	CB	2009	BPM 5
Taiwan Province of China	MoF	2020	2001	CG,LG,SS	C	CB	2021	BPM 6
Tajikistan	MoF	2020	1986	CG,LG,SS	C	CB	2020	BPM 6
Tanzania	MoF	2021	1986	CG,LG	C	CB	2021	BPM 6
Thailand	MoF	2019/20	2001	CG,BCG,LG,SS	A	CB	2020	BPM 6
Timor-Leste	MoF	2019	2001	CG	C	CB	2020	BPM 6
Togo	MoF	2020	2001	CG	C	CB	2020	BPM 6
Tonga	MoF	2019/20	2014	CG	C	CB and NSO	2019/20	BPM 6
Trinidad and Tobago	MoF	2020/21	1986	CG	C	CB	2020	BPM 6
Tunisia	MoF	2021	1986	CG	C	CB	2021	BPM 5
Turkey	MoF	2021	2001	CG,LG,SS,other	A	CB	2021	BPM 6
Turkmenistan	MoF	2020	1986	CG,LG	C	NSO	2020	BPM 6
Tuvalu	MoF	2019	. . .	CG	Mixed	IMF staff	2019	BPM 6
Uganda	MoF	2020	2001	CG	C	CB	2020	BPM 6
Ukraine	MoF	2021	2001	CG,LG,SS	C	CB	2020	BPM 6
United Arab Emirates	MoF	2020	2001	CG,BCG,SG,SS	Mixed	CB	2020	BPM 5
United Kingdom	NSO	2021	2001	CG,LG	A	NSO	2020	BPM 6
United States	MEP	2020	2014	CG,SG,LG	A	NSO	2020	BPM 6
Uruguay	MoF	2021	1986	CG,LG,SS,NFPC, NMPC	C	CB	2020	BPM 6
Uzbekistan	MoF	2021	2014	CG,SG,LG,SS	C	CB and MEP	2021	BPM 6
Vanuatu	MoF	2020	2001	CG	C	CB	2020	BPM 6
Venezuela	MoF	2017	2001	BCG,NFPC,SS,other	C	CB	2018	BPM 6
Vietnam	MoF	2020	2001	CG,SG,LG	C	CB	2020	BPM 5
West Bank and Gaza	MoF	2021	2001	CG	Mixed	NSO	2020	BPM 6
Yemen	MoF	2020	2001	CG,LG	C	IMF staff	2020	BPM 5
Zambia	MoF	2021	1986	CG	C	CB	2020	BPM 6
Zimbabwe	MoF	2019	1986	CG	C	CB and MoF	2020	BPM 6

Note: BPM = *Balance of Payments Manual*; CPI = consumer price index; ESA = European System of National Accounts; SNA = System of National Accounts.
[1]CB = central bank; Customs = Customs Authority; GAD = General Administration Department; IEO = international economic organization; 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.
[2]National 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.
[3]Use 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.
[4]BCG = 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.
[5]Accounting standard: A = accrual accounting; C = cash accounting; CB = commitments basis accounting; Mixed = combination of accrual and cash accounting.
[6]Base 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 B4 to B6 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 and budget plans 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 FY2022/23 budget published by the Commonwealth Government in March 2022, the FY2021/22 budget published by each state/territory government, the FY2021/22 budget published by some state governments, and the IMF staff's estimates and projections.

Austria: Fiscal projections are based on the 2022 budget, the Austria Stability Programme, the Austria National Reform Programme 2021, the new EU recovery funds, and the latest announcement on fiscal measures.

Belgium: Projections are based on the 2021–24 Stability Program, the Draft Budgetary Plan for 2022, and other available information on the authorities' fiscal plans, with adjustments for the IMF staff's assumptions.

Brazil: Fiscal projections for 2021 reflect policy announcements.

Canada: Projections use the baseline forecasts from the Economic and Fiscal Update 2021 and the latest provincial budgets. The IMF staff makes some adjustments to these forecasts, including 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: After a significant tightening in 2021, the pace of fiscal tightening is projected to slow in 2022 based on Article IV consultation findings and public statements by the authorities.

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 2022 onward are based on the measures of the 2018–22 budget laws adjusted for differences in revenue projections and assumptions on macroeconomic and financial variables.

[1] The 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)*

Germany: The IMF staff's projections for 2022 and beyond are based on the provisional 2022 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. The estimate of gross debt includes portfolios of impaired assets and noncore business transferred to institutions that are winding up as well as other financial sector and EU support operations.

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 of expenditures.

Hungary: Fiscal projections include the IMF staff's projections of the macroeconomic framework and fiscal policy plans announced in the 2020 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 in FY2020/21 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 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 2022.

Israel: Projections differ from the authorities' medium-term budget targets, assuming more modest spending cuts.

Italy: The IMF staff's estimates and projections are informed by the fiscal plans included in the government's 2021 budget and amendments. The stock of maturing postal bonds is included in the debt projections.

Japan: The projections reflect fiscal measures already announced by the government, with adjustments for the IMF staff's assumptions.

Korea: The forecast incorporates the overall fiscal balance in the 2022 annual budget and supplementary budget, the medium-term fiscal plan announced with the 2022 budget, 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 2022 are informed by the estimates in the 2022 budget proposal; projections for 2023 onward assume continued compliance with rules established in the Fiscal Responsibility Law.

The Netherlands: Fiscal projections for 2021–27 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 Half Year Economic and Fiscal Update 2021 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.

Puerto Rico: Fiscal projections are based on the Puerto Rico Fiscal and Economic Growth Plans (FEGPs), which were prepared in January 2022 and are certified by the Financial Oversight and Management Board. The 2022 Fiscal Plan calls for a series of structural reforms, such as earned income tax credit benefits; the Natural Assistance Program; a lowering of barriers to entry for foreign firms;

Box A1 *(continued)*

and investment in education, the power sector, and infrastructure. The new fiscal plan also pays particular attention to allocating strategic investment to emergency response and frontline service delivery, as the island is highly vulnerable to natural disasters and battling an ongoing pandemic. This plan represents an unprecedented level of fiscal support—over 100 percent of Puerto Rico's gross national product. The Fiscal Plan also focuses on the implementation of fiscal measures (centralization of fiscal authority, improvement of agencies' efficiency, Medicaid reform, pension reform, reduction of appropriations, enhanced tax compliance, and optimized taxes and fees) that will result in a smaller government deficit in the long term. The IMF staff's fiscal projections rely on the information presented above as well as on the assumption that the fiscal position will deteriorate over time. Previous WEO submissions (prior to fall 2021) relied on the assumption of fiscal consolidation. Although IMF policy assumptions are similar to those in the FEGP scenario with full measures, the IMF staff's projections of fiscal revenues, expenditures, and balance are different from the FEGPs'. This stems from two main differences in methodologies: first, while the IMF staff's projections are on an accrual basis, the FEGPs' are on a cash basis. Second, the IMF staff and the FEGP make very different macroeconomic assumptions.

Russia: The fiscal rule has been suspended by the government in response to the sanctions imposed after the invasion of Ukraine. The projection assumes an increase in discretionary spending equal to the amount that would otherwise have been saved according to the fiscal rule and a decline in revenues due to the projected deep recession.

Saudi Arabia: The IMF staff's baseline fiscal projections are primarily based 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 end-2021. FY2022 projections are based on the initial FY2022 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) the increase of the Good and Services Tax (GST) from 7 percent to 8 percent on 1 January 2023, and to 9 percent on 1 January 2024; (2) the increase of the property tax in 2023 for non-owner-occupied properties (from 10–20 percent to 12–36 percent) and owner-occupied properties with an annual value in excess of $30,000 (from 4–16 percent to 6–32 percent); and (3) the increase of the carbon tax from S$5 per tonne of CO_2 emissions to S$25 per tonne in 2024 and 2025 and $45 per tonne in 2026 and 2027.

South Africa: Fiscal assumptions draw on the 2022 Budget Review. 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 for 2021 include COVID-19–related support measures, the legislated increase in pensions, and the legislated revenue measures. Fiscal projections from 2022 onward assume no policy changes. Disbursements under the EU Recovery and Resilience Facility are reflected in the projections for 2021–24.

Sweden: Fiscal estimates for 2021 are based on preliminary information on the fall 2020 budget bill. The impact of cyclical developments on the fiscal accounts is calculated using the 2014 Organisation for Economic Co-operation and Development elasticity[2] to take into account output and employment gaps.

[2] Robert Price, Thai-Thanh Dang, and Yvan Guillemette, "New Tax and Expenditure Elasticity Estimates for EU Budget Surveillance," OECD Economics Department Working Paper 1174 (Paris: OECD Publishing, 2014).

Box A1 *(continued)*

Switzerland: The authorities' announced discretionary stimulus—as reflected in the fiscal projections for 2021 and 2022—is permitted within the context of the debt brake rule in the event of "exceptional circumstances."

Turkey: The basis for the projections in the WEO and *Fiscal Monitor* 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 latest GDP data published by the Office of National Statistics on February 11, 2022, and forecasts by the Office for Budget Responsibility from October 27, 2021. Revenue projections are adjusted for differences between the IMF staff's forecasts of macroeconomic variables (such as GDP growth and inflation) and the forecasts of these variables assumed in the authorities' fiscal projections. Projections assume that there is some additional fiscal consolidation relative to the policies announced to date starting in FY2023/24 with the goal of complying with the new fiscal rules announced at the time of the Spending Review on October 27, 2021, and to secure public debt sustainability. The IMF staff's data exclude public sector banks and the effect of transferring assets from the Royal Mail Pension Plan to the public sector in April 2012. Real government consumption and investment are part of the real GDP path, which, according to the IMF staff, may or may not be the same as projected by the UK Office for Budget Responsibility. Data are presented on a calendar year basis.

United States: Fiscal projections are based on the July 2021 Congressional Budget Office baseline, adjusted for the IMF staff's policy and macroeconomic assumptions. Projections incorporate the effects of the proposed American Jobs Plan; the American Families Plan; the Bipartisan Infrastructure Plan; the legislated American Rescue Plan; the Coronavirus Preparedness and Response Supplemental Appropriations Act; the Families First Coronavirus Response Act; the Coronavirus Aid, Relief, and Economic Security Act; and the Paycheck Protection Program and Health Care Enhancement Act. Finally, fiscal projections are adjusted to reflect the IMF staff's forecasts for key macroeconomic and financial variables and different accounting treatment of financial sector support and of defined-benefit pension plans, and are converted to a general government basis.

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*, it is assumed that the *three-month government bond yield* for the United States will average 0.9 percent in 2022 and 2.4 percent in 2023, for the euro area will average –0.7 percent in 2022 and 0.0 in 2023, and for Japan will average 0.0 percent in 2022 and 0.1 percent in 2023. Further, it is assumed that the *10-year government bond yield* for the United States will average 2.6 percent in 2022 and 3.4 percent in 2023, for the euro area will average 0.4 percent in 2022 and 0.6 percent in 2023, and for Japan will average 0.3 percent in 2022 and 0.4 percent in 2023.

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.

Austria: Monetary growth projections are in proportion to nominal GDP growth.

Brazil: Monetary policy assumptions are consistent with the convergence of inflation toward the middle of the target range by the end of 2023.

Box A1 *(continued)*

Canada: Monetary policy assumptions reflect the latest decision by the Bank of Canada and its updated forecast. In particular, the Bank of Canada has started raising interest rates and confirmed the increasing rate path into the future. The monetary policy response in the current forecast reflects the new data and the war in Ukraine. While the headline inflation is assumed to increase significantly, the policy response is muted due to the forward-looking nature of the monetary policy, reacting mostly to the core inflation at the monetary policy horizon.

Chile: Monetary policy assumptions are consistent with attaining the inflation target.

China: The overall monetary policy stance was moderately tight in 2021, but it is expected to be moderately accommodative in 2022.

Denmark: Monetary policy is to maintain the peg to the euro.

Euro area: Monetary policy assumptions for euro area member countries are in line with market expectations.

Greece: Broad money projections are based on monetary financial institution balance sheets and deposit flow assumptions.

Hong Kong Special Administrative Region: The IMF staff assumes that the currency board system will remain intact.

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.

Italy: The IMF staff's estimates and projections are informed by the actual outturn and policy plans by the Bank of Italy and the European Central Bank's monetary policy stance forecast from the IMF's euro area team.

Japan: Monetary policy assumptions are in line with market expectations.

Korea: The projections assume that the policy rate evolves in line with market expectations.

Mexico: Monetary policy assumptions are consistent with attaining the inflation target.

The Netherlands: Monetary projections are based on the IMF staff's estimated six-month euro London interbank offered rate projections.

New Zealand: Monetary projections are based on the IMF staff's analysis and expected inflation path.

Portugal: Monetary policy assumptions are based on the country desk officers' spreadsheets, given input projections for the real and fiscal sectors.

Russia: Monetary projections assume that the Central Bank of the Russian Federation is adopting a tight monetary policy stance. The IMF staff team regards this as the right policy stance given the hike in inflation.

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.

Spain: Monetary growth projections are proportionate to nominal GDP growth.

Sweden: Monetary projections are in line with Riksbank projections.

Switzerland: The projections assume no change in the policy rate in 2022–23.

Turkey: The baseline assumes that the monetary policy stance remains 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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[1] When countries are not listed alphabetically, they are ordered on the basis of economic size.

Table A1. Summary of World Output[1]

(Annual percent change)

	Average 2004–13	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	2023	2027
World	**4.1**	**3.5**	**3.4**	**3.3**	**3.7**	**3.6**	**2.9**	**–3.1**	**6.1**	**3.6**	**3.6**	**3.3**
Advanced Economies	**1.6**	**2.0**	**2.3**	**1.8**	**2.5**	**2.3**	**1.7**	**–4.5**	**5.2**	**3.3**	**2.4**	**1.6**
United States	1.8	2.3	2.7	1.7	2.3	2.9	2.3	–3.4	5.7	3.7	2.3	1.7
Euro Area	0.9	1.4	2.0	1.9	2.6	1.8	1.6	–6.4	5.3	2.8	2.3	1.3
Japan	0.7	0.3	1.6	0.8	1.7	0.6	–0.2	–4.5	1.6	2.4	2.3	0.4
Other Advanced Economies[2]	2.7	3.0	2.2	2.3	2.9	2.5	1.9	–3.9	5.5	3.4	2.5	2.0
Emerging Market and Developing Economies	**6.4**	**4.7**	**4.3**	**4.4**	**4.7**	**4.6**	**3.7**	**–2.0**	**6.8**	**3.8**	**4.4**	**4.3**
Regional Groups												
Emerging and Developing Asia	8.5	6.9	6.8	6.8	6.6	6.4	5.3	–0.8	7.3	5.4	5.6	5.2
Emerging and Developing Europe	4.3	1.8	1.0	1.9	4.1	3.4	2.5	–1.8	6.7	–2.9	1.3	2.4
Latin America and the Caribbean	4.0	1.3	0.4	–0.6	1.4	1.2	0.1	–7.0	6.8	2.5	2.5	2.4
Middle East and Central Asia	5.0	3.3	2.8	4.1	2.4	2.7	2.2	–2.9	5.7	4.6	3.7	3.7
Sub-Saharan Africa	5.6	5.0	3.2	1.5	3.0	3.3	3.1	–1.7	4.5	3.8	4.0	4.4
Analytical Groups												
By Source of Export Earnings												
Fuel	5.4	3.1	1.4	1.6	0.4	0.6	0.4	–4.5	5.6	4.6	3.2	2.8
Nonfuel	6.6	5.0	4.7	4.8	5.3	5.1	4.1	–1.7	6.9	3.7	4.5	4.5
Of Which, Primary Products	4.8	2.2	2.9	1.9	2.9	1.9	1.2	–5.2	7.8	3.4	3.4	3.4
By External Financing Source												
Net Debtor Economies	5.4	4.5	4.1	4.1	4.7	4.6	3.4	–3.7	6.4	4.4	4.8	4.7
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2016–20	4.7	2.4	1.2	2.6	3.3	3.5	3.4	–0.9	3.2	0.2	5.0	5.5
Other Groups												
European Union	1.2	1.7	2.5	2.1	3.0	2.2	2.0	–5.9	5.4	2.9	2.5	1.7
Middle East and North Africa	4.7	3.1	2.6	4.4	1.8	2.0	1.7	–3.3	5.8	5.0	3.6	3.5
Emerging Market and Middle-Income Economies	6.4	4.6	4.3	4.5	4.7	4.6	3.6	–2.2	7.0	3.8	4.3	4.2
Low-Income Developing Countries	6.1	6.1	4.8	3.9	4.9	5.1	5.3	0.2	4.0	4.6	5.4	5.6
Memorandum												
Median Growth Rate												
Advanced Economies	1.9	2.3	2.2	2.2	3.0	2.8	2.1	–4.3	5.2	2.9	2.6	2.0
Emerging Market and Developing Economies	4.7	3.8	3.3	3.4	3.7	3.5	3.2	–3.6	4.0	3.5	3.8	3.5
Emerging Market and Middle-Income Economies	4.1	3.3	3.0	3.0	2.8	3.0	2.4	–6.1	4.4	3.3	3.6	3.0
Low-Income Developing Countries	5.3	5.0	4.3	4.4	4.5	4.4	4.5	–0.6	3.5	3.8	4.5	5.0
Output per Capita[3]												
Advanced Economies	1.0	1.5	1.7	1.3	2.0	1.9	1.3	–5.0	5.0	3.0	2.1	1.3
Emerging Market and Developing Economies	4.7	3.1	2.8	2.8	3.3	3.3	2.4	–3.3	5.9	2.7	3.3	3.2
Emerging Market and Middle-Income Economies	4.9	3.2	3.0	3.1	3.5	3.6	2.5	–3.2	6.1	3.1	3.5	3.5
Low-Income Developing Countries	3.6	3.8	2.2	1.5	2.6	2.7	2.9	–2.1	2.5	2.4	3.1	3.4
World Growth Rate Based on Market Exchange Rates	**2.7**	**2.8**	**2.8**	**2.6**	**3.2**	**3.2**	**2.5**	**–3.5**	**5.8**	**3.5**	**3.1**	**2.7**
Value of World Output (billions of US dollars)												
At Market Exchange Rates	61,955	79,322	75,043	76,267	80,945	86,085	87,536	85,239	96,293	103,867	110,751	136,384
At Purchasing Power Parities	84,652	109,350	111,568	115,863	122,024	129,366	135,346	132,487	146,124	160,244	170,830	211,530

[1]Real GDP.
[2]Excludes euro area countries, Japan, and the United States.
[3]Output per capita is in international dollars at purchasing power parity.

Table A2. Advanced Economies: Real GDP and Total Domestic Demand[1]

(Annual percent change)

	Average									Projections			Q4 over Q4[2]	Projections	
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027	2021:Q4	2022:Q4	2023:Q4
Real GDP															
Advanced Economies	**1.6**	**2.0**	**2.3**	**1.8**	**2.5**	**2.3**	**1.7**	**–4.5**	**5.2**	**3.3**	**2.4**	**1.6**	**4.7**	**2.5**	**2.0**
United States	1.8	2.3	2.7	1.7	2.3	2.9	2.3	–3.4	5.7	3.7	2.3	1.7	5.6	2.8	1.7
Euro Area	0.9	1.4	2.0	1.9	2.6	1.8	1.6	–6.4	5.3	2.8	2.3	1.3	4.6	1.8	2.3
Germany	1.3	2.2	1.5	2.2	2.7	1.1	1.1	–4.6	2.8	2.1	2.7	1.1	1.8	2.4	2.5
France	1.2	1.0	1.0	1.0	2.4	1.8	1.8	–8.0	7.0	2.9	1.4	1.4	5.4	0.9	1.5
Italy	–0.3	0.0	0.8	1.3	1.7	0.9	0.5	–9.0	6.6	2.3	1.7	0.5	6.2	0.5	2.2
Spain	0.6	1.4	3.8	3.0	3.0	2.3	2.1	–10.8	5.1	4.8	3.3	1.6	5.5	2.3	4.0
The Netherlands	1.1	1.4	2.0	2.2	2.9	2.4	2.0	–3.8	5.0	3.0	2.0	1.5	6.4	0.4	2.9
Belgium	1.6	1.6	2.0	1.3	1.6	1.8	2.1	–5.7	6.3	2.1	1.4	1.2	5.6	0.6	1.6
Ireland	1.6	8.7	25.2	2.0	8.9	9.0	4.9	5.9	13.5	5.2	5.0	3.0	10.0	13.3	0.0
Austria	1.5	0.7	1.0	2.0	2.3	2.5	1.5	–6.7	4.5	2.6	3.0	1.8	5.6	1.2	4.9
Portugal	–0.1	0.8	1.8	2.0	3.5	2.8	2.7	–8.4	4.9	4.0	2.1	1.9	5.9	0.3	3.8
Greece	–1.7	0.5	–0.2	–0.5	1.1	1.7	1.8	–9.0	8.3	3.5	2.6	1.2	7.7	3.5	1.8
Finland	1.2	–0.4	0.5	2.8	3.2	1.1	1.2	–2.3	3.3	1.6	1.7	1.3	3.0	0.9	1.7
Slovak Republic	4.2	2.6	4.8	2.1	3.0	3.8	2.6	–4.4	3.0	2.6	5.0	2.8	1.2	4.0	3.9
Lithuania	3.3	3.5	2.0	2.5	4.3	4.0	4.6	–0.1	4.9	1.8	2.6	2.5	5.2	0.8	3.6
Slovenia	1.5	2.8	2.2	3.2	4.8	4.4	3.3	–4.2	8.1	3.7	3.0	2.7	10.8	–0.3	3.5
Luxembourg	2.6	2.6	2.3	5.0	1.3	2.0	3.3	–1.8	6.9	1.8	2.1	2.5	4.8	1.8	2.3
Latvia	2.7	1.9	3.9	2.4	3.3	4.0	2.5	–3.8	4.7	1.0	2.4	3.3	2.7	3.0	0.5
Estonia	2.6	3.0	1.9	3.2	5.8	4.1	4.1	–3.0	8.3	0.2	2.2	3.3	8.8	–0.8	2.2
Cyprus	1.3	–1.8	3.4	6.5	5.9	5.7	5.3	–5.0	5.5	2.1	3.5	2.9	5.9	0.9	5.1
Malta	2.9	7.6	9.6	3.4	11.1	6.0	5.9	–8.3	9.4	4.8	4.5	3.3	10.0	1.9	6.1
Japan	0.7	0.3	1.6	0.8	1.7	0.6	–0.2	–4.5	1.6	2.4	2.3	0.4	0.4	3.5	0.8
United Kingdom	1.2	3.0	2.6	2.3	2.1	1.7	1.7	–9.3	7.4	3.7	1.2	1.5	6.6	1.1	1.5
Korea	4.0	3.2	2.8	2.9	3.2	2.9	2.2	–0.9	4.0	2.5	2.9	2.3	4.1	2.0	3.4
Canada	1.9	2.9	0.7	1.0	3.0	2.8	1.9	–5.2	4.6	3.9	2.8	1.6	3.3	3.5	2.2
Taiwan Province of China	4.2	4.7	1.5	2.2	3.3	2.8	3.1	3.4	6.3	3.2	2.9	2.1	3.9	3.5	2.3
Australia	3.0	2.6	2.3	2.7	2.4	2.8	2.0	–2.2	4.7	4.2	2.5	2.6	4.2	3.5	2.1
Switzerland	2.2	2.4	1.6	2.0	1.7	2.9	1.2	–2.5	3.7	2.2	1.4	1.2	3.9	1.6	0.7
Sweden	2.0	2.7	4.5	2.1	2.6	2.0	2.0	–2.9	4.8	2.9	2.7	2.0	5.2	1.7	3.2
Singapore	6.7	3.9	3.0	3.6	4.7	3.7	1.1	–4.1	7.6	4.0	2.9	2.5	6.1	2.3	3.6
Hong Kong SAR	4.5	2.8	2.4	2.2	3.8	2.8	–1.7	–6.5	6.4	0.5	4.9	2.8	4.8	5.1	0.4
Czech Republic	2.5	2.3	5.4	2.5	5.2	3.2	3.0	–5.8	3.3	2.3	4.2	2.5	3.6	0.4	6.9
Israel	4.4	4.1	2.3	4.5	4.4	4.0	3.8	–2.2	8.2	5.0	3.5	3.5	9.6	1.2	4.1
Norway	1.6	2.0	2.0	1.1	2.3	1.1	0.7	–0.7	3.9	4.0	2.6	1.3	4.8	2.7	2.4
Denmark	0.9	1.6	2.3	3.2	2.8	2.0	2.1	–2.1	4.1	2.3	1.7	1.8	4.4	0.7	2.1
New Zealand	2.1	3.8	3.7	4.0	3.5	3.4	2.9	–2.1	5.6	2.7	2.6	2.3	3.1	3.3	1.9
Puerto Rico	–0.7	–1.2	–1.0	–1.3	–2.9	–4.2	1.5	–3.9	1.0	4.8	0.4	0.0	. . .	. . .	. . .
Macao SAR	13.1	–2.0	–21.5	–0.7	10.0	6.5	–2.5	–54.0	18.0	15.5	23.3	3.5	. . .	. . .	. . .
Iceland	2.7	1.7	4.4	6.3	4.2	4.9	2.4	–7.1	4.3	3.3	2.3	2.3	3.9	2.6	2.5
Andorra	–0.3	2.5	1.4	3.7	0.3	1.6	2.0	–11.2	8.9	4.5	2.7	1.5	. . .	. . .	. . .
San Marino	–1.7	–0.6	2.7	2.3	0.3	1.5	2.1	–6.6	5.2	1.3	1.1	1.3	. . .	. . .	. . .
Memorandum															
Major Advanced Economies	1.3	1.8	2.1	1.5	2.2	2.1	1.6	–4.9	5.1	3.2	2.2	1.4	4.5	2.5	1.7
Real Total Domestic Demand															
Advanced Economies	**1.4**	**2.1**	**2.6**	**2.0**	**2.5**	**2.3**	**2.1**	**–4.4**	**5.2**	**3.5**	**2.3**	**1.6**	**5.1**	**2.5**	**2.1**
United States	1.5	2.5	3.4	1.8	2.4	3.1	2.4	–3.0	6.9	4.0	2.1	1.6	6.1	3.0	1.5
Euro Area	0.5	1.3	2.3	2.4	2.3	1.8	2.5	–6.2	4.2	2.9	2.5	1.4	5.2	1.3	3.0
Germany	0.9	1.7	1.4	3.1	2.6	1.7	1.8	–4.0	2.2	2.7	3.6	1.3	3.0	4.0	2.7
France	1.3	1.5	1.5	1.4	2.5	1.4	2.1	–6.8	6.6	3.0	1.2	1.4	5.7	0.8	1.4
Italy	–0.7	0.1	1.2	1.8	1.8	1.3	–0.2	–8.5	6.8	2.8	2.1	0.6	7.8	0.2	3.2
Spain	0.1	1.9	4.1	2.1	3.3	3.0	1.6	–8.9	4.7	4.1	3.0	1.6	3.8	3.2	3.0
Japan	0.6	0.3	1.1	0.3	1.1	0.6	0.2	–3.7	0.6	2.0	2.1	0.4	0.4	3.0	0.8
United Kingdom	1.2	3.5	3.2	3.1	1.9	1.2	1.6	–10.1	8.5	5.4	0.8	1.5	4.8	2.9	1.4
Canada	2.9	1.7	–0.2	0.4	4.1	2.5	1.2	–6.4	6.0	5.9	2.3	1.7	4.5	6.0	0.3
Other Advanced Economies[3]	3.0	2.9	2.6	2.9	3.6	2.7	1.5	–2.7	4.8	3.2	3.0	2.5	5.1	2.1	2.9
Memorandum															
Major Advanced Economies	1.2	1.9	2.4	1.7	2.2	2.2	1.8	–4.5	5.6	3.6	2.1	1.3	5.0	2.9	1.6

[1]In this and other tables, when countries are not listed alphabetically, they are ordered on the basis of economic size.
[2]From the fourth quarter of the preceding year.
[3]Excludes 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	
	2004–13	2014–23	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Private Consumer Expenditure												
Advanced Economies	**1.5**	**1.8**	**1.8**	**2.5**	**2.1**	**2.2**	**2.2**	**1.6**	**–5.8**	**5.3**	**3.8**	**2.4**
United States	1.8	2.4	2.7	3.3	2.5	2.4	2.9	2.2	–3.8	7.9	3.2	1.4
Euro Area	0.6	1.2	0.9	1.9	2.0	1.8	1.5	1.3	–7.9	3.5	4.0	3.3
Germany	0.7	1.4	1.1	1.9	2.4	1.4	1.4	1.6	–5.9	0.1	4.7	5.6
France	1.3	1.2	0.9	1.4	1.6	1.7	0.8	1.9	–7.2	4.8	4.5	1.7
Italy	–0.3	0.4	0.1	1.9	1.2	1.5	1.0	0.2	–10.6	5.2	2.3	2.1
Spain	0.2	1.3	1.7	2.9	2.7	3.0	1.7	1.0	–12.0	4.6	5.2	3.4
Japan	0.9	0.0	–0.9	–0.2	–0.4	1.1	0.2	–0.5	–5.2	1.3	2.2	2.7
United Kingdom	1.2	1.6	2.6	3.6	3.7	1.6	2.4	1.3	–10.6	6.2	5.6	1.1
Canada	2.9	2.4	2.6	2.3	2.1	3.7	2.6	1.4	–6.1	5.1	9.6	1.2
Other Advanced Economies[1]	2.9	2.1	2.5	2.9	2.6	2.8	2.8	1.8	–5.6	4.3	3.7	3.6
Memorandum												
Major Advanced Economies	1.4	1.7	1.7	2.4	2.0	2.0	2.1	1.5	–5.5	5.6	3.8	2.0
Public Consumption												
Advanced Economies	**1.3**	**1.7**	**0.6**	**1.7**	**2.0**	**0.8**	**1.5**	**2.4**	**1.8**	**3.3**	**1.3**	**1.2**
United States	0.5	1.1	–0.8	1.6	1.9	0.0	1.2	2.0	2.0	1.1	0.4	1.4
Euro Area	1.3	1.4	0.8	1.4	1.9	1.1	1.1	1.8	1.1	3.8	0.7	0.8
Germany	1.5	2.1	1.7	2.9	4.0	1.7	1.0	3.0	3.5	3.1	–0.5	0.4
France	1.6	1.2	1.3	1.0	1.4	1.4	0.8	1.0	–3.2	6.3	1.0	0.9
Italy	–0.2	0.1	–0.6	–0.6	0.7	–0.1	0.1	–0.5	0.5	1.0	1.0	–0.2
Spain	2.8	1.5	–0.7	2.0	1.0	1.0	2.3	2.0	3.3	3.1	0.6	0.4
Japan	1.3	1.5	1.0	1.9	1.6	0.1	1.0	1.9	2.3	2.1	3.0	0.4
United Kingdom	1.6	2.1	2.0	1.3	0.5	0.6	0.4	4.2	–5.9	14.3	3.4	1.2
Canada	1.8	2.1	0.6	1.4	1.8	2.1	3.2	1.7	0.0	4.9	2.4	3.4
Other Advanced Economies[1]	2.8	3.2	2.7	2.8	3.5	2.4	3.5	3.8	4.6	4.2	3.0	1.5
Memorandum												
Major Advanced Economies	0.9	1.3	0.2	1.6	1.8	0.4	1.1	2.0	1.1	3.0	1.0	1.1
Gross Fixed Capital Formation												
Advanced Economies	**1.0**	**2.8**	**3.4**	**3.6**	**2.6**	**3.8**	**3.0**	**3.0**	**–3.7**	**5.4**	**3.6**	**3.8**
United States	1.3	3.6	5.1	3.7	2.1	3.8	4.4	3.1	–1.5	6.1	4.2	5.7
Euro Area	–0.2	2.6	1.4	4.7	4.0	3.9	3.1	6.8	–7.0	4.3	2.8	2.7
Germany	1.4	2.0	3.2	1.7	3.8	2.6	3.4	1.8	–2.2	1.5	1.7	2.4
France	1.0	1.9	0.0	0.9	2.5	5.0	3.3	4.1	–8.9	11.5	1.9	0.3
Italy	–2.5	2.6	–2.2	1.8	4.0	3.2	3.1	1.2	–9.1	17.0	5.5	3.7
Spain	–2.6	3.2	4.1	4.9	2.4	6.8	6.3	4.5	–9.5	4.3	4.5	5.2
Japan	–0.5	0.5	2.2	2.3	1.2	1.6	0.4	1.0	–4.6	–1.5	0.5	2.3
United Kingdom	0.5	2.3	6.8	6.3	4.7	3.3	–0.1	0.5	–9.5	5.9	6.3	–0.3
Canada	3.8	1.1	2.3	–5.2	–4.7	3.3	2.5	0.0	–2.8	7.2	5.2	3.9
Other Advanced Economies[1]	3.4	2.7	2.6	2.2	3.0	4.9	2.0	0.7	–1.6	6.2	3.6	3.0
Memorandum												
Major Advanced Economies	0.8	2.7	3.7	2.8	2.2	3.4	3.1	2.3	–3.7	5.7	3.6	3.9

Table A3. Advanced Economies: Components of Real GDP *(continued)*

(Annual percent change)

	Averages										Projections	
	2004–13	2014–23	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Final Domestic Demand												
Advanced Economies	**1.4**	**2.0**	**1.9**	**2.6**	**2.2**	**2.3**	**2.2**	**2.2**	**–4.0**	**5.0**	**3.2**	**2.4**
United States	1.5	2.5	2.7	3.1	2.3	2.4	3.0	2.4	–2.5	6.6	3.0	2.3
Euro Area	0.6	1.5	1.0	2.3	2.4	2.1	1.7	2.6	–5.8	3.7	3.0	2.6
Germany	1.0	1.7	1.7	2.1	3.1	1.7	1.8	1.9	–3.0	1.1	2.7	3.7
France	1.3	1.3	0.8	1.2	1.8	2.3	1.4	2.2	–6.7	6.7	3.0	1.2
Italy	–0.7	0.8	–0.4	1.4	1.6	1.5	1.2	0.3	–8.2	6.5	2.7	2.0
Spain	0.1	1.7	1.6	3.1	2.3	3.3	2.7	1.9	–8.5	4.2	4.1	3.1
Japan	0.6	0.5	0.1	0.8	0.3	1.0	0.4	0.3	–3.6	0.8	2.4	2.1
United Kingdom	1.1	1.8	3.2	3.6	3.3	1.7	1.6	1.7	–9.5	7.7	5.3	0.9
Canada	2.9	1.9	2.1	0.3	0.5	3.3	2.7	1.2	–4.1	5.5	5.7	2.3
Other Advanced Economies[1]	2.9	2.4	2.6	2.7	2.9	3.4	2.4	1.8	–2.7	4.7	3.4	3.0
Memorandum												
Major Advanced Economies	1.2	1.9	1.9	2.4	2.0	2.1	2.1	1.8	–4.0	5.3	3.2	2.2
Stock Building[2]												
Advanced Economies	**0.0**	**0.0**	**0.1**	**0.0**	**–0.2**	**0.2**	**0.1**	**–0.1**	**–0.4**	**0.3**	**0.3**	**–0.1**
United States	0.1	0.0	–0.1	0.3	–0.5	0.0	0.2	0.1	–0.5	0.3	0.9	–0.2
Euro Area	–0.1	0.0	0.4	0.0	0.0	0.2	0.1	–0.1	–0.5	0.4	0.0	0.0
Germany	–0.1	0.0	0.0	–0.7	0.0	0.9	–0.1	–0.1	–0.9	1.0	0.0	–0.1
France	0.0	0.1	0.7	0.3	–0.4	0.2	0.0	0.0	–0.2	0.0	0.0	0.0
Italy	0.0	0.1	0.5	–0.1	0.2	0.2	0.1	–0.5	–0.3	0.3	0.1	0.2
Spain	–0.1	–0.1	0.2	–1.5	–0.1	0.0	0.3	–0.2	–0.5	0.6	–0.1	–0.1
Japan	0.0	0.0	0.1	0.3	–0.1	0.1	0.2	–0.1	–0.1	–0.2	0.0	0.0
United Kingdom	0.1	0.0	0.4	–0.1	–0.2	0.2	–0.5	0.2	–0.7	0.4	–0.1	0.0
Canada	0.1	0.0	–0.4	–0.5	0.0	0.9	–0.1	0.1	–1.3	1.0	0.3	0.0
Other Advanced Economies[1]	0.0	0.0	0.3	–0.1	0.0	0.2	0.3	–0.2	0.0	0.2	–0.3	0.0
Memorandum												
Major Advanced Economies	0.0	0.0	0.1	0.1	–0.3	0.2	0.1	0.0	–0.5	0.3	0.5	–0.1
Foreign Balance[2]												
Advanced Economies	**0.2**	**–0.1**	**0.0**	**–0.3**	**–0.1**	**0.1**	**0.0**	**–0.2**	**–0.1**	**–0.1**	**–0.3**	**0.1**
United States	0.2	–0.4	–0.3	–0.8	–0.2	–0.2	–0.3	–0.2	–0.3	–1.4	–0.4	0.1
Euro Area	0.4	0.0	0.1	–0.2	–0.4	0.4	0.1	–0.8	–0.3	1.3	0.0	–0.2
Germany	0.4	–0.2	0.7	0.3	–0.6	0.2	–0.5	–0.7	–0.8	0.8	–0.5	–0.7
France	–0.1	–0.2	–0.5	–0.4	–0.4	–0.1	0.4	–0.3	–1.1	0.2	–0.2	0.1
Italy	0.4	–0.2	–0.1	–0.4	–0.5	0.0	–0.3	0.7	–0.7	–0.1	–0.5	–0.4
Spain	0.6	0.0	–0.5	–0.1	1.0	–0.2	–0.6	0.5	–2.2	0.5	0.8	0.3
Japan	0.1	0.2	0.1	0.5	0.5	0.6	0.0	–0.5	–0.9	1.1	0.5	0.2
United Kingdom	0.0	–0.3	–1.1	–0.4	–0.1	0.7	–0.1	0.1	1.0	–1.5	–1.7	0.4
Canada	–1.0	–0.1	1.2	0.8	0.4	–1.1	0.2	0.6	0.5	–1.9	–1.9	0.5
Other Advanced Economies[1]	0.6	0.3	0.5	0.0	0.0	–0.2	0.2	0.6	0.8	0.8	0.0	0.3
Memorandum												
Major Advanced Economies	0.1	–0.2	–0.1	–0.3	–0.1	0.0	–0.2	–0.2	–0.4	–0.7	–0.4	0.1

[1]Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.
[2]Changes expressed as percent of GDP in the preceding period.

Table A4. Emerging Market and Developing Economies: Real GDP

(Annual percent change)

	Average									Projections		
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Emerging and Developing Asia	**8.5**	**6.9**	**6.8**	**6.8**	**6.6**	**6.4**	**5.3**	**–0.8**	**7.3**	**5.4**	**5.6**	**5.2**
Bangladesh	6.2	6.1	6.6	7.1	7.3	7.9	8.2	3.5	5.0	6.4	6.7	6.9
Bhutan	7.9	4.0	6.2	7.4	6.3	3.8	4.4	–2.4	–3.7	4.4	4.5	5.8
Brunei Darussalam	0.0	–2.5	–0.4	–2.5	1.3	0.1	3.9	1.1	–0.7	5.8	2.6	2.1
Cambodia	7.9	7.1	7.0	6.9	7.0	7.5	7.1	–3.1	2.2	5.1	5.9	6.5
China	10.3	7.4	7.0	6.9	6.9	6.8	6.0	2.2	8.1	4.4	5.1	4.8
Fiji	1.6	5.6	4.5	2.4	5.4	3.8	–0.4	–15.2	–4.0	6.8	7.7	3.4
India[1]	7.7	7.4	8.0	8.3	6.8	6.5	3.7	–6.6	8.9	8.2	6.9	6.2
Indonesia	5.9	5.0	4.9	5.0	5.1	5.2	5.0	–2.1	3.7	5.4	6.0	5.2
Kiribati	1.4	–1.1	9.9	–0.5	–0.2	5.3	–0.5	–0.5	1.5	1.1	2.8	2.0
Lao P.D.R.	7.8	7.6	7.3	7.0	6.9	6.3	4.7	–0.4	2.1	3.2	3.5	4.3
Malaysia	5.0	6.0	5.0	4.4	5.8	4.8	4.4	–5.6	3.1	5.6	5.5	3.9
Maldives	5.0	7.3	2.9	6.3	7.2	8.1	6.9	–33.5	33.4	6.1	8.9	5.6
Marshall Islands	0.9	–1.0	1.6	1.4	3.3	3.1	6.8	–2.4	–1.5	2.0	3.2	1.6
Micronesia	–0.5	–2.3	4.6	0.9	2.7	0.2	1.2	–1.8	–3.2	–0.5	2.8	0.6
Mongolia	8.6	7.9	2.4	1.5	5.6	7.7	5.6	–4.6	1.4	2.0	7.0	5.0
Myanmar	9.1	8.2	7.5	6.4	5.8	6.4	6.8	3.2	–17.9	1.6	3.0	3.3
Nauru	. . .	27.2	3.4	3.0	–5.5	5.7	1.0	0.7	1.6	0.9	2.0	1.8
Nepal	4.2	6.0	4.0	0.4	9.0	7.6	6.7	–2.1	2.7	4.1	6.1	5.2
Palau	0.0	4.7	8.4	1.1	–3.3	–0.1	–1.9	–9.7	–17.1	8.1	18.8	2.5
Papua New Guinea	4.1	13.5	6.6	5.5	3.5	–0.3	4.5	–3.5	1.7	4.8	4.3	3.0
Philippines	5.4	6.3	6.3	7.1	6.9	6.3	6.1	–9.6	5.6	6.5	6.3	6.5
Samoa	1.7	0.1	4.3	8.1	1.1	–1.2	4.4	–2.6	–8.1	0.0	4.0	2.5
Solomon Islands	5.3	1.0	1.4	5.9	5.3	3.9	1.2	–4.3	–0.2	–4.0	3.2	3.0
Sri Lanka	6.4	5.0	5.0	4.5	3.6	3.3	2.3	–3.6	3.6	2.6	2.7	2.9
Thailand	4.0	1.0	3.1	3.4	4.2	4.2	2.2	–6.2	1.6	3.3	4.3	3.1
Timor-Leste[2]	5.3	4.5	2.8	3.4	–3.1	–0.7	2.1	–8.6	1.8	2.0	3.6	3.0
Tonga	0.1	2.0	1.2	6.6	3.3	0.3	0.7	0.7	–0.7	–1.6	3.0	1.8
Tuvalu	0.8	1.7	9.4	4.7	3.4	1.6	13.9	1.0	2.5	3.0	3.5	3.5
Vanuatu	3.5	3.1	0.4	4.7	6.3	2.9	3.2	–5.4	0.5	2.2	3.4	2.9
Vietnam	6.4	6.4	7.0	6.7	6.9	7.2	7.2	2.9	2.6	6.0	7.2	6.7
Emerging and Developing Europe	**4.3**	**1.8**	**1.0**	**1.9**	**4.1**	**3.4**	**2.5**	**–1.8**	**6.7**	**–2.9**	**1.3**	**2.4**
Albania	4.2	1.8	2.2	3.3	3.8	4.0	2.1	–3.5	8.5	2.0	2.8	3.4
Belarus	6.5	1.7	–3.8	–2.5	2.5	3.1	1.4	–0.7	2.3	–6.4	0.4	0.6
Bosnia and Herzegovina	3.0	1.1	3.1	3.1	3.2	3.7	2.8	–3.1	5.8	2.4	2.3	3.0
Bulgaria	3.3	1.0	3.4	3.0	2.8	2.7	4.0	–4.4	4.2	3.2	4.5	2.8
Croatia	0.8	–0.3	2.5	3.5	3.4	2.9	3.5	–8.1	10.4	2.7	4.0	3.0
Hungary	1.1	4.2	3.8	2.3	4.3	5.4	4.6	–4.7	7.1	3.7	3.6	2.7
Kosovo	4.2	3.3	5.9	5.6	4.8	3.4	4.8	–5.3	9.5	2.8	3.9	3.5
Moldova	4.5	5.0	–0.3	4.4	4.7	4.3	3.7	–8.3	13.9	0.3	2.0	5.0
Montenegro	3.1	1.8	3.4	2.9	4.7	5.1	4.1	–15.3	12.4	3.8	4.2	3.0
North Macedonia	3.4	3.6	3.9	2.8	1.1	2.9	3.9	–6.1	4.0	3.2	2.7	3.5
Poland	4.0	3.4	4.2	3.1	4.8	5.4	4.7	–2.5	5.7	3.7	2.9	3.3
Romania	3.7	3.6	3.0	4.7	7.3	4.5	4.2	–3.7	5.9	2.2	3.4	3.5
Russia	4.2	0.7	–2.0	0.2	1.8	2.8	2.2	–2.7	4.7	–8.5	–2.3	0.7
Serbia	3.8	–1.6	1.8	3.3	2.1	4.5	4.3	–0.9	7.4	3.5	4.0	4.0
Turkey	5.9	4.9	6.1	3.3	7.5	3.0	0.9	1.8	11.0	2.7	3.0	3.3
Ukraine[1]	2.5	–6.6	–9.8	2.4	2.4	3.5	3.2	–3.8	3.4	–35.0	. . .	. . .
Latin America and the Caribbean	**4.0**	**1.3**	**0.4**	**–0.6**	**1.4**	**1.2**	**0.1**	**–7.0**	**6.8**	**2.5**	**2.5**	**2.4**
Antigua and Barbuda	1.3	3.8	3.8	5.5	3.1	6.9	4.9	–20.2	4.8	6.5	5.4	2.7
Argentina	4.9	–2.5	2.7	–2.1	2.8	–2.6	–2.0	–9.9	10.2	4.0	3.0	2.0
Aruba	0.6	0.0	3.6	2.1	5.5	1.3	–2.1	–22.3	16.8	2.7	3.7	1.4
The Bahamas	0.3	2.3	1.6	0.1	1.6	2.8	0.7	–14.5	5.6	6.0	4.1	1.5
Barbados	0.4	–0.1	2.4	2.5	0.5	–0.6	–1.3	–13.7	1.4	11.2	4.9	1.8
Belize	2.4	4.5	2.9	–0.2	2.1	2.0	2.0	–16.7	9.8	5.7	3.4	2.0
Bolivia	4.9	5.5	4.9	4.3	4.2	4.2	2.2	–8.7	6.1	3.8	3.7	3.4
Brazil	4.0	0.5	–3.5	–3.3	1.3	1.8	1.2	–3.9	4.6	0.8	1.4	2.0
Chile	4.6	1.8	2.1	1.8	1.3	4.0	0.8	–6.1	11.7	1.5	0.5	2.5
Colombia	4.8	4.5	3.0	2.1	1.4	2.6	3.2	–7.0	10.6	5.8	3.6	3.4

Table A4. Emerging Market and Developing Economies: Real GDP *(continued)*

(Annual percent change)

	Average									Projections		
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Latin America and the Caribbean (continued)	**4.0**	**1.3**	**0.4**	**–0.6**	**1.4**	**1.2**	**0.1**	**–7.0**	**6.8**	**2.5**	**2.5**	**2.4**
Costa Rica	4.5	3.5	3.7	4.2	4.2	2.6	2.4	–4.1	7.6	3.3	3.1	3.2
Dominica	1.9	4.8	–2.7	2.8	–6.6	3.5	7.5	–11.0	3.7	6.8	5.0	2.5
Dominican Republic	5.1	7.1	6.9	6.7	4.7	7.0	5.1	–6.7	12.3	5.5	5.0	5.0
Ecuador	4.9	3.8	0.1	–1.2	2.4	1.3	0.0	–7.8	4.2	2.9	2.7	2.8
El Salvador	2.1	1.7	2.4	2.5	2.3	2.4	2.6	–7.9	10.3	3.0	2.3	2.0
Grenada	0.9	7.3	6.4	3.7	4.4	4.4	0.7	–13.8	5.6	3.6	3.6	2.8
Guatemala	3.6	4.4	4.1	2.7	3.1	3.3	3.9	–1.5	8.0	4.0	3.6	3.5
Guyana	3.5	1.7	0.7	3.8	3.7	4.4	5.4	43.5	19.9	47.2	34.5	3.7
Haiti	2.0	1.7	2.6	1.8	2.5	1.7	–1.7	–3.3	–1.8	0.3	1.4	1.7
Honduras	4.1	3.1	3.8	3.9	4.8	3.8	2.7	–9.0	12.5	3.8	3.5	3.9
Jamaica	0.2	0.6	0.9	1.5	0.7	1.8	1.0	–10.0	4.4	2.5	3.3	1.6
Mexico	2.2	2.8	3.3	2.6	2.1	2.2	–0.2	–8.2	4.8	2.0	2.5	2.0
Nicaragua	4.0	4.8	4.8	4.6	4.6	–3.4	–3.7	–2.0	10.3	3.8	2.2	3.0
Panama	8.0	5.1	5.7	5.0	5.6	3.7	3.0	–17.9	15.3	7.5	5.0	5.0
Paraguay	4.5	5.3	3.0	4.3	4.8	3.2	–0.4	–0.8	4.2	0.3	4.5	3.5
Peru	6.4	2.4	3.3	4.0	2.5	4.0	2.2	–11.0	13.3	3.0	3.0	3.0
St. Kitts and Nevis	3.1	7.6	0.7	3.9	0.9	2.7	4.8	–14.0	–3.6	10.0	4.7	2.7
St. Lucia	2.0	1.3	–0.2	3.8	3.5	2.9	–0.1	–20.4	6.8	9.7	6.0	1.5
St. Vincent and the Grenadines	1.3	1.1	2.8	4.1	1.7	3.1	0.4	–5.3	–0.5	5.0	6.4	2.7
Suriname	4.7	0.3	–3.4	–4.9	1.6	4.9	1.1	–15.9	–3.5	1.8	2.1	3.0
Trinidad and Tobago	3.4	–0.9	1.8	–6.3	–2.7	–0.7	–0.2	–7.4	–1.0	5.5	3.0	1.0
Uruguay[1]	5.6	3.2	0.4	1.7	1.6	0.5	0.4	–6.1	4.4	3.9	3.0	2.2
Venezuela	. . .	–3.9	–6.2	–17.0	–15.7	–19.6	–35.0	–30.0	–1.5	1.5	1.5	. . .
Middle East and Central Asia	**5.0**	**3.3**	**2.8**	**4.1**	**2.4**	**2.7**	**2.2**	**–2.9**	**5.7**	**4.6**	**3.7**	**3.7**
Afghanistan[1]	8.9	2.7	1.0	2.2	2.6	1.2	3.9	–2.4	. . .	. . .	. . .	. . .
Algeria	3.2	3.8	3.7	3.2	1.4	1.2	0.8	–4.9	4.0	2.4	2.4	1.8
Armenia	5.9	3.6	3.3	0.2	7.5	5.2	7.6	–7.4	5.7	1.5	4.0	4.5
Azerbaijan	12.3	2.8	1.0	–3.1	0.2	1.5	2.5	–4.3	5.6	2.8	2.6	2.5
Bahrain	5.3	4.4	2.5	3.6	4.3	2.1	2.2	–4.9	2.2	3.3	3.0	3.1
Djibouti	4.4	7.1	7.7	6.9	5.1	8.5	6.6	1.0	4.0	3.0	5.0	6.0
Egypt	4.7	2.9	4.4	4.3	4.1	5.3	5.6	3.6	3.3	5.9	5.0	5.9
Georgia	5.9	4.4	3.0	2.9	4.8	4.8	5.0	–6.8	10.4	3.2	5.8	5.2
Iran	2.5	5.0	–1.4	8.8	2.8	–2.3	–1.3	1.8	4.0	3.0	2.0	2.0
Iraq	10.2	0.7	2.5	15.2	–3.4	4.7	5.8	–15.7	5.9	9.5	5.7	2.6
Jordan	5.5	3.4	2.5	2.0	2.1	1.9	2.0	–1.6	2.0	2.4	3.1	3.3
Kazakhstan	6.9	4.3	1.0	0.9	3.9	4.1	4.5	–2.6	4.0	2.3	4.4	3.1
Kuwait	4.3	0.5	0.6	2.9	–4.7	2.4	–0.6	–8.9	1.3	8.2	2.6	2.7
Kyrgyz Republic	4.5	4.0	3.9	4.3	4.7	3.5	4.6	–8.6	3.7	0.9	5.0	4.0
Lebanon[1]	5.3	2.5	0.6	1.6	0.8	–1.7	–7.2	–22.0	. . .	. . .	. . .	. . .
Libya[1]	–6.4	–53.0	–13.0	–7.4	64.0	17.9	13.2	–59.7	177.3	3.5	4.4	3.6
Mauritania	4.3	4.3	5.4	1.3	6.3	4.5	5.8	–1.8	3.0	5.0	4.4	4.6
Morocco	4.6	2.7	4.5	1.1	4.2	3.1	2.6	–6.3	7.2	1.1	4.6	3.4
Oman	4.6	1.4	4.7	4.9	0.3	0.9	–0.8	–2.8	2.0	5.6	2.7	2.5
Pakistan	4.7	4.1	4.1	4.6	4.6	6.1	3.1	–1.0	5.6	4.0	4.2	5.0
Qatar	14.1	5.3	4.8	3.1	–1.5	1.2	0.7	–3.6	1.5	3.4	2.5	3.8
Saudi Arabia	4.5	3.7	4.1	1.7	–0.7	2.5	0.3	–4.1	3.2	7.6	3.6	2.8
Somalia	. . .	2.5	4.4	4.6	2.4	3.8	3.3	–0.3	2.0	3.0	3.6	4.1
Sudan[3]	0.7	4.7	4.9	4.7	0.8	–2.3	–2.5	–3.6	0.5	0.3	3.9	6.0
Syria[4]	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tajikistan	7.3	6.7	6.0	6.9	7.1	7.6	7.4	4.4	9.2	2.5	3.5	4.0
Tunisia[1]	3.7	3.1	1.0	1.1	2.2	2.5	1.5	–9.3	3.1	2.2	. . .	. . .
Turkmenistan	10.4	3.8	3.0	–1.0	4.7	0.9	–3.4	–3.0	4.9	1.6	2.5	1.8
United Arab Emirates	4.3	4.3	5.1	3.1	2.4	1.2	3.4	–6.1	2.3	4.2	3.8	4.2
Uzbekistan	7.7	6.9	7.2	5.9	4.4	5.4	5.7	1.9	7.4	3.4	5.0	5.5
West Bank and Gaza	7.7	–0.2	3.7	8.9	1.4	1.2	1.4	–11.3	6.0	4.0	3.5	2.0
Yemen	2.4	–0.2	–28.0	–9.4	–5.1	0.8	1.4	–8.5	–2.0	1.0	2.5	5.5

Table A4. Emerging Market and Developing Economies: Real GDP *(continued)*

(Annual percent change)

	Average									Projections		
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Sub-Saharan Africa	**5.6**	**5.0**	**3.2**	**1.5**	**3.0**	**3.3**	**3.1**	**–1.7**	**4.5**	**3.8**	**4.0**	**4.4**
Angola	8.4	4.8	0.9	–2.6	–0.2	–2.0	–0.7	–5.6	0.7	3.0	3.3	3.9
Benin	4.0	6.4	1.8	3.3	5.7	6.7	6.9	3.8	6.6	5.9	6.1	6.0
Botswana	3.3	5.7	–4.9	7.2	4.1	4.2	3.0	–8.7	12.5	4.3	4.2	4.0
Burkina Faso	5.9	4.3	3.9	6.0	6.2	6.7	5.7	1.9	6.9	4.7	5.0	5.3
Burundi	4.4	4.2	–3.9	–0.6	0.5	1.6	1.8	0.3	2.4	3.6	4.6	4.5
Cabo Verde	4.1	0.6	1.0	4.7	3.7	4.5	5.7	–14.8	6.9	5.2	5.8	4.5
Cameroon	3.7	5.8	5.6	4.5	3.5	4.0	3.5	0.5	3.5	4.3	4.9	5.2
Central African Republic	–1.5	0.1	4.3	4.7	4.5	3.8	3.0	1.0	1.0	3.5	3.7	4.7
Chad	7.8	6.9	1.8	–5.6	–2.4	2.4	3.4	–2.2	–1.1	3.3	3.5	3.5
Comoros	3.0	2.1	1.3	3.5	4.2	3.6	1.8	–0.3	2.2	3.5	3.7	4.3
Democratic Republic of the Congo	6.3	9.5	6.9	2.4	3.7	5.8	4.4	1.7	5.7	6.4	6.9	6.6
Republic of Congo	4.8	6.7	–3.6	–10.7	–4.4	–4.8	–0.4	–8.1	–0.2	2.4	2.7	3.4
Côte d'Ivoire	2.8	8.8	8.8	7.2	7.4	6.9	6.2	2.0	6.5	6.0	6.7	6.0
Equatorial Guinea	7.6	0.4	–9.1	–8.8	–5.7	–6.2	–6.0	–4.9	–3.5	6.1	–2.9	–1.0
Eritrea	1.8	30.9	–20.6	7.4	–10.0	13.0	3.8	–0.6	2.9	4.7	3.6	3.8
Eswatini	3.8	0.9	2.2	1.1	2.0	2.4	2.6	–1.9	3.1	2.1	1.8	2.3
Ethiopia	10.9	10.3	10.4	8.0	10.2	7.7	9.0	6.1	6.3	3.8	5.7	7.0
Gabon	2.8	4.4	3.9	2.1	0.5	0.8	3.9	–1.9	0.9	2.7	3.4	3.8
The Gambia	2.5	–1.4	4.1	1.9	4.8	7.2	6.2	–0.2	5.6	5.6	6.2	5.0
Ghana	7.3	2.9	2.1	3.4	8.1	6.2	6.5	0.4	4.2	5.2	5.1	7.5
Guinea	3.6	3.7	3.8	10.8	10.3	6.4	5.6	6.4	4.2	4.8	5.8	5.1
Guinea-Bissau	3.5	1.0	6.1	5.3	4.8	3.4	4.5	1.5	3.8	3.8	4.5	5.0
Kenya	4.8	5.0	5.0	4.2	3.8	5.6	5.0	–0.3	7.2	5.7	5.3	5.4
Lesotho	3.6	2.1	3.3	1.9	–2.7	–0.3	0.0	–6.0	2.1	3.1	1.6	0.1
Liberia	7.4	0.7	0.0	–1.6	2.5	1.2	–2.5	–3.0	4.2	4.5	5.5	5.7
Madagascar	3.1	3.3	3.1	4.0	3.9	3.2	4.4	–7.1	3.5	5.1	5.2	5.0
Malawi	5.8	5.7	3.0	2.3	4.0	4.4	5.4	0.9	2.2	2.7	4.3	5.8
Mali	3.6	7.1	6.2	5.9	5.3	4.7	4.8	–1.2	3.1	2.0	5.3	5.0
Mauritius	4.0	3.7	3.6	3.8	3.8	3.8	3.0	–14.9	3.9	6.1	5.6	3.3
Mozambique	7.4	7.4	6.7	3.8	3.7	3.4	2.3	–1.2	2.2	3.8	5.0	13.1
Namibia	4.3	6.1	4.3	0.0	–1.0	1.1	–0.9	–8.5	0.9	2.8	3.7	2.5
Niger	5.3	6.6	4.4	5.7	5.0	7.2	5.9	3.6	1.3	6.9	7.2	6.3
Nigeria	7.3	6.3	2.7	–1.6	0.8	1.9	2.2	–1.8	3.6	3.4	3.1	2.9
Rwanda	8.0	6.2	8.9	6.0	4.0	8.6	9.5	–3.4	10.2	6.4	7.4	6.1
São Tomé and Príncipe	5.3	6.5	3.8	4.2	3.9	3.0	2.2	3.0	1.8	1.6	2.8	4.0
Senegal	3.2	6.2	6.4	6.4	7.4	6.2	4.6	1.3	6.1	5.0	9.2	4.0
Seychelles	4.4	4.7	5.6	5.4	4.5	3.2	3.1	–7.7	8.0	4.6	5.6	4.5
Sierra Leone	7.8	4.6	–20.5	6.4	3.8	3.5	5.3	–2.0	3.2	3.4	4.3	4.3
South Africa	3.3	1.4	1.3	0.7	1.2	1.5	0.1	–6.4	4.9	1.9	1.4	1.4
South Sudan	. . .	2.9	–0.2	–13.5	–5.8	–1.9	0.9	–6.6	5.3	6.5	5.6	4.4
Tanzania	6.5	6.7	6.2	6.9	6.8	7.0	7.0	4.8	4.9	4.8	5.2	6.0
Togo	3.0	5.9	5.7	5.6	4.3	5.0	5.5	1.8	5.1	5.6	6.2	6.5
Uganda	7.1	5.7	8.0	0.2	6.8	5.6	7.7	–1.4	5.1	4.9	6.5	6.8
Zambia	7.6	4.7	2.9	3.8	3.5	4.0	1.4	–2.8	4.3	3.1	3.6	4.8
Zimbabwe[1]	1.7	2.4	1.8	0.5	5.0	4.7	–6.1	–5.3	6.3	3.5	3.0	3.0

[1]See the country-specific notes for Afghanistan, India, Lebanon, Libya, Tunisia, Ukraine, Uruguay, and Zimbabwe in the "Country Notes" section of the Statistical Appendix.
[2]Data for Timor-Leste excludes projections for oil exports from the Joint Petroleum Development Area.
[3]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[4]Data for Syria are excluded for 2011 onward owing to the uncertain political situation.

Table A5. Summary of Inflation

(Percent)

	Average									Projections		
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
GDP Deflators												
Advanced Economies	**1.6**	**1.4**	**1.3**	**1.0**	**1.5**	**1.7**	**1.5**	**1.4**	**2.9**	**4.4**	**2.4**	**1.8**
United States	2.1	1.9	1.0	1.0	1.9	2.4	1.8	1.2	4.2	6.3	3.0	2.0
Euro Area	1.6	0.9	1.4	0.9	1.1	1.5	1.7	1.6	2.0	3.2	2.4	1.9
Japan	–1.0	1.7	2.1	0.4	–0.1	0.0	0.6	0.9	–0.9	0.4	0.4	0.5
Other Advanced Economies[1]	2.0	1.3	1.1	1.2	1.9	1.7	1.2	1.8	3.6	4.4	2.3	2.0
Consumer Prices												
Advanced Economies	**2.0**	**1.4**	**0.3**	**0.7**	**1.7**	**2.0**	**1.4**	**0.7**	**3.1**	**5.7**	**2.5**	**1.9**
United States	2.4	1.6	0.1	1.3	2.1	2.4	1.8	1.2	4.7	7.7	2.9	2.0
Euro Area[2]	2.0	0.4	0.2	0.2	1.5	1.8	1.2	0.3	2.6	5.3	2.3	1.9
Japan	–0.1	2.8	0.8	–0.1	0.5	1.0	0.5	0.0	–0.3	1.0	0.8	1.0
Other Advanced Economies[1]	2.3	1.5	0.5	0.9	1.8	1.9	1.4	0.6	2.5	4.8	3.0	1.9
Emerging Market and Developing Economies[3]	**6.3**	**4.7**	**4.7**	**4.3**	**4.4**	**4.9**	**5.1**	**5.2**	**5.9**	**8.7**	**6.5**	**4.1**
Regional Groups												
Emerging and Developing Asia	5.0	3.4	2.7	2.8	2.4	2.7	3.3	3.1	2.2	3.5	2.9	2.7
Emerging and Developing Europe	8.1	6.5	10.6	5.5	5.6	6.4	6.6	5.3	9.5	27.1	18.1	6.8
Latin America and the Caribbean	4.9	4.9	5.4	5.5	6.3	6.6	7.7	6.4	9.8	11.2	8.0	5.0
Middle East and Central Asia	8.4	6.5	5.6	5.7	6.9	9.8	7.8	10.6	13.2	12.8	10.5	6.9
Sub-Saharan Africa	8.6	6.4	6.7	10.3	10.6	8.3	8.1	10.2	11.0	12.2	9.6	6.7
Analytical Groups												
By Source of Export Earnings												
Fuel	8.4	5.6	5.6	7.6	6.4	8.8	7.1	9.5	12.1	11.5	9.2	7.6
Nonfuel	5.9	4.6	4.6	3.9	4.2	4.5	4.9	4.7	5.2	8.4	6.2	3.8
Of Which, Primary Products[4]	6.6	7.4	5.7	6.6	11.5	13.7	16.8	18.3	22.0	22.5	16.8	8.3
By External Financing Source												
Net Debtor Economies	7.2	5.8	5.7	5.5	5.8	5.8	5.6	6.1	7.7	11.2	8.1	4.8
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2016–20	10.1	9.3	14.0	11.5	17.6	16.6	13.4	16.4	21.1	22.4	17.1	7.0
Other Groups												
European Union	2.3	0.4	0.1	0.2	1.6	1.8	1.4	0.7	2.9	5.8	2.9	2.0
Middle East and North Africa	8.2	6.4	5.7	5.5	7.0	11.1	8.2	11.2	14.6	13.4	10.8	7.3
Emerging Market and Middle-Income Economies	6.0	4.5	4.6	4.0	4.0	4.6	4.9	4.6	5.3	8.2	6.2	4.0
Low-Income Developing Countries	9.8	7.2	6.5	8.4	9.2	8.8	8.3	11.4	13.3	13.9	10.4	6.1
Memorandum												
Median Inflation Rate												
Advanced Economies	2.3	0.7	0.1	0.5	1.6	1.8	1.4	0.4	2.5	5.0	2.3	2.0
Emerging Market and Developing Economies[3]	5.2	3.1	2.5	2.7	3.3	3.1	2.7	2.8	3.9	6.1	4.3	3.0

[1]Excludes the United States, euro area countries, and Japan.
[2]Based on Eurostat's harmonized index of consumer prices.
[3]Excludes 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.
[4]Includes 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 Prices[1]

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027	2021	2022	2023
Advanced Economies	**2.0**	**1.4**	**0.3**	**0.7**	**1.7**	**2.0**	**1.4**	**0.7**	**3.1**	**5.7**	**2.5**	**1.9**	**5.3**	**4.4**	**2.2**
United States	2.4	1.6	0.1	1.3	2.1	2.4	1.8	1.2	4.7	7.7	2.9	2.0	7.4	5.3	2.3
Euro Area[3]	2.0	0.4	0.2	0.2	1.5	1.8	1.2	0.3	2.6	5.3	2.3	1.9	5.0	4.2	2.1
Germany	1.8	0.8	0.7	0.4	1.7	1.9	1.4	0.4	3.2	5.5	2.9	2.0	5.7	4.7	2.5
France	1.8	0.6	0.1	0.3	1.2	2.1	1.3	0.5	2.1	4.1	1.8	1.6	3.3	3.4	1.8
Italy	2.2	0.2	0.1	–0.1	1.3	1.2	0.6	–0.1	1.9	5.3	2.5	2.0	4.2	5.3	2.5
Spain	2.5	–0.2	–0.5	–0.2	2.0	1.7	0.7	–0.3	3.1	5.3	1.3	1.7	6.5	2.7	0.8
The Netherlands	1.8	0.3	0.2	0.1	1.3	1.6	2.7	1.1	2.8	5.2	2.3	2.0	6.3	3.0	2.4
Belgium	2.3	0.5	0.6	1.8	2.2	2.3	1.2	0.4	3.2	8.0	1.3	1.7	6.6	4.4	1.6
Ireland	1.3	0.3	–0.1	–0.2	0.3	0.7	0.9	–0.5	2.4	5.7	2.7	2.0	5.6	5.7	2.7
Austria	2.1	1.5	0.8	1.0	2.2	2.1	1.5	1.4	2.8	5.6	2.2	2.0	3.8	4.3	2.0
Portugal	2.0	–0.2	0.5	0.6	1.6	1.2	0.3	–0.1	0.9	4.0	1.5	1.3	0.0	6.1	1.2
Greece	2.6	–1.4	–1.1	0.0	1.1	0.8	0.5	–1.3	0.6	4.5	1.3	1.9	4.4	2.4	1.5
Finland	2.0	1.2	–0.2	0.4	0.8	1.2	1.1	0.4	2.1	3.8	2.7	1.8	3.2	3.3	2.7
Slovak Republic	3.1	–0.1	–0.3	–0.5	1.4	2.5	2.8	2.0	2.8	8.4	4.1	2.0	5.0	8.1	2.8
Lithuania	3.8	0.2	–0.7	0.7	3.7	2.5	2.2	1.1	4.6	13.3	4.3	2.3	10.7	9.3	3.6
Slovenia	2.7	0.2	–0.5	–0.1	1.4	1.7	1.6	–0.1	1.9	6.7	5.1	2.4	4.9	5.8	4.2
Luxembourg	2.8	0.7	0.1	0.0	2.1	2.0	1.7	0.0	3.5	5.6	2.0	2.0	5.4	3.5	2.0
Latvia	5.3	0.7	0.2	0.1	2.9	2.6	2.7	0.1	3.2	10.0	3.9	2.5	7.9	8.1	3.2
Estonia	4.4	0.5	0.1	0.8	3.7	3.4	2.3	–0.6	4.5	11.9	4.6	2.3	12.0	7.8	2.6
Cyprus	2.2	–0.3	–1.5	–1.2	0.7	0.8	0.5	–1.1	2.2	5.3	2.3	1.9	4.7	3.0	2.5
Malta	2.4	0.8	1.2	0.9	1.3	1.7	1.5	0.8	0.7	4.7	2.8	2.0	2.6	4.6	2.1
Japan	–0.1	2.8	0.8	–0.1	0.5	1.0	0.5	0.0	–0.3	1.0	0.8	1.0	0.4	1.1	0.9
United Kingdom	2.7	1.5	0.0	0.7	2.7	2.5	1.8	0.9	2.6	7.4	5.3	2.0	5.4	7.6	3.5
Korea	2.9	1.3	0.7	1.0	1.9	1.5	0.4	0.5	2.5	4.0	2.4	2.0	3.7	3.6	2.0
Canada	1.8	1.9	1.1	1.4	1.6	2.3	1.9	0.7	3.4	5.6	2.4	2.0	4.7	4.6	2.2
Taiwan Province of China	1.4	1.3	–0.6	1.0	1.1	1.5	0.5	–0.2	1.8	2.3	2.2	1.4	2.6	2.3	2.2
Australia	2.7	2.5	1.5	1.3	2.0	1.9	1.6	0.9	2.8	3.9	2.7	2.5	3.7	3.3	2.5
Switzerland	0.6	0.0	–1.1	–0.4	0.5	0.9	0.4	–0.7	0.6	2.5	1.6	1.0	1.5	2.4	1.7
Sweden	1.5	0.2	0.7	1.1	1.9	2.0	1.7	0.7	2.7	4.8	2.2	2.0	3.9	4.3	2.2
Singapore	2.7	1.0	–0.5	–0.5	0.6	0.4	0.6	–0.2	2.3	3.5	2.0	1.5	4.0	2.3	2.0
Hong Kong SAR	2.5	4.4	3.0	2.4	1.5	2.4	2.9	0.3	1.6	1.9	2.1	2.5	2.4	1.9	2.2
Czech Republic	2.5	0.3	0.3	0.7	2.5	2.1	2.8	3.2	3.8	9.0	2.3	2.0	6.6	6.0	2.0
Israel	2.1	0.5	–0.6	–0.5	0.2	0.8	0.8	–0.6	1.5	3.5	2.0	1.8	2.8	3.1	2.1
Norway	1.7	2.0	2.2	3.6	1.9	2.8	2.2	1.3	3.5	3.5	1.8	2.0	5.3	2.3	2.0
Denmark	1.9	0.4	0.2	0.0	1.1	0.7	0.7	0.3	1.9	3.8	2.1	2.0	3.4	3.8	2.1
New Zealand	2.6	1.2	0.3	0.6	1.9	1.6	1.6	1.7	3.9	5.9	3.5	2.0	5.9	4.2	3.1
Puerto Rico	3.1	0.6	–0.8	–0.3	1.8	1.3	0.1	–0.5	2.3	4.4	3.3	1.8	4.1	4.7	1.9
Macao SAR	4.6	6.0	4.6	2.4	1.2	3.0	2.8	0.8	0.0	2.8	2.7	2.5	1.0	2.8	2.7
Iceland	6.2	2.0	1.6	1.7	1.8	2.7	3.0	2.9	4.5	6.9	5.5	2.5	5.1	7.4	4.7
Andorra	2.2	–0.1	–1.1	–0.4	2.6	1.3	0.7	0.3	1.7	2.9	1.3	1.7	3.3	1.8	0.9
San Marino	2.3	1.1	0.1	0.6	1.0	1.8	1.0	0.2	2.1	4.9	2.0	1.7	2.1	4.9	2.0
Memorandum															
Major Advanced Economies	1.9	1.5	0.3	0.8	1.8	2.1	1.5	0.8	3.3	6.1	2.7	1.8	5.6	4.7	2.2

[1]Movements in consumer prices are shown as annual averages.
[2]Monthly year-over-year changes and, for several countries, on a quarterly basis.
[3]Based on Eurostat's harmonized index of consumer prices.

Table A7. Emerging Market and Developing Economies: Consumer Prices[1]

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027	2021	2022	2023
Emerging and Developing Asia	**5.0**	**3.4**	**2.7**	**2.8**	**2.4**	**2.7**	**3.3**	**3.1**	**2.2**	**3.5**	**2.9**	**2.7**	**3.0**	**3.7**	**2.5**
Bangladesh	8.2	7.3	6.4	5.9	5.4	5.8	5.5	5.6	5.6	6.0	6.2	5.5	5.6	6.4	5.9
Bhutan	6.3	9.6	6.7	3.3	4.3	3.7	2.8	4.2	8.1	7.9	5.4	4.0	9.0	6.5	5.1
Brunei Darussalam	0.7	–0.2	–0.3	–0.4	–1.3	1.1	–0.4	1.9	1.5	2.0	1.5	1.0	0.7	0.7	0.5
Cambodia	6.2	3.9	1.2	3.0	2.9	2.4	2.0	2.9	3.0	3.0	3.0	3.0	4.1	3.0	3.0
China	3.1	2.0	1.4	2.0	1.6	2.1	2.9	2.4	0.9	2.1	1.8	2.0	1.8	2.5	1.4
Fiji	4.1	0.5	1.4	3.9	3.3	4.1	1.8	–2.6	0.2	4.0	3.0	2.5	3.0	4.5	3.2
India	8.2	5.8	4.9	4.5	3.6	3.4	4.8	6.2	5.5	6.1	4.8	4.0	6.1	5.7	4.5
Indonesia	7.1	6.4	6.4	3.5	3.8	3.3	2.8	2.0	1.6	3.3	3.3	2.9	1.9	4.0	3.1
Kiribati	1.7	2.1	0.6	1.9	0.4	0.6	–1.8	2.5	3.0	5.0	3.3	1.6	3.2	4.8	3.1
Lao P.D.R.	6.0	4.1	1.3	1.6	0.8	2.0	3.3	5.1	3.8	6.2	5.0	3.0	5.3	6.2	5.0
Malaysia	2.5	3.1	2.1	2.1	3.8	1.0	0.7	–1.1	2.5	3.0	2.4	2.5	3.2	3.0	2.4
Maldives	6.7	2.4	1.4	0.8	2.3	1.4	1.3	–1.6	0.2	2.3	2.0	2.0	0.2	2.3	2.0
Marshall Islands	4.1	1.1	–2.2	–1.5	0.1	0.8	–0.5	–0.2	3.5	5.3	3.0	2.0	3.5	5.3	3.0
Micronesia	4.4	0.7	0.0	–0.9	0.1	1.1	2.2	0.9	2.1	5.6	3.0	2.1	2.1	5.6	3.0
Mongolia	11.2	12.3	5.7	0.7	4.3	6.8	7.3	3.7	7.1	15.5	14.5	6.5	13.5	17.5	11.5
Myanmar	10.6	5.7	7.3	9.1	4.6	5.9	8.6	5.7	3.6	14.1	8.2	7.8	7.3	14.7	8.3
Nauru	. . .	0.3	9.8	8.2	5.1	0.5	4.3	–6.6	1.2	2.0	2.0	2.0	1.2	2.6	1.7
Nepal	7.9	9.0	7.2	9.9	4.5	4.1	4.6	6.1	3.6	5.8	5.8	5.4	4.2	6.9	5.7
Palau	3.8	4.0	2.2	–1.3	1.1	2.0	0.6	0.7	0.4	5.0	2.3	1.0	0.4	5.0	2.3
Papua New Guinea	4.4	5.2	6.0	6.7	5.4	4.7	3.7	4.9	4.5	6.4	5.4	4.5	5.7	6.0	5.2
Philippines	4.6	3.6	0.7	1.2	2.9	5.3	2.4	2.4	3.9	4.3	3.7	3.0	3.1	4.0	3.4
Samoa	5.2	–1.2	1.9	0.1	1.3	3.7	2.2	1.5	–3.0	8.3	4.8	3.0	4.1	6.6	3.0
Solomon Islands	7.7	5.3	–0.6	0.5	0.5	3.5	1.6	3.0	–0.1	5.4	3.2	3.6	3.5	4.5	3.0
Sri Lanka	8.6	2.8	2.2	4.0	6.6	4.3	4.3	4.6	6.0	17.6	12.9	5.0	12.1	17.2	9.5
Thailand	3.1	1.9	–0.9	0.2	0.7	1.1	0.7	–0.8	1.2	3.5	2.8	2.0	2.2	4.0	0.8
Timor-Leste	6.3	0.8	0.6	–1.5	0.5	2.3	0.9	0.5	3.8	6.0	4.0	2.0	5.3	6.0	4.0
Tonga	6.0	2.3	0.1	–0.6	7.2	6.8	3.3	0.4	1.4	6.1	4.3	2.7	6.9	5.1	3.5
Tuvalu	2.4	1.1	3.1	3.5	4.1	2.2	3.5	1.6	3.0	4.4	3.1	2.9	3.0	4.4	3.1
Vanuatu	2.4	0.8	2.5	0.8	3.1	2.4	2.7	5.3	3.0	4.8	3.9	2.9	3.2	5.0	3.1
Vietnam	10.4	4.1	0.6	2.7	3.5	3.5	2.8	3.2	1.9	3.8	3.2	3.5	1.9	3.8	3.2
Emerging and Developing Europe	**8.1**	**6.5**	**10.6**	**5.5**	**5.6**	**6.4**	**6.6**	**5.3**	**9.5**	**27.1**	**18.1**	**6.8**	**15.0**	**26.0**	**14.7**
Albania	2.7	1.6	1.9	1.3	2.0	2.0	1.4	1.6	2.0	5.5	3.7	3.0	3.7	4.8	3.0
Belarus	19.8	18.1	13.5	11.8	6.0	4.9	5.6	5.5	9.5	12.6	14.1	5.0	10.0	15.9	12.4
Bosnia and Herzegovina	2.6	–0.9	–1.0	–1.6	0.8	1.4	0.6	–1.1	2.0	6.5	3.0	2.0	1.8	5.9	2.7
Bulgaria[3]	5.0	–1.6	–1.1	–1.3	1.2	2.6	2.5	1.2	2.8	11.0	3.3	2.0	6.6	11.0	0.4
Croatia	2.9	–0.2	–0.5	–1.1	1.1	1.5	0.8	0.1	2.6	5.9	2.7	1.9	5.5	5.8	2.1
Hungary	4.8	–0.2	–0.1	0.4	2.4	2.8	3.4	3.3	5.1	10.3	6.4	3.0	7.4	10.7	4.5
Kosovo	2.4	0.4	–0.5	0.2	1.5	1.1	2.7	0.2	3.3	9.5	3.3	2.0	6.7	8.4	2.1
Moldova	8.5	5.1	9.6	6.4	6.5	3.6	4.8	3.8	5.1	21.9	6.5	5.0	13.9	15.7	5.0
Montenegro	3.5	–0.7	1.5	–0.3	2.4	2.6	0.4	–0.2	2.4	6.8	3.8	1.8	4.7	7.0	2.8
North Macedonia	2.4	–0.3	–0.3	–0.2	1.4	1.5	0.8	1.2	3.2	6.9	3.6	2.0	4.9	5.2	3.3
Poland	2.8	0.0	–0.9	–0.6	2.0	1.6	2.3	3.4	5.1	8.9	10.3	2.5	8.6	8.1	7.9
Romania	6.5	1.1	–0.6	–1.6	1.3	4.6	3.8	2.6	5.0	9.3	4.0	2.5	8.2	7.6	3.4
Russia	9.5	7.8	15.5	7.0	3.7	2.9	4.5	3.4	6.7	21.3	14.3	4.0	8.4	24.0	12.0
Serbia	9.6	2.1	1.4	1.1	3.1	2.0	1.9	1.6	4.1	7.7	4.7	3.0	7.9	6.0	4.0
Turkey	8.3	8.9	7.7	7.8	11.1	16.3	15.2	12.3	19.6	60.5	37.2	15.0	36.1	52.4	29.7
Ukraine[4]	10.1	12.1	48.7	13.9	14.4	10.9	7.9	2.7	9.4	. . .	. . .	. . .	10.0	. . .	. . .
Latin America and the Caribbean[5]	**4.9**	**4.9**	**5.4**	**5.5**	**6.3**	**6.6**	**7.7**	**6.4**	**9.8**	**11.2**	**8.0**	**5.0**	**11.6**	**10.0**	**7.1**
Antigua and Barbuda	2.3	1.1	1.0	–0.5	2.4	1.2	1.4	1.1	1.6	4.4	3.5	2.0	1.2	5.4	2.4
Argentina[4]	8.9	. . .	. . .	. . .	25.7	34.3	53.5	42.0	48.4	51.7	43.5	24.2	50.9	48.0	42.0
Aruba	2.6	0.4	0.5	–0.9	–1.0	3.6	3.9	–1.3	0.7	4.6	2.4	1.3	3.6	4.0	1.4
The Bahamas	2.0	1.2	1.9	–0.3	1.5	2.3	2.5	0.0	3.2	7.3	4.5	2.4	5.5	6.7	3.5
Barbados	5.2	1.8	–1.1	1.5	4.4	3.7	4.1	2.9	3.0	6.0	4.5	2.3	5.0	4.3	3.5
Belize	2.3	1.2	–0.9	0.7	1.1	0.3	0.2	0.1	3.2	4.8	3.7	2.0	4.9	5.2	2.5
Bolivia	6.0	5.8	4.1	3.6	2.8	2.3	1.8	0.9	0.7	3.2	3.6	3.5	0.9	4.2	3.6
Brazil	5.5	6.3	9.0	8.7	3.4	3.7	3.7	3.2	8.3	8.2	5.1	3.0	10.1	6.7	3.5
Chile	3.1	4.7	4.3	3.8	2.2	2.3	2.3	3.0	4.5	7.5	4.5	3.0	7.1	6.0	3.9
Colombia	4.3	2.9	5.0	7.5	4.3	3.2	3.5	2.5	3.5	7.7	4.2	3.0	5.6	6.9	3.8

Table A7. Emerging Market and Developing Economies: Consumer Prices[1] *(continued)*

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027	2021	2022	2023
Latin America and the Caribbean (continued)[5]	**4.9**	**4.9**	**5.4**	**5.5**	**6.3**	**6.6**	**7.7**	**6.4**	**9.8**	**11.2**	**8.0**	**5.0**	**11.6**	**10.0**	**7.1**
Costa Rica	8.8	4.5	0.8	0.0	1.6	2.2	2.1	0.7	1.7	5.4	3.7	3.0	3.3	5.2	3.4
Dominica	2.1	0.8	–0.9	0.1	0.3	1.0	1.5	–0.7	0.5	5.0	4.2	2.0	0.5	5.0	4.2
Dominican Republic	9.7	3.0	0.8	1.6	3.3	3.6	1.8	3.8	8.2	8.4	5.0	4.0	8.5	6.9	4.5
Ecuador	4.0	3.6	4.0	1.7	0.4	–0.2	0.3	–0.3	0.1	3.2	2.4	1.0	1.9	3.8	1.4
El Salvador	3.4	1.1	–0.7	0.6	1.0	1.1	0.1	–0.4	3.5	5.2	2.2	1.3	6.1	5.0	2.0
Grenada	3.0	–1.0	–0.6	1.7	0.9	0.8	0.6	–0.7	1.2	4.4	3.5	2.0	1.9	5.4	2.3
Guatemala	6.1	3.4	2.4	4.4	4.4	3.8	3.7	3.2	4.3	4.4	4.3	4.0	3.1	4.8	4.5
Guyana	5.4	0.7	–0.9	0.8	1.9	1.3	2.1	0.7	5.1	5.4	6.2	3.1	5.7	7.4	5.0
Haiti	9.5	3.2	5.3	11.4	10.6	11.4	17.3	22.9	15.9	25.5	14.3	9.4	13.1	24.9	12.0
Honduras	6.8	6.1	3.2	2.7	3.9	4.3	4.4	3.5	4.5	6.0	5.0	4.0	5.3	6.0	4.0
Jamaica	11.4	8.3	3.7	2.3	4.4	3.7	3.9	5.2	5.9	8.5	5.9	5.0	7.3	8.0	4.0
Mexico	4.2	4.0	2.7	2.8	6.0	4.9	3.6	3.4	5.7	6.8	3.9	3.0	7.4	5.9	3.4
Nicaragua	8.9	6.0	4.0	3.5	3.9	4.9	5.4	3.7	4.9	8.7	6.2	3.5	7.2	8.5	4.5
Panama	4.0	2.6	0.1	0.7	0.9	0.8	–0.4	–1.6	1.6	3.1	3.4	2.0	2.6	4.0	3.0
Paraguay	6.1	5.0	3.1	4.1	3.6	4.0	2.8	1.8	4.8	9.4	4.5	4.0	6.8	7.0	4.2
Peru	2.9	3.2	3.5	3.6	2.8	1.3	2.1	1.8	4.0	5.5	3.6	2.0	6.4	4.0	3.0
St. Kitts and Nevis	3.4	0.2	–2.3	–0.7	0.7	–1.0	–0.3	–0.6	0.2	4.2	3.9	2.0	1.9	6.6	1.3
St. Lucia	2.9	3.5	–1.0	–3.1	0.1	2.6	0.5	–1.8	2.4	6.4	2.7	2.0	4.1	5.4	2.3
St. Vincent and the Grenadines	3.4	0.2	–1.7	–0.2	2.2	2.3	0.9	–0.6	1.6	6.0	4.4	2.0	3.4	8.0	2.1
Suriname	8.5	3.4	6.9	55.5	22.0	6.9	4.4	34.9	59.1	38.9	22.6	4.9	60.6	25.8	17.6
Trinidad and Tobago	7.6	5.7	4.7	3.1	1.9	1.0	1.0	0.6	1.1	4.6	3.8	1.9	3.5	5.5	3.1
Uruguay	7.5	8.9	8.7	9.6	6.2	7.6	7.9	9.8	7.7	7.0	5.6	4.5	8.0	6.0	5.0
Venezuela[4]	24.1	62.2	121.7	254.9	438.1	65,374.1	19,906.0	2,355.1	1,588.5	500.0	500.0	. . .	686.4	500.0	500.0
Middle East and Central Asia	**8.4**	**6.5**	**5.6**	**5.7**	**6.9**	**9.8**	**7.8**	**10.6**	**13.2**	**12.8**	**10.5**	**6.9**	**13.0**	**12.5**	**9.0**
Afghanistan[4]	8.7	4.7	–0.7	4.4	5.0	0.6	2.3	5.6	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Algeria	4.2	2.9	4.8	6.4	5.6	4.3	2.0	2.4	7.2	8.7	8.2	9.3	8.5	9.5	7.7
Armenia	5.1	3.0	3.7	–1.4	1.2	2.5	1.4	1.2	7.2	7.6	6.0	4.0	7.7	7.5	5.0
Azerbaijan	7.8	1.4	4.0	12.4	12.8	2.3	2.7	2.8	6.7	12.3	8.7	4.0	12.0	11.0	6.0
Bahrain	2.4	2.6	1.8	2.8	1.4	2.1	1.0	–2.3	–0.6	3.5	2.8	2.0	–0.4	3.0	2.3
Djibouti	4.2	1.3	–0.8	2.7	0.6	0.1	3.3	1.8	1.2	3.8	4.2	2.5	2.5	5.0	3.5
Egypt	9.8	10.1	11.0	10.2	23.5	20.9	13.9	5.7	4.5	7.5	11.0	7.4	4.9	10.7	8.6
Georgia	5.7	3.1	4.0	2.1	6.0	2.6	4.9	5.2	9.6	9.9	5.1	3.0	13.9	7.6	3.4
Iran	18.8	15.6	11.9	9.1	9.6	30.2	34.6	36.4	40.1	32.3	27.5	25.0	34.7	30.0	25.0
Iraq	. . .	2.2	1.4	0.5	0.2	0.4	–0.2	0.6	6.0	6.9	4.7	2.0	5.3	5.9	3.9
Jordan	4.7	3.0	–1.1	–0.6	3.6	4.5	0.7	0.4	1.3	2.8	2.5	2.5	2.3	2.8	2.5
Kazakhstan	8.4	6.7	6.7	14.6	7.4	6.0	5.2	6.8	8.0	8.5	7.1	4.0	8.4	8.5	6.0
Kuwait	4.0	3.1	3.7	3.5	1.5	0.6	1.1	2.1	3.4	4.8	2.3	2.5	4.1	3.4	2.8
Kyrgyz Republic	8.8	7.5	6.5	0.4	3.2	1.5	1.1	6.3	11.9	13.2	10.1	4.8	11.2	14.7	6.4
Lebanon[4]	4.1	1.1	–3.8	–0.8	4.5	6.1	2.9	84.9	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Libya[4]	5.1	2.4	14.8	24.0	28.0	–1.2	0.2	2.8	3.7	3.7	2.4	2.7	3.7	3.7	2.4
Mauritania	6.6	3.8	0.5	1.5	2.3	3.1	2.3	2.3	3.8	4.9	4.0	4.0	5.7	4.0	4.0
Morocco	1.8	0.4	1.4	1.5	0.7	1.6	0.2	0.6	1.4	4.4	2.3	2.0	3.2	4.0	2.2
Oman	3.9	1.0	0.1	1.1	1.6	0.9	0.1	–0.9	1.5	3.7	2.2	1.9	1.5	3.7	2.2
Pakistan	10.3	8.6	4.5	2.9	4.1	3.9	6.7	10.7	8.9	11.2	10.5	6.5	9.7	12.7	8.2
Qatar	5.4	4.2	0.9	2.7	0.4	0.3	–0.7	–2.7	2.3	3.5	3.2	1.5	5.9	1.2	5.2
Saudi Arabia	3.2	2.2	1.2	2.1	–0.8	2.5	–2.1	3.4	3.1	2.5	2.0	2.0	1.2	2.5	2.0
Somalia	. . .	1.3	0.9	0.0	4.0	4.3	4.5	4.3	4.6	9.4	3.6	3.3	5.7	8.7	3.5
Sudan[6]	16.5	36.9	16.9	17.8	32.4	63.3	51.0	163.3	359.1	245.1	111.4	8.1	318.2	244.4	69.2
Syria[7]	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tajikistan	9.3	6.1	5.8	5.9	7.3	3.8	7.8	8.6	8.7	10.0	10.5	6.5	8.0	12.0	9.0
Tunisia[4]	3.9	4.6	4.4	3.6	5.3	7.3	6.7	5.6	5.7	7.7	. . .	. . .	6.6	8.4	. . .
Turkmenistan	6.4	6.0	7.4	3.6	8.0	13.3	5.1	7.6	15.0	17.5	10.5	8.0	21.0	14.0	7.0
United Arab Emirates	4.8	2.3	4.1	1.6	2.0	3.1	–1.9	–2.1	0.2	3.7	2.8	2.0	0.2	3.7	2.8
Uzbekistan	11.6	9.1	8.5	8.8	13.9	17.5	14.5	12.9	10.8	11.8	11.3	5.1	10.0	12.1	11.3
West Bank and Gaza	3.8	1.7	1.4	–0.2	0.2	–0.2	1.6	–0.7	1.2	2.8	2.4	2.0	1.3	2.6	2.3
Yemen	11.4	8.2	22.0	21.3	30.4	27.6	12.0	23.1	63.8	59.7	34.0	10.8	85.1	46.0	25.8

Table A7. Emerging Market and Developing Economies: Consumer Prices[1] *(continued)*

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027	2021	2022	2023
Sub-Saharan Africa	**8.6**	**6.4**	**6.7**	**10.3**	**10.6**	**8.3**	**8.1**	**10.2**	**11.0**	**12.2**	**9.6**	**6.7**	**11.5**	**11.6**	**8.9**
Angola	16.2	7.3	9.2	30.7	29.8	19.6	17.1	22.3	25.8	23.9	13.2	6.4	27.0	18.0	12.0
Benin	3.3	–1.1	0.2	–0.8	1.8	0.8	–0.9	3.0	1.7	4.6	1.8	2.0	1.7	4.6	1.8
Botswana	8.4	4.4	3.1	2.8	3.3	3.2	2.7	1.9	6.7	8.9	4.5	4.5	8.7	8.9	4.5
Burkina Faso	2.6	–0.3	1.7	0.4	1.5	2.0	–3.2	1.9	3.9	6.0	2.0	2.0	8.0	4.0	2.0
Burundi	10.8	4.4	5.6	5.5	1.6	–4.0	–0.7	7.3	8.3	9.2	6.5	6.0	10.1	7.1	6.0
Cabo Verde	2.6	–0.2	0.1	–1.4	0.8	1.3	1.1	0.6	1.9	2.3	2.0	2.0	5.4	2.5	2.0
Cameroon	2.5	1.9	2.7	0.9	0.6	1.1	2.5	2.5	2.3	2.9	2.3	2.0	2.1	2.7	2.0
Central African Republic	3.3	17.8	1.4	4.9	4.2	1.6	2.8	0.9	4.3	4.0	3.6	2.5	2.7	5.4	2.4
Chad	2.6	1.7	4.8	–1.6	–0.9	4.0	–1.0	4.5	–0.8	4.1	3.1	3.0	1.0	3.8	3.1
Comoros	3.7	0.0	0.9	0.8	0.1	1.7	3.7	0.8	1.5	5.0	1.5	1.9	11.3	0.2	1.1
Democratic Republic of the Congo	15.3	1.2	0.7	3.2	35.7	29.3	4.7	11.4	9.0	6.4	6.1	6.3	5.3	6.4	5.8
Republic of Congo	3.5	0.9	3.2	3.2	0.4	1.2	0.4	1.4	2.0	2.7	3.0	3.0	1.5	3.0	3.0
Côte d'Ivoire	2.2	0.5	1.2	0.6	0.6	0.6	0.8	2.4	4.2	5.5	2.3	2.0	5.6	4.2	1.7
Equatorial Guinea	4.4	4.3	1.7	1.4	0.7	1.3	1.2	4.8	–0.1	4.0	3.9	3.0	2.9	4.9	3.0
Eritrea	14.1	10.0	28.5	–5.6	–13.3	–14.4	–16.4	4.8	4.5	6.2	3.5	2.0	4.0	4.0	2.0
Eswatini	6.7	5.7	5.0	7.8	6.2	4.8	2.6	3.9	3.7	4.8	4.2	4.4	3.5	4.8	4.2
Ethiopia	16.6	7.4	9.6	6.6	10.7	13.8	15.8	20.4	26.8	34.5	30.5	12.4	35.1	33.4	28.1
Gabon	1.2	4.5	–0.1	2.1	2.7	4.8	2.0	1.3	1.1	2.9	2.6	2.0	1.7	3.6	1.7
The Gambia	5.5	6.3	6.8	7.2	8.0	6.5	7.1	5.9	7.4	8.0	8.0	5.0	7.6	8.5	7.5
Ghana	11.2	15.5	17.2	17.5	12.4	9.8	7.1	9.9	10.0	16.3	13.0	6.0	12.6	15.8	10.3
Guinea	19.0	9.7	8.2	8.2	8.9	9.8	9.5	10.6	12.6	12.7	12.3	7.8	12.5	12.8	11.8
Guinea-Bissau	2.8	–1.0	1.5	2.7	–0.2	0.4	0.3	1.5	3.3	4.0	3.0	2.0	5.8	0.7	3.0
Kenya	8.5	6.9	6.6	6.3	8.0	4.7	5.2	5.3	6.1	7.2	7.1	5.0	5.7	8.7	5.5
Lesotho	6.0	5.4	3.2	6.6	4.4	4.8	5.2	5.0	6.0	6.1	5.6	5.5	5.9	6.0	4.9
Liberia	8.6	9.9	7.7	8.8	12.4	23.5	27.0	17.0	7.8	8.2	6.9	5.0	5.5	10.7	8.2
Madagascar	10.1	6.1	7.4	6.1	8.6	8.6	5.6	4.2	5.8	8.8	6.8	5.8	6.2	8.3	6.6
Malawi	11.3	23.8	21.9	21.7	11.5	9.2	9.4	8.6	9.3	10.7	7.1	5.0	11.5	10.7	6.6
Mali	2.4	2.7	1.4	–1.8	1.8	1.7	–2.9	0.5	4.0	8.0	3.0	2.0	8.9	4.0	3.0
Mauritius	5.6	3.2	1.3	1.0	3.7	3.2	0.5	2.5	4.0	8.4	5.7	3.5	6.8	8.0	5.6
Mozambique	9.1	2.6	3.6	17.4	15.1	3.9	2.8	3.1	5.7	8.5	7.7	5.5	6.7	9.0	7.0
Namibia	5.8	5.3	3.4	6.7	6.1	4.3	3.7	2.2	3.6	5.5	4.6	4.5	4.5	6.0	4.5
Niger	2.6	–0.9	1.0	0.2	0.2	2.8	–2.5	2.9	3.8	5.0	3.0	2.0	4.9	5.0	3.0
Nigeria	11.5	8.0	9.0	15.7	16.5	12.1	11.4	13.2	17.0	16.1	13.1	11.5	15.6	15.6	12.4
Rwanda	8.3	1.8	2.5	5.7	4.8	1.4	2.4	7.7	0.8	8.0	7.0	5.0	1.9	7.5	6.8
São Tomé and Príncipe	16.6	7.0	6.1	5.4	5.7	7.9	7.7	9.8	8.1	14.5	9.2	5.0	9.5	15.0	5.0
Senegal	2.1	–1.1	0.9	1.2	1.1	0.5	1.0	2.5	2.2	3.0	2.2	2.0	3.8	0.8	3.4
Seychelles	8.1	1.4	4.0	–1.0	2.9	3.7	1.8	1.2	9.8	5.6	1.6	2.5	7.9	7.4	–4.2
Sierra Leone	9.5	4.6	6.7	10.9	18.2	16.0	14.8	13.4	11.9	17.3	14.5	7.8	17.9	16.7	12.3
South Africa	5.5	6.1	4.6	6.3	5.3	4.6	4.1	3.3	4.5	5.7	4.6	4.5	5.4	5.5	4.5
South Sudan	. . .	1.7	52.8	379.8	187.9	83.5	51.2	24.0	5.3	16.0	15.0	10.5	0.9	10.0	15.0
Tanzania	8.8	6.1	5.6	5.2	5.3	3.5	3.4	3.3	3.7	4.4	5.4	4.3	4.2	6.3	5.0
Togo	2.7	0.2	1.8	0.9	–0.2	0.9	0.7	1.8	4.3	4.6	2.0	1.7	6.2	0.2	3.9
Uganda	9.2	4.3	3.7	5.2	5.6	2.6	2.3	2.8	2.2	6.1	4.1	5.0	2.9	6.4	4.9
Zambia	11.2	7.8	10.1	17.9	6.6	7.0	9.2	15.7	20.5	15.7	9.2	7.0	16.6	10.8	8.8
Zimbabwe[4]	5.0	–0.2	–2.4	–1.6	0.9	10.6	255.3	557.2	98.5	86.7	46.5	7.0	60.7	85.8	42.0

[1]Movements in consumer prices are shown as annual averages.
[2]Monthly year-over-year changes and, for several countries, on a quarterly basis.
[3]Based on Eurostat's harmonized index of consumer prices.
[4]See the country-specific notes for Afghanistan, Argentina, Lebanon, Libya, Tunisia, Ukraine, Venezuela, and Zimbabwe in the "Country Notes" section of the Statistical Appendix.
[5]Excludes 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.
[6]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[7]Data for Syria are excluded for 2011 onward owing to the uncertain political situation.

Table A8. Major Advanced Economies: General Government Fiscal Balances and Debt[1]

(Percent of GDP, unless noted otherwise)

	Average									Projections		
	2004–13	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Major Advanced Economies												
Net Lending/Borrowing	–5.3	–3.6	–3.0	–3.3	–3.2	–3.4	–3.8	–11.9	–8.4	–4.9	–3.3	–3.6
Output Gap[2]	–2.2	–2.8	–2.0	–1.7	–0.8	–0.1	0.2	–3.4	–0.9	0.4	0.6	0.0
Structural Balance[2]	–4.2	–2.5	–2.2	–2.7	–2.9	–3.3	–3.9	–8.0	–6.5	–5.0	–3.6	–3.5
United States												
Net Lending/Borrowing[3]	–6.5	–4.0	–3.5	–4.3	–4.6	–5.4	–5.7	–14.5	–10.2	–4.8	–4.0	–5.2
Output Gap[2]	–3.7	–4.0	–2.5	–2.1	–1.3	0.0	0.7	–3.3	0.3	1.6	1.5	0.0
Structural Balance[2]	–4.5	–2.7	–2.5	–3.5	–4.2	–5.2	–6.1	–10.4	–8.0	–5.3	–4.6	–5.1
Net Debt	60.6	81.1	80.9	81.9	80.3	81.2	83.0	98.7	101.3	95.8	94.9	105.6
Gross Debt	82.3	104.6	105.1	107.2	106.2	107.5	108.8	134.2	132.6	125.6	123.7	127.4
Euro Area												
Net Lending/Borrowing	–3.3	–2.5	–2.0	–1.5	–0.9	–0.4	–0.6	–7.2	–5.5	–4.3	–2.5	–1.7
Output Gap[2]	–0.4	–2.9	–2.3	–1.6	–0.6	–0.1	0.1	–4.3	–2.4	–1.0	–0.4	0.1
Structural Balance[2]	–3.0	–0.7	–0.6	–0.5	–0.5	–0.3	–0.5	–4.5	–4.0	–3.5	–2.3	–1.7
Net Debt	62.8	76.1	75.0	74.5	72.4	70.6	69.1	79.6	79.2	79.2	78.1	75.1
Gross Debt	78.1	92.7	90.8	90.0	87.5	85.5	83.5	97.3	96.0	95.2	93.4	88.9
Germany												
Net Lending/Borrowing	–1.7	0.6	1.0	1.2	1.3	1.9	1.5	–4.3	–3.7	–3.3	–0.7	0.4
Output Gap[2]	–0.2	–0.3	–0.3	0.1	1.0	0.8	0.4	–2.6	–2.1	–1.1	–0.3	0.0
Structural Balance[2]	–1.4	1.2	1.2	1.2	1.1	1.6	1.3	–3.1	–2.6	–2.0	–0.5	0.4
Net Debt	57.5	54.9	52.2	49.3	45.4	42.6	40.5	46.3	49.0	51.1	49.0	42.2
Gross Debt	72.3	75.3	72.0	69.0	64.7	61.3	58.9	68.7	70.2	70.9	67.7	58.7
France												
Net Lending/Borrowing	–4.4	–3.9	–3.6	–3.6	–3.0	–2.3	–3.1	–9.1	–7.0	–5.6	–3.8	–3.3
Output Gap[2]	–0.4	–2.2	–2.4	–2.5	–1.6	–0.8	0.0	–4.8	–1.8	–0.5	–0.6	0.0
Structural Balance[2]	–4.1	–2.5	–2.1	–2.0	–1.9	–1.5	–2.1	–5.9	–5.9	–5.3	–3.4	–3.3
Net Debt	67.4	85.5	86.3	89.2	89.4	89.2	88.8	102.6	99.8	100.1	100.4	101.4
Gross Debt	77.1	94.9	95.6	98.0	98.1	97.8	97.4	115.2	112.3	112.6	112.9	114.0
Italy												
Net Lending/Borrowing	–3.4	–3.0	–2.6	–2.4	–2.4	–2.2	–1.5	–9.6	–7.2	–6.0	–3.9	–2.5
Output Gap[2]	–0.6	–4.1	–3.4	–2.6	–1.6	–1.1	–1.1	–6.1	–4.1	–1.2	–0.3	0.5
Structural Balance[2]	–3.4	–1.0	–0.6	–1.3	–1.6	–1.7	–1.0	–6.0	–4.6	–5.2	–3.7	–2.7
Net Debt	104.3	121.4	122.2	121.6	121.3	121.8	121.7	141.8	138.3	138.5	137.1	132.6
Gross Debt	114.3	135.4	135.3	134.8	134.2	134.4	134.1	155.3	150.9	150.6	148.7	142.9
Japan												
Net Lending/Borrowing	–6.3	–5.6	–3.7	–3.6	–3.1	–2.5	–3.0	–9.0	–7.6	–7.8	–3.5	–2.8
Output Gap[2]	–1.6	–2.3	–1.5	–1.5	–0.5	–0.7	–1.4	–2.7	–2.6	–1.7	–0.4	0.0
Structural Balance[2]	–5.8	–5.4	–4.2	–4.1	–3.3	–2.5	–2.5	–8.1	–6.9	–7.3	–3.3	–2.8
Net Debt	115.7	145.1	144.6	149.6	148.1	151.1	151.4	162.4	168.9	172.1	171.0	174.5
Gross Debt[4]	195.1	233.5	228.4	232.5	231.4	232.5	236.1	259.0	263.1	262.5	258.3	261.8
United Kingdom												
Net Lending/Borrowing	–5.6	–5.5	–4.5	–3.3	–2.4	–2.2	–2.2	–12.8	–8.0	–4.3	–2.3	–1.0
Output Gap[2]	–1.1	–1.8	–1.0	–0.5	0.1	0.3	0.6	–3.5	–0.1	0.4	–0.7	0.0
Structural Balance[2]	–4.8	–3.9	–3.6	–2.8	–2.3	–2.4	–2.7	0.5	–3.2	–4.4	–2.0	–1.1
Net Debt	52.9	77.3	77.6	76.9	75.7	74.8	74.1	90.2	84.3	76.1	71.3	59.2
Gross Debt	59.1	85.5	86.0	85.8	85.1	84.5	83.9	102.6	95.3	87.8	82.7	70.7
Canada												
Net Lending/Borrowing	–1.0	0.2	–0.1	–0.5	–0.1	0.4	0.0	–11.4	–4.7	–2.2	–0.8	–0.3
Output Gap[2]	0.0	1.0	–0.1	–0.9	0.4	0.6	0.4	–3.4	–1.5	0.3	0.8	0.0
Structural Balance[2]	–0.9	–0.6	0.0	0.1	–0.3	0.0	–0.2	–8.6	–3.6	–2.3	–1.3	–0.3
Net Debt[5]	26.5	28.5	28.6	28.5	25.8	25.7	23.1	33.6	33.2	32.1	31.6	27.6
Gross Debt	76.1	85.6	91.2	91.8	88.9	88.9	87.2	117.8	112.1	101.8	98.5	87.7

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.

[1]Debt 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.

[2]Percent of potential GDP.

[3]Figures reported by the national statistical agency are adjusted to exclude items related to the accrual-basis accounting of government employees' defined-benefit pension plans.

[4]Nonconsolidated basis.

[5]Includes equity shares.

Table A9. Summary of World Trade Volumes and Prices

(Annual percent change, unless noted otherwise)

	Averages										Projections	
	2004–13	2014–23	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Trade in Goods and Services												
World Trade[1]												
Volume	5.4	3.0	3.8	3.0	2.3	5.6	4.0	0.9	–7.9	10.1	5.0	4.4
Price Deflator												
In US Dollars	4.1	0.5	–1.8	–13.3	–4.0	4.3	5.5	–2.4	–2.2	12.6	7.8	0.6
In SDRs	3.2	1.2	–1.7	–5.9	–3.4	4.6	3.3	0.0	–3.0	10.1	10.2	–0.5
Volume of Trade												
Exports												
Advanced Economies	4.5	2.8	3.8	3.8	2.1	4.9	3.6	1.3	–9.1	8.6	5.0	4.7
Emerging Market and Developing Economies	7.4	3.4	3.4	2.0	2.8	6.5	4.1	0.4	–4.8	12.3	4.1	3.6
Imports												
Advanced Economies	3.7	3.2	3.9	4.8	2.5	4.8	3.8	2.1	–8.7	9.5	6.1	4.5
Emerging Market and Developing Economies	9.1	2.8	4.3	–0.6	1.7	7.5	5.1	–1.1	–7.9	11.8	3.9	4.8
Terms of Trade												
Advanced Economies	–0.4	0.3	0.3	1.8	1.1	–0.2	–0.4	0.2	0.8	0.7	–1.1	0.3
Emerging Market and Developing Economies	1.5	–0.4	–0.7	–4.4	–1.5	1.5	1.1	–1.3	–1.2	1.4	1.9	–1.0
Trade in Goods												
World Trade[1]												
Volume	5.3	3.1	3.0	2.3	2.1	5.6	3.8	0.2	–4.9	10.9	4.4	3.8
Price Deflator												
In US Dollars	4.2	0.3	–2.4	–14.5	–4.8	4.9	5.8	–3.1	–2.6	14.0	9.0	0.2
In SDRs	3.4	1.1	–2.3	–7.2	–4.2	5.1	3.6	–0.7	–3.4	11.5	11.5	–0.9
World Trade Prices in US Dollars[2]												
Manufactures	2.6	0.8	–0.5	–3.0	–5.2	0.1	2.0	0.5	–3.2	6.8	8.8	2.9
Oil	13.7	–1.2	–7.5	–47.2	–15.7	23.3	29.4	–10.2	–32.7	67.3	54.7	–13.3
Nonfuel Primary Commodities	8.4	2.2	–5.5	–17.1	–0.4	6.4	1.3	0.7	6.8	26.8	11.4	–2.5
Food	5.8	1.4	–1.6	–16.9	1.5	3.8	–1.2	–3.1	1.7	27.8	13.9	–5.7
Beverages	6.8	2.6	20.1	–7.2	–3.1	–4.7	–8.2	–3.8	3.5	22.7	15.7	–2.9
Agricultural Raw Materials	4.6	–1.0	–7.5	–11.5	0.0	5.2	2.0	–5.4	–3.3	15.8	4.3	–6.6
Metal	13.1	3.1	–12.2	–27.3	–5.3	22.2	6.6	3.7	3.5	46.8	9.9	–0.1
World Trade Prices in SDRs[2]												
Manufactures	1.8	1.6	–0.4	5.3	–4.6	0.4	–0.1	3.0	–4.0	4.4	11.2	1.7
Oil	12.7	–0.4	–7.5	–42.7	–15.1	23.6	26.7	–8.0	–33.3	63.5	58.1	–14.3
Nonfuel Primary Commodities	7.5	3.0	–5.5	–10.0	0.3	6.6	–0.8	3.2	5.9	23.9	13.9	–3.5
Food	4.9	2.2	–1.5	–9.8	2.2	4.1	–3.3	–0.7	0.9	24.9	16.4	–6.7
Beverages	5.9	3.4	20.1	0.7	–2.5	–4.5	–10.1	–1.4	2.7	20.0	18.3	–4.0
Agricultural Raw Materials	3.7	–0.2	–7.5	–4.0	0.6	5.5	–0.1	–3.1	–4.1	13.2	6.6	–7.6
Metal	12.2	3.9	–12.1	–21.1	–4.7	22.5	4.4	6.2	2.7	43.6	12.3	–1.2
World Trade Prices in Euros[2]												
Manufactures	1.0	2.5	–0.5	16.2	–5.0	–1.9	–2.5	6.1	–5.1	2.9	15.5	1.4
Oil	11.9	0.4	–7.6	–36.8	–15.4	20.8	23.7	–5.2	–34.0	61.3	64.3	–14.5
Nonfuel Primary Commodities	6.7	3.9	–5.6	–0.7	–0.1	4.2	–3.1	6.3	4.7	22.2	18.3	–3.8
Food	4.1	3.1	–1.6	–0.5	1.8	1.7	–5.6	2.3	–0.3	23.2	20.9	–7.0
Beverages	5.1	4.3	20.0	11.1	–2.8	–6.6	–12.2	1.5	1.5	18.3	22.9	–4.2
Agricultural Raw Materials	2.9	0.6	–7.6	5.9	0.3	3.1	–2.5	–0.2	–5.2	11.7	10.7	–7.9
Metal	11.3	4.8	–12.2	–12.9	–5.0	19.7	1.9	9.4	1.5	41.6	16.7	–1.5

Table A9. Summary of World Trade Volumes and Prices *(continued)*

(Annual percent change, unless noted otherwise)

	Averages										Projections	
	2004–13	2014–23	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Trade in Goods												
Volume of Trade												
Exports												
Advanced Economies	4.4	2.7	3.1	3.1	1.7	4.9	3.1	0.5	–6.3	9.4	4.0	4.3
Emerging Market and Developing Economies	7.2	3.3	2.7	1.5	2.7	6.6	3.8	–0.6	–1.1	11.6	3.6	3.1
Fuel Exporters	4.8	0.1	–0.5	2.4	0.8	0.9	–0.8	–4.5	–6.2	1.0	8.8	–0.3
Nonfuel Exporters	7.9	3.9	3.7	1.3	3.0	7.6	4.7	0.2	–0.2	13.0	2.9	3.8
Imports												
Advanced Economies	3.8	3.2	3.4	3.7	2.2	4.8	3.7	0.6	–5.7	10.9	5.6	3.8
Emerging Market and Developing Economies	9.1	3.1	2.7	–0.4	2.1	7.4	5.2	–0.1	–5.5	12.5	3.8	3.9
Fuel Exporters	9.9	–0.7	4.3	0.1	–6.8	–0.9	–3.3	1.5	–11.7	1.2	10.0	0.3
Nonfuel Exporters	9.0	3.6	2.4	–0.4	3.5	8.6	6.4	–0.2	–4.7	13.8	3.1	4.3
Price Deflators in SDRs												
Exports												
Advanced Economies	2.2	1.0	–1.9	–6.4	–2.2	4.3	2.8	–1.4	–2.2	10.4	8.6	–0.4
Emerging Market and Developing Economies	6.2	1.2	–3.2	–9.2	–7.0	7.0	5.1	0.3	–5.7	14.8	15.6	–2.2
Fuel Exporters	10.3	0.1	–7.6	–30.1	–10.8	15.7	15.2	–3.3	–22.2	38.8	39.1	–9.1
Nonfuel Exporters	5.0	1.6	–1.9	–3.6	–6.3	5.4	3.2	1.1	–2.7	11.6	12.1	–0.8
Imports												
Advanced Economies	2.7	0.7	–2.0	–8.1	–3.5	4.5	3.4	–1.5	–3.3	9.1	10.0	–0.3
Emerging Market and Developing Economies	4.3	1.7	–2.7	–5.0	–5.5	5.8	3.7	0.5	–3.1	13.2	13.4	–1.2
Fuel Exporters	4.2	2.0	–2.8	–2.5	–3.7	3.5	1.5	3.0	–1.3	10.9	13.2	–0.1
Nonfuel Exporters	4.3	1.6	–2.7	–5.4	–5.8	6.2	4.0	0.2	–3.3	13.5	13.4	–1.4
Terms of Trade												
Advanced Economies	–0.4	0.3	0.2	1.8	1.3	–0.2	–0.7	0.1	1.2	1.2	–1.3	–0.1
Emerging Market and Developing Economies	1.7	–0.5	–0.5	–4.4	–1.6	1.1	1.3	–0.2	–2.7	1.4	2.0	–1.0
Regional Groups												
Emerging and Developing Asia	–0.9	–0.1	2.4	8.4	0.2	–3.5	–2.3	1.2	0.7	–6.2	–3.1	2.2
Emerging and Developing Europe	3.0	–0.2	–0.7	–10.6	–6.2	2.9	4.4	0.6	–3.5	8.7	7.2	–2.9
Latin America and the Caribbean	2.5	–0.4	–2.5	–8.8	0.9	4.2	0.2	–0.2	0.8	4.1	–0.3	–1.5
Middle East and Central Asia	4.3	–1.5	–3.9	–24.3	–5.5	9.8	10.8	–5.0	–17.8	21.0	18.5	–8.6
Sub-Saharan Africa	4.5	0.0	–3.8	–15.0	–1.4	9.3	4.8	–2.3	–0.1	10.5	5.0	–4.6
Analytical Groups												
By Source of Export Earnings												
Fuel	5.8	–1.9	–5.0	–28.3	–7.4	11.8	13.5	–6.1	–21.2	25.2	22.9	–9.0
Nonfuel	0.7	0.0	0.9	1.9	–0.5	–0.7	–0.8	0.8	0.6	–1.7	–1.1	0.5
Memorandum												
World Exports in Billions of US Dollars												
Goods and Services	17,868	25,194	23,795	21,127	20,752	22,882	25,073	24,652	22,253	27,635	31,144	32,625
Goods	14,187	19,483	18,639	16,201	15,745	17,457	19,109	18,540	17,222	21,752	24,631	25,532
Average Oil Price[3]	13.7	–1.2	–7.5	–47.2	–15.7	23.3	29.4	–10.2	–32.7	67.3	54.7	–13.3
In US Dollars a Barrel	77.74	68.22	96.25	50.79	42.84	52.81	68.33	61.39	41.29	69.07	106.83	92.63
Export Unit Value of Manufactures[4]	2.6	0.8	–0.5	–3.0	–5.2	0.1	2.0	0.5	–3.2	6.8	8.8	2.9

[1]Average of annual percent change for world exports and imports.
[2]As 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.
[3]Percent change of average of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil prices.
[4]Percent change for manufactures exported by the advanced economies.

Table A10. Summary of Current Account Balances

(Billions of US dollars)

									Projections		
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Advanced Economies	**225.4**	**272.6**	**367.7**	**488.9**	**401.2**	**337.9**	**207.8**	**379.3**	**–65.0**	**23.4**	**435.8**
United States	–370.0	–408.9	–397.6	–361.7	–438.2	–472.1	–616.1	–806.6	–877.8	–855.4	–636.7
Euro Area	316.9	313.5	364.0	402.1	392.4	306.7	250.0	345.2	257.1	344.1	479.3
Germany	280.3	288.8	295.1	288.9	316.3	294.3	272.5	314.0	249.8	313.4	369.3
France	–27.3	–9.0	–12.0	–19.8	–23.2	–7.9	–49.8	–27.4	–54.0	–51.3	–30.3
Italy	41.0	26.4	48.9	50.7	52.9	64.8	70.9	69.1	36.6	52.5	75.7
Spain	23.3	24.2	39.1	36.4	26.7	29.3	10.6	13.4	4.3	6.6	27.3
Japan	36.8	136.4	197.8	203.5	177.8	176.0	148.8	141.7	117.2	142.2	202.0
United Kingdom	–157.9	–152.7	–145.6	–98.1	–112.6	–76.8	–69.0	–82.5	–184.4	–178.1	–161.2
Canada	–41.9	–54.4	–47.2	–46.2	–41.0	–35.5	–29.4	1.2	24.6	–2.1	–51.0
Other Advanced Economies[1]	350.8	350.4	330.0	333.2	331.6	349.2	409.1	602.3	518.4	487.7	502.7
Emerging Market and Developing Economies	**160.0**	**–75.5**	**–99.2**	**–22.5**	**–52.2**	**0.7**	**160.1**	**365.3**	**682.3**	**420.7**	**–112.3**
Regional Groups											
Emerging and Developing Asia	227.6	296.7	212.2	166.4	–51.3	92.9	319.5	247.9	156.0	132.7	–21.9
Emerging and Developing Europe	–10.9	34.2	–8.4	–20.0	66.1	50.0	0.3	71.1	130.9	70.3	–13.5
Latin America and the Caribbean	–190.2	–172.8	–102.5	–94.9	–142.1	–107.7	–8.9	–82.0	–65.9	–70.6	–107.3
Middle East and Central Asia	198.4	–140.6	–146.0	–39.1	114.8	22.5	–101.7	149.1	496.4	343.4	102.0
Sub-Saharan Africa	–64.8	–92.9	–54.5	–34.8	–39.7	–57.0	–49.1	–20.8	–35.1	–55.1	–71.6
Analytical Groups											
By Source of Export Earnings											
Fuel	250.9	–144.6	–99.0	40.8	204.7	78.4	–84.2	204.7	601.0	426.5	160.4
Nonfuel	–88.9	71.0	1.9	–61.2	–254.8	–75.9	246.2	162.9	83.7	–3.2	–270.3
Of Which, Primary Products	–57.9	–65.2	–45.4	–57.9	–76.5	–49.3	–5.0	–19.8	–23.2	–29.7	–39.2
By External Financing Source											
Net Debtor Economies	–384.5	–352.7	–271.3	–306.6	–382.4	–300.5	–114.2	–295.0	–346.9	–367.9	–491.8
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2016–20	–56.0	–72.7	–67.3	–55.9	–46.1	–47.6	–30.5	–30.3	. . .	. . .	. . .
Memorandum											
World	**385.4**	**197.1**	**268.5**	**466.4**	**349.0**	**338.6**	**367.9**	**744.6**	**617.2**	**444.1**	**323.5**
European Union	451.9	443.2	472.3	502.2	509.1	450.6	437.2	560.8	348.5	441.5	602.6
Middle East and North Africa	190.1	–122.0	–120.7	–19.4	130.5	41.8	–86.3	154.4	489.9	343.7	116.3
Emerging Market and Middle-Income Economies	202.9	–1.0	–59.2	11.0	2.3	58.8	212.7	430.3	769.7	504.3	–19.0
Low-Income Developing Countries	–42.9	–74.5	–40.1	–33.5	–54.5	–58.1	–52.6	–65.0	–87.4	–83.6	–93.3

Table A10. Summary of Current Account Balances *(continued)*

(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	2023	2027
Advanced Economies	**0.5**	**0.6**	**0.8**	**1.0**	**0.8**	**0.7**	**0.4**	**0.7**	**–0.1**	**0.0**	**0.6**
United States	–2.1	–2.2	–2.1	–1.9	–2.1	–2.2	–2.9	–3.5	–3.5	–3.2	–2.1
Euro Area	2.3	2.7	3.0	3.2	2.9	2.3	1.9	2.4	1.8	2.2	2.6
Germany	7.2	8.6	8.5	7.8	7.9	7.6	7.1	7.4	5.9	6.9	6.9
France	–1.0	–0.4	–0.5	–0.8	–0.8	–0.3	–1.9	–0.9	–1.8	–1.7	–0.8
Italy	1.9	1.4	2.6	2.6	2.5	3.2	3.7	3.3	1.8	2.4	3.0
Spain	1.7	2.0	3.2	2.8	1.9	2.1	0.8	0.9	0.3	0.4	1.5
Japan	0.8	3.1	4.0	4.1	3.5	3.4	3.0	2.9	2.4	2.7	3.2
United Kingdom	–5.1	–5.2	–5.3	–3.6	–3.9	–2.7	–2.5	–2.6	–5.5	–4.8	–3.5
Canada	–2.3	–3.5	–3.1	–2.8	–2.4	–2.0	–1.8	0.1	1.1	–0.1	–1.8
Other Advanced Economies[1]	5.0	5.4	5.0	4.7	4.4	4.7	5.6	7.2	5.9	5.3	4.5
Emerging Market and Developing Economies	**0.5**	**–0.3**	**–0.3**	**–0.1**	**–0.2**	**0.0**	**0.5**	**0.9**	**1.5**	**0.9**	**–0.2**
Regional Groups											
Emerging and Developing Asia	1.5	1.9	1.3	0.9	–0.3	0.5	1.5	1.0	0.6	0.4	–0.1
Emerging and Developing Europe	–0.3	1.0	–0.3	–0.5	1.7	1.3	0.0	1.7	3.2	1.7	–0.3
Latin America and the Caribbean	–3.2	–3.3	–2.0	–1.7	–2.7	–2.1	–0.2	–1.6	–1.2	–1.2	–1.5
Middle East and Central Asia	4.9	–3.9	–4.1	–1.1	2.9	0.5	–2.5	3.0	8.3	5.6	1.4
Sub-Saharan Africa	–3.6	–5.7	–3.6	–2.2	–2.3	–3.2	–3.0	–1.1	–1.7	–2.5	–2.3
Analytical Groups											
By Source of Export Earnings											
Fuel	6.1	–4.0	–2.9	1.2	5.4	2.0	–2.3	4.4	10.6	7.3	2.3
Nonfuel	–0.3	0.3	0.0	–0.2	–0.8	–0.2	0.8	0.5	0.2	0.0	–0.5
Of Which, Primary Products	–2.8	–3.2	–2.3	–2.7	–3.7	–2.5	–0.3	–0.9	–1.0	–1.2	–1.3
By External Financing Source											
Net Debtor Economies	–2.8	–2.8	–2.1	–2.2	–2.7	–2.0	–0.8	–1.9	–2.1	–2.1	–2.1
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2016–20	–4.8	–6.6	–6.3	–5.5	–4.3	–4.2	–2.7	–2.4	. . .	. . .	. . .
Memorandum											
World	**0.5**	**0.3**	**0.4**	**0.6**	**0.4**	**0.4**	**0.4**	**0.8**	**0.6**	**0.4**	**0.2**
European Union	2.9	3.3	3.4	3.4	3.2	2.9	2.9	3.3	2.0	2.4	2.7
Middle East and North Africa	5.8	–4.3	–4.2	–0.7	4.0	1.2	–2.6	3.6	9.5	6.6	1.9
Emerging Market and Middle-Income Economies	0.7	0.0	–0.2	0.0	0.0	0.2	0.7	1.1	1.8	1.1	0.0
Low-Income Developing Countries	–2.1	–3.8	–2.1	–1.7	–2.6	–2.6	–2.3	–2.7	–3.3	–2.9	–2.2

Table A10. Summary of Current Account Balances *(continued)*

(Percent of exports of goods and services)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	2023	2027
Advanced Economies	**1.5**	**2.0**	**2.7**	**3.3**	**2.5**	**2.2**	**1.5**	**2.2**	**–0.3**	**0.1**	**1.8**
United States	–15.5	–17.9	–17.8	–15.1	–17.3	–18.7	–28.9	–31.9	–30.0	–27.0	–16.4
Euro Area	8.9	9.7	11.2	11.3	10.1	8.0	7.2	8.3	. . .	. . .	. . .
Germany	15.8	18.3	18.5	16.6	16.8	16.2	16.3	15.6	12.3	14.7	14.6
France	–3.1	–1.2	–1.5	–2.4	–2.5	–0.9	–6.6	–3.0	–5.2	–4.7	–2.3
Italy	6.5	4.8	8.9	8.4	8.1	10.2	12.8	10.1	5.0	6.6	7.7
Spain	5.1	6.0	9.4	7.9	5.3	6.0	2.7	2.7	0.8	1.1	3.6
Japan	4.3	17.4	24.4	23.2	19.1	19.5	18.8	15.5	11.8	13.4	16.6
United Kingdom	–18.2	–19.0	–18.9	–12.1	–12.7	–8.6	–8.8	–9.6	–20.0	–17.4	–12.5
Canada	–7.3	–11.0	–9.8	–8.9	–7.4	–6.3	–6.1	0.2	3.3	–0.3	–6.2
Other Advanced Economies[1]	8.4	9.4	9.0	8.3	7.7	8.3	10.5	12.3	9.3	8.4	7.3
Emerging Market and Developing Economies	**2.0**	**–0.9**	**–1.3**	**–0.3**	**–0.7**	**0.0**	**2.0**	**3.4**	**5.4**	**3.2**	**–0.8**
Regional Groups											
Emerging and Developing Asia	5.7	7.8	5.8	4.1	–1.1	2.1	7.3	4.4	2.5	2.0	–0.3
Emerging and Developing Europe	–0.7	2.9	–0.7	–1.5	4.3	3.3	0.0	4.0	7.0	3.7	–0.6
Latin America and the Caribbean	–15.3	–16.0	–9.7	–8.1	–11.2	–8.6	–0.8	–6.0	–4.3	–4.4	–5.7
Middle East and Central Asia	12.7	–10.5	–12.0	–3.3	6.7	1.2	–8.8	9.4	22.5	16.4	4.8
Sub-Saharan Africa	–14.2	–27.0	–17.1	–9.4	–9.4	–13.8	–14.6	–4.7	–6.3	–9.8	–10.9
Analytical Groups											
By Source of Export Earnings											
Fuel	14.8	–10.9	–8.3	2.8	12.5	5.1	–7.7	13.4	27.4	21.1	8.4
Nonfuel	–1.3	1.1	0.0	–0.9	–3.3	–1.0	3.4	1.8	0.8	0.0	–2.0
Of Which, Primary Products	–11.8	–15.4	–10.8	–12.3	–15.1	–9.9	–1.1	–3.3	–3.4	–4.1	–4.5
By External Financing Source											
Net Debtor Economies	–10.6	–11.0	–8.5	–8.4	–9.5	–7.4	–3.2	–6.5	–6.7	–6.7	–7.2
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2016–20	–17.3	–29.1	–29.9	–21.7	–15.5	–16.0	–12.2	–9.7	–10.2	–14.0	–11.6
Memorandum											
World	**1.7**	**1.0**	**1.3**	**2.0**	**1.3**	**1.4**	**1.7**	**2.7**	**1.9**	**1.3**	**0.8**
European Union	6.3	6.9	7.2	7.0	6.4	5.8	6.1	6.5	3.8	4.5	5.0
Middle East and North Africa	13.8	–10.1	–11.0	–2.0	8.6	2.8	–8.4	10.9	24.9	18.5	6.2
Emerging Market and Middle-Income Economies	2.7	0.1	–0.8	0.1	–0.1	0.6	2.8	4.3	6.6	4.2	–0.2
Low-Income Developing Countries	–8.1	–15.5	–8.3	–6.0	–8.5	–8.5	–8.3	–8.8	–10.0	–9.0	–7.4

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

Table A11. Advanced Economies: Current Account Balance

(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	2023	2027
Advanced Economies	**0.5**	**0.6**	**0.8**	**1.0**	**0.8**	**0.7**	**0.4**	**0.7**	**–0.1**	**0.0**	**0.6**
United States	–2.1	–2.2	–2.1	–1.9	–2.1	–2.2	–2.9	–3.5	–3.5	–3.2	–2.1
Euro Area[1]	2.3	2.7	3.0	3.2	2.9	2.3	1.9	2.4	1.8	2.2	2.6
Germany	7.2	8.6	8.5	7.8	7.9	7.6	7.1	7.4	5.9	6.9	6.9
France	–1.0	–0.4	–0.5	–0.8	–0.8	–0.3	–1.9	–0.9	–1.8	–1.7	–0.8
Italy	1.9	1.4	2.6	2.6	2.5	3.2	3.7	3.3	1.8	2.4	3.0
Spain	1.7	2.0	3.2	2.8	1.9	2.1	0.8	0.9	0.3	0.4	1.5
The Netherlands	8.2	6.3	8.1	10.8	10.8	9.4	7.0	9.5	7.4	7.3	6.1
Belgium	0.8	1.4	0.6	0.7	–0.8	0.2	0.8	0.9	0.5	0.9	1.7
Ireland	1.1	4.4	–4.2	0.5	4.9	–19.9	–2.7	13.9	10.2	8.4	7.0
Austria	2.5	1.7	2.7	1.4	0.9	2.1	1.9	–0.6	–0.6	0.8	2.1
Portugal	0.2	0.2	1.2	1.3	0.6	0.4	–1.1	–1.1	–2.6	–1.4	–0.4
Greece	–2.4	–1.5	–2.4	–2.6	–3.6	–2.2	–7.3	–6.4	–6.3	–6.1	–2.7
Finland	–1.3	–0.9	–2.0	–0.8	–1.8	–0.3	0.8	0.9	0.4	0.0	–0.4
Slovak Republic	1.1	–2.1	–2.7	–1.9	–2.2	–3.4	0.1	–2.0	–5.0	–4.8	–2.3
Lithuania	3.2	–2.8	–0.8	0.6	0.3	3.5	7.3	2.7	–0.7	–2.1	–0.9
Slovenia	5.1	3.8	4.8	6.2	6.0	6.0	7.4	3.3	–0.5	–1.4	–2.7
Luxembourg	4.9	4.8	4.8	4.7	4.7	4.6	4.3	2.8	2.0	2.7	3.9
Latvia	–1.6	–0.6	1.6	1.3	–0.2	–0.7	2.9	–2.9	–1.6	–1.7	–0.2
Estonia	0.7	1.8	1.2	2.3	0.8	2.5	–0.3	–1.1	1.6	1.8	–0.4
Cyprus	–4.1	–0.4	–4.2	–5.1	–4.0	–5.7	–10.1	–7.6	–9.4	–8.3	–5.6
Malta	8.5	2.7	–0.6	5.9	6.4	5.4	–3.1	–5.1	–1.7	–1.4	1.8
Japan	0.8	3.1	4.0	4.1	3.5	3.4	3.0	2.9	2.4	2.7	3.2
United Kingdom	–5.1	–5.2	–5.3	–3.6	–3.9	–2.7	–2.5	–2.6	–5.5	–4.8	–3.5
Korea	5.6	7.2	6.5	4.6	4.5	3.6	4.6	4.9	2.2	3.2	4.1
Canada	–2.3	–3.5	–3.1	–2.8	–2.4	–2.0	–1.8	0.1	1.1	–0.1	–1.8
Taiwan Province of China	11.3	13.6	13.1	14.1	11.6	10.7	14.2	14.7	13.2	11.6	8.5
Australia	–3.0	–4.6	–3.3	–2.6	–2.1	0.6	2.6	3.5	3.0	0.5	–0.1
Switzerland	7.5	9.4	8.0	6.3	6.1	5.4	2.8	9.3	6.3	7.0	7.0
Sweden	4.2	3.3	2.4	3.0	2.7	5.5	6.1	5.5	4.9	4.4	3.6
Singapore	18.0	18.7	17.6	17.3	15.2	14.5	16.8	18.1	13.0	12.7	12.0
Hong Kong SAR	1.4	3.3	4.0	4.6	3.7	5.9	7.0	11.2	10.9	9.4	7.4
Czech Republic	0.2	0.4	1.8	1.5	0.4	0.3	3.6	–0.8	–0.7	–1.2	–0.5
Israel	4.1	5.2	3.6	3.6	2.8	3.4	5.4	4.6	3.2	3.1	2.2
Norway	10.8	8.0	4.5	5.5	8.0	2.9	1.1	15.3	19.9	16.8	10.4
Denmark	8.9	8.2	7.8	8.0	7.3	8.8	8.1	8.4	7.3	7.1	6.6
New Zealand	–3.1	–2.8	–2.1	–2.8	–4.0	–2.9	–0.8	–5.8	–6.5	–5.3	–4.3
Puerto Rico	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Macao SAR	32.7	23.3	26.5	30.8	33.0	33.8	15.2	13.8	3.5	14.9	26.2
Iceland	4.4	5.6	8.1	4.2	3.5	5.8	0.8	–2.8	0.6	1.0	0.9
Andorra	. . .	. . .	. . .	. . .	. . .	18.0	14.6	15.9	16.9	17.4	19.2
San Marino	. . .	. . .	. . .	–0.1	–1.9	6.2	3.7	2.7	0.3	1.2	0.2
Memorandum											
Major Advanced Economies	–0.7	–0.5	–0.2	0.0	–0.2	–0.1	–0.7	–0.9	–1.5	–1.2	–0.4
Euro Area[2]	3.0	3.4	3.6	3.6	3.5	3.0	2.8	3.6	2.3	2.8	3.2

[1]Data corrected for reporting discrepancies in intra-area transactions.
[2]Data 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)

									Projections		
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Emerging and Developing Asia	**1.5**	**1.9**	**1.3**	**0.9**	**–0.3**	**0.5**	**1.5**	**1.0**	**0.6**	**0.4**	**–0.1**
Bangladesh	0.8	1.8	1.9	–0.5	–3.5	–1.5	–1.7	–1.3	–3.2	–2.9	–2.4
Bhutan	–27.1	–27.9	–30.2	–23.6	–18.4	–20.5	–12.4	–11.8	–10.6	–9.7	0.2
Brunei Darussalam	31.9	16.7	12.9	16.4	6.9	6.6	4.5	5.6	18.2	15.0	13.0
Cambodia	–8.6	–8.7	–8.5	–7.9	–11.8	–15.0	–12.1	–26.7	–17.4	–9.5	–9.2
China	2.2	2.6	1.7	1.5	0.2	0.7	1.7	1.8	1.1	1.0	0.4
Fiji	–5.8	–4.5	–3.6	–6.7	–8.3	–12.5	–12.6	–16.9	–13.0	–10.6	–8.2
India	–1.3	–1.0	–0.6	–1.8	–2.1	–0.9	0.9	–1.6	–3.1	–2.7	–2.6
Indonesia	–3.1	–2.0	–1.8	–1.6	–2.9	–2.7	–0.4	0.3	4.5	0.5	–1.5
Kiribati	31.5	33.0	10.8	37.4	38.8	48.8	39.1	16.9	7.1	9.9	10.0
Lao P.D.R.	–23.3	–22.3	–11.0	–11.1	–13.0	–9.1	–4.5	–5.0	–6.0	–6.9	–7.1
Malaysia	4.3	3.0	2.4	2.8	2.2	3.5	4.2	3.5	3.9	3.9	3.6
Maldives	–3.7	–7.5	–23.6	–21.6	–28.4	–26.6	–35.5	–15.6	–24.2	–17.7	–8.3
Marshall Islands	2.0	15.6	13.5	5.0	4.0	–25.9	16.2	3.4	–4.1	–2.7	–3.9
Micronesia	6.1	4.5	7.2	10.3	21.0	16.6	2.5	0.7	–0.7	–2.5	–5.5
Mongolia	–15.8	–8.2	–6.3	–10.1	–16.7	–15.2	–5.1	–13.0	0.2	–1.5	–5.0
Myanmar	–4.5	–3.5	–4.2	–6.8	–4.7	–2.8	–3.4	–1.3	–0.1	–0.5	–1.0
Nauru	27.3	–19.1	4.1	12.3	8.0	4.9	2.8	4.1	–2.2	0.1	–0.1
Nepal	4.0	4.4	5.5	–0.3	–7.1	–6.9	–1.0	–8.2	–11.4	–7.4	–2.7
Palau	–19.4	–8.9	–13.4	–19.4	–15.6	–31.1	–48.3	–56.9	–51.5	–27.0	–20.4
Papua New Guinea	14.1	24.5	28.4	28.4	24.5	20.6	20.9	22.0	25.1	22.3	18.6
Philippines	3.6	2.4	–0.4	–0.7	–2.6	–0.8	3.2	–1.8	–2.7	–2.2	–1.8
Samoa	–9.1	–2.8	–4.5	–1.9	0.9	3.0	0.2	–15.3	–12.5	–7.2	–2.4
Solomon Islands	–3.8	–2.7	–3.5	–4.2	–3.0	–9.8	–1.6	–5.8	–11.9	–11.9	–9.5
Sri Lanka	–2.5	–2.3	–2.1	–2.6	–3.2	–2.2	–1.3	–4.3	–7.1	–4.6	–3.1
Thailand	2.9	6.9	10.5	9.6	5.6	7.0	4.2	–2.1	–0.1	2.0	3.3
Timor-Leste	75.6	12.8	–33.0	–17.5	–12.1	6.5	–16.2	1.8	–28.0	–35.3	–38.9
Tonga	–6.3	–10.1	–6.5	–6.4	–6.3	–0.9	–3.9	4.9	–3.1	–18.3	–15.3
Tuvalu	–3.7	–70.6	13.9	11.5	53.9	–16.9	–7.9	2.1	–8.6	0.3	–9.7
Vanuatu	7.8	0.3	3.4	–4.4	12.2	13.6	2.5	–1.9	–7.8	–6.0	–4.3
Vietnam	3.7	–0.9	0.2	–0.6	1.9	3.7	4.4	–0.5	–0.1	0.8	0.0
Emerging and Developing Europe	**–0.3**	**1.0**	**–0.3**	**–0.5**	**1.7**	**1.3**	**0.0**	**1.7**	**3.2**	**1.7**	**–0.3**
Albania	–10.8	–8.6	–7.6	–7.5	–6.8	–7.6	–8.7	–7.7	–8.8	–8.0	–7.5
Belarus	–6.6	–3.3	–3.4	–1.7	0.0	–1.9	–0.4	2.7	–1.2	–1.0	–0.9
Bosnia and Herzegovina	–7.4	–5.1	–4.8	–4.8	–3.3	–2.8	–3.8	–2.4	–5.0	–3.9	–3.5
Bulgaria	1.2	0.0	3.1	3.3	0.9	1.9	–0.3	–2.0	–2.2	–2.0	–0.1
Croatia	0.3	3.4	2.3	3.5	1.9	3.0	–0.1	2.0	–0.4	0.3	2.0
Hungary	1.2	2.3	4.5	2.0	0.2	–0.7	–1.6	–0.9	–1.3	0.1	0.5
Kosovo	–7.2	–8.8	–8.0	–5.5	–7.6	–5.7	–7.0	–9.1	–8.9	–7.0	–5.7
Moldova	–6.0	–6.0	–3.6	–5.7	–10.6	–9.3	–7.7	–10.5	–13.0	–12.0	–8.5
Montenegro	–12.4	–11.0	–16.2	–16.1	–17.0	–14.3	–26.0	–9.2	–13.8	–13.0	–12.5
North Macedonia	–0.5	–2.0	–2.9	–1.0	–0.1	–3.3	–3.4	–3.5	–5.8	–3.6	–2.5
Poland	–2.6	–0.9	–0.8	–0.4	–1.3	0.5	2.9	–0.9	–2.9	–2.7	–2.0
Romania	–0.3	–0.8	–1.6	–3.1	–4.6	–4.9	–5.0	–7.1	–7.0	–6.5	–5.6
Russia	2.8	5.0	1.9	2.0	7.0	3.9	2.4	6.9	12.4	8.1	3.1
Serbia	–5.6	–3.5	–2.9	–5.2	–4.8	–6.9	–4.1	–4.4	–6.1	–5.7	–5.0
Turkey	–4.1	–3.2	–3.1	–4.8	–2.8	0.7	–4.9	–1.8	–5.7	–2.0	–1.6
Ukraine[1]	–3.9	1.7	–1.5	–2.2	–3.3	–2.7	3.3	–1.1	. . .	. . .	. . .
Latin America and the Caribbean	**–3.2**	**–3.3**	**–2.0**	**–1.7**	**–2.7**	**–2.1**	**–0.2**	**–1.6**	**–1.2**	**–1.2**	**–1.5**
Antigua and Barbuda	0.3	2.2	–2.4	–8.0	–14.5	–7.5	–18.4	–19.7	–23.6	–16.8	–10.2
Argentina	–1.6	–2.7	–2.7	–4.8	–5.2	–0.8	0.9	1.3	0.5	0.4	0.7
Aruba	–4.8	3.9	4.6	1.0	–0.5	2.5	–13.1	9.0	–2.7	–4.1	1.3
The Bahamas	–19.7	–12.4	–12.3	–13.7	–9.3	–2.7	–23.5	–19.3	–18.1	–12.6	–5.2
Barbados	–9.2	–6.1	–4.3	–3.8	–4.0	–3.1	–6.9	–11.4	–12.3	–9.0	–3.8
Belize	–8.1	–10.1	–9.1	–8.6	–8.0	–9.5	–8.1	–8.9	–9.3	–8.9	–7.7
Bolivia	1.7	–5.8	–5.6	–5.0	–4.3	–3.3	–0.4	0.5	–1.5	–2.0	–4.0
Brazil	–4.1	–3.0	–1.4	–1.1	–2.7	–3.5	–1.7	–1.7	–1.5	–1.6	–2.1
Chile	–3.6	–2.8	–2.6	–2.8	–4.6	–5.2	–1.9	–6.7	–4.5	–3.4	–2.5
Colombia	–5.2	–6.4	–4.5	–3.2	–4.2	–4.6	–3.4	–5.7	–3.3	–3.4	–3.9

Table A12. Emerging Market and Developing Economies: Current Account Balance *(continued)*

(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	2023	2027
Latin America and the Caribbean (continued)	**–3.2**	**–3.3**	**–2.0**	**–1.7**	**–2.7**	**–2.1**	**–0.2**	**–1.6**	**–1.2**	**–1.2**	**–1.5**
Costa Rica	–4.7	–3.4	–2.1	–3.6	–3.0	–1.3	–1.1	–3.3	–3.5	–3.2	–2.7
Dominica	–5.4	–4.7	–7.7	–8.6	–42.4	–37.9	–30.0	–31.4	–32.1	–26.0	–13.0
Dominican Republic	–3.2	–1.8	–1.1	–0.2	–1.5	–1.3	–2.0	–2.5	–3.5	–2.5	–2.2
Ecuador	–0.7	–2.2	1.1	–0.2	–1.2	–0.1	2.6	2.5	2.9	2.5	2.1
El Salvador	–5.4	–3.2	–2.3	–1.9	–3.3	–0.6	0.5	–4.3	–6.7	–5.5	–5.1
Grenada	–11.6	–12.5	–11.0	–14.4	–16.1	–14.6	–21.0	–24.5	–27.9	–20.6	–12.4
Guatemala	–3.3	–1.2	1.0	1.1	0.9	2.3	5.5	2.7	0.0	0.3	0.5
Guyana	–6.7	–3.4	1.5	–4.9	–29.0	–54.1	–14.5	–30.0	45.4	36.3	24.5
Haiti	–7.3	–5.1	–1.8	–2.2	–2.9	–1.1	1.1	0.5	0.8	–0.6	–0.8
Honduras	–6.9	–4.7	–3.1	–1.2	–6.6	–2.7	2.8	–4.9	–4.4	–4.8	–4.2
Jamaica	–8.0	–3.0	–0.3	–2.7	–1.6	–2.3	–0.3	0.7	–5.2	–2.1	–4.3
Mexico	–1.9	–2.6	–2.2	–1.7	–2.0	–0.3	2.4	–0.4	–0.6	–0.7	–1.1
Nicaragua	–8.0	–9.9	–8.5	–7.2	–1.8	6.0	5.9	–2.6	–3.0	–1.4	–2.1
Panama	–13.4	–9.0	–7.8	–6.0	–7.6	–5.0	2.2	–2.9	–4.1	–3.3	–2.7
Paraguay	–0.1	–0.4	3.6	3.0	0.1	–0.5	2.7	0.8	–2.9	0.4	0.7
Peru	–4.5	–5.0	–2.6	–1.3	–1.7	–1.0	0.8	–2.8	–1.5	–1.4	–1.4
St. Kitts and Nevis	0.3	–8.3	–12.3	–10.5	–5.5	–2.1	–8.0	–4.8	–5.0	–3.3	–1.0
St. Lucia	–2.5	0.0	–6.5	–2.0	1.5	5.7	–14.7	–10.9	–5.3	–1.0	0.1
St. Vincent and the Grenadines	–24.7	–14.7	–12.7	–11.7	–10.2	–3.1	–15.6	–24.5	–27.7	–26.4	–8.9
Suriname	–7.4	–15.3	–4.8	1.9	–3.0	–11.3	9.1	5.2	–1.0	0.2	–1.1
Trinidad and Tobago	15.0	8.2	–3.5	6.1	6.8	4.3	–0.6	4.5	9.9	7.3	4.7
Uruguay	–3.0	–0.3	0.8	0.0	–0.4	1.6	–0.8	–1.9	–0.2	0.0	–1.3
Venezuela	2.4	–5.0	–1.4	6.1	8.8	6.8	–9.3	–1.4	9.0	6.5	. . .
Middle East and Central Asia	**4.9**	**–3.9**	**–4.1**	**–1.1**	**2.9**	**0.5**	**–2.5**	**3.0**	**8.3**	**5.6**	**1.4**
Afghanistan[1]	6.5	3.7	9.0	7.6	12.2	11.7	11.2	. . .	. . .	. . .	. . .
Algeria	–4.4	–16.4	–16.5	–13.1	–9.6	–9.9	–12.7	–2.8	2.9	–0.2	–5.0
Armenia	–7.8	–2.7	–1.0	–1.5	–7.0	–7.4	–3.8	–2.4	–6.2	–5.9	–5.7
Azerbaijan	13.9	–0.4	–3.6	4.1	12.8	9.1	–0.5	15.2	37.2	28.5	17.1
Bahrain	4.6	–2.4	–4.6	–4.1	–6.4	–2.1	–9.3	6.7	10.8	7.7	1.7
Djibouti	23.9	29.2	–1.0	–4.8	14.2	17.0	10.7	–1.0	–4.7	–3.2	1.5
Egypt	–0.9	–3.7	–6.0	–6.1	–2.4	–3.6	–3.1	–4.6	–4.3	–4.6	–2.6
Georgia	–10.1	–11.8	–12.5	–8.0	–6.8	–5.5	–12.4	–9.8	–11.4	–7.5	–5.6
Iran	2.6	0.3	2.9	3.1	5.2	0.6	–0.1	2.0	3.5	2.0	0.5
Iraq	2.6	–6.4	–7.5	–4.7	4.3	0.5	–10.8	5.9	15.8	10.1	1.7
Jordan	–7.1	–9.0	–9.7	–10.6	–6.9	–2.1	–8.1	–10.1	–5.9	–4.6	–3.1
Kazakhstan	2.8	–3.3	–5.9	–3.1	–0.1	–4.0	–3.8	–3.0	3.0	0.3	–2.1
Kuwait	33.4	3.5	–4.6	8.0	14.4	12.5	3.2	16.1	31.3	27.2	19.0
Kyrgyz Republic	–17.0	–15.9	–11.6	–6.2	–12.1	–12.1	4.5	–5.2	–12.2	–9.3	–6.0
Lebanon[1]	–28.8	–19.8	–23.4	–26.2	–28.4	–28.0	–14.2	. . .	. . .	. . .	. . .
Libya[1]	–78.3	–53.5	–25.4	14.7	26.8	11.9	–20.7	21.6	27.9	19.1	5.4
Mauritania	–22.2	–15.5	–11.0	–10.0	–13.3	–10.5	–7.1	–2.2	–14.0	–13.4	–0.6
Morocco	–6.0	–2.1	–4.1	–3.4	–5.3	–3.7	–1.5	–2.9	–6.0	–4.0	–3.1
Oman	5.2	–15.9	–19.1	–15.6	–5.4	–5.5	–12.0	–3.7	5.9	5.6	1.5
Pakistan	–1.1	–0.9	–1.6	–3.6	–5.4	–4.2	–1.5	–0.6	–5.3	–4.1	–2.5
Qatar	24.0	8.5	–5.5	4.0	9.1	2.4	–2.0	14.7	19.9	15.1	4.8
Saudi Arabia	9.8	–8.7	–3.7	1.5	8.8	4.8	–3.1	6.6	19.5	14.8	4.6
Somalia	–6.5	–6.3	–7.1	–7.7	–6.2	–10.4	–10.8	–14.9	–12.8	–12.4	–13.2
Sudan	–5.8	–8.5	–6.5	–9.4	–14.0	–15.6	–17.5	–5.9	–6.6	–7.0	–6.1
Syria[2]	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tajikistan	–3.4	–6.1	–4.2	2.1	–4.9	–2.2	4.1	2.8	–1.4	–2.2	–1.9
Tunisia[1]	–9.3	–9.1	–8.8	–9.7	–10.4	–7.8	–5.9	–6.2	–10.1	. . .	. . .
Turkmenistan	–7.8	–17.3	–23.1	–11.1	4.9	2.8	–3.3	2.0	5.8	5.9	1.4
United Arab Emirates	13.5	4.9	3.7	7.1	9.8	8.9	5.9	11.7	18.5	14.0	8.2
Uzbekistan	2.6	1.0	0.2	2.4	–6.8	–5.6	–5.0	–7.0	–9.5	–7.4	–5.0
West Bank and Gaza	–13.6	–13.9	–13.9	–13.2	–13.2	–10.4	–12.3	–12.7	–12.8	–12.4	–9.6
Yemen	–0.7	–6.2	–2.8	–1.4	–0.8	–3.8	–6.0	–4.7	–12.3	–9.9	–6.3

Table A12. Emerging Market and Developing Economies: Current Account Balance *(continued)*

(Percent of GDP)

									Projections		
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2027
Sub-Saharan Africa	**–3.6**	**–5.7**	**–3.6**	**–2.2**	**–2.3**	**–3.2**	**–3.0**	**–1.1**	**–1.7**	**–2.5**	**–2.3**
Angola	–2.6	–8.8	–3.1	–0.5	7.3	6.1	1.5	11.3	11.0	4.9	–0.3
Benin	–6.7	–6.0	–3.0	–4.2	–4.6	–4.0	–1.7	–4.5	–5.8	–5.5	–4.0
Botswana	11.1	2.2	8.0	5.6	0.4	–7.0	–10.8	–0.5	0.5	2.8	3.3
Burkina Faso	–7.2	–7.6	–6.1	–5.0	–4.1	–3.3	–0.1	–3.1	–5.7	–5.3	–4.9
Burundi	–15.6	–11.5	–11.1	–11.7	–11.4	–11.6	–10.2	–13.5	–18.6	–15.7	–11.8
Cabo Verde	–9.1	–3.2	–3.8	–7.8	–5.2	–0.4	–15.9	–12.5	–11.5	–8.6	–5.6
Cameroon	–3.9	–3.6	–3.1	–2.6	–3.5	–4.3	–3.7	–3.3	–1.6	–2.9	–3.5
Central African Republic	–13.3	–9.1	–5.3	–7.8	–8.0	–4.9	–8.5	–10.6	–11.0	–8.4	–5.4
Chad	–8.9	–13.8	–10.4	–7.1	–1.4	–4.4	–7.6	–4.5	1.3	–2.3	–6.6
Comoros	–3.8	–0.3	–4.4	–2.1	–2.9	–3.3	–1.6	–3.4	–8.3	–8.2	–7.4
Democratic Republic of the Congo	–4.8	–3.9	–4.1	–3.3	–3.5	–3.2	–2.2	–1.0	–0.3	–0.3	–0.1
Republic of Congo	1.0	–39.0	–48.7	–6.0	–0.1	0.4	–0.1	15.4	26.0	14.7	2.3
Côte d'Ivoire	1.0	–0.4	–0.9	–2.0	–3.9	–2.3	–3.2	–3.7	–4.8	–4.4	–3.6
Equatorial Guinea	–4.3	–17.7	–26.0	–7.8	–2.1	–0.9	–4.2	–3.4	–1.6	–2.0	–5.2
Eritrea	17.3	20.8	15.3	24.0	15.4	13.0	11.4	13.5	13.5	13.3	11.4
Eswatini	11.6	13.0	7.9	6.2	1.3	4.3	6.7	0.5	–2.1	–0.2	0.3
Ethiopia	–7.9	–11.5	–10.9	–8.5	–6.5	–5.3	–4.6	–3.2	–4.5	–4.4	–3.7
Gabon	7.6	–5.6	–11.1	–8.7	–2.1	–0.9	–6.0	–6.9	1.7	–0.1	–1.8
The Gambia	–7.3	–9.9	–9.2	–7.4	–9.5	–6.1	–3.2	–9.5	–14.9	–11.8	–9.4
Ghana	–6.8	–5.7	–5.1	–3.3	–3.0	–2.7	–3.1	–3.0	–3.6	–3.5	–3.4
Guinea	–14.4	–12.5	–30.7	–6.7	–19.2	–11.5	–13.7	–4.0	–9.6	–8.5	–6.8
Guinea-Bissau	0.5	1.8	1.4	0.3	–3.6	–8.8	–2.6	–3.1	–5.6	–4.8	–3.6
Kenya	–9.3	–6.3	–5.4	–7.0	–5.5	–5.3	–4.7	–5.4	–5.8	–5.3	–5.0
Lesotho	–5.2	–4.0	–6.7	–2.6	–1.4	–2.1	–2.0	–9.3	–15.6	–8.9	–4.4
Liberia	–34.7	–28.1	–22.9	–22.3	–21.3	–19.6	–16.3	–17.8	–16.1	–15.9	–14.0
Madagascar	–0.3	–1.6	0.5	–0.4	0.7	–2.3	–5.4	–5.5	–6.5	–6.2	–3.6
Malawi	–5.8	–12.2	–13.1	–17.8	–12.0	–12.6	–13.8	–14.5	–17.3	–15.4	–8.3
Mali	–4.7	–5.3	–7.2	–7.3	–4.9	–7.5	–2.3	–4.5	–5.3	–4.9	–4.8
Mauritius	–5.4	–3.6	–4.0	–4.6	–3.9	–5.4	–12.5	–11.1	–14.0	–8.0	–4.8
Mozambique	–36.3	–37.4	–32.2	–19.6	–30.3	–19.1	–27.6	–22.4	–44.9	–39.0	–9.0
Namibia	–9.4	–13.6	–16.5	–4.4	–3.4	–1.8	3.0	–7.3	–6.9	–4.4	–2.3
Niger	–12.1	–15.3	–11.4	–11.4	–12.6	–12.2	–13.4	–15.8	–15.8	–13.8	–7.8
Nigeria	0.2	–3.1	1.3	3.4	1.5	–3.3	–4.0	–0.8	–1.1	–1.1	–0.7
Rwanda	–11.4	–12.7	–15.3	–9.5	–10.1	–11.9	–11.9	–10.5	–11.4	–10.3	–6.2
São Tomé and Príncipe	–20.7	–12.0	–6.1	–13.2	–12.3	–12.1	–10.3	–9.7	–12.1	–8.7	–4.6
Senegal	–7.0	–5.7	–4.2	–7.3	–8.8	–7.9	–10.9	–11.8	–13.0	–8.4	–4.2
Seychelles	–22.4	–18.1	–19.7	–19.1	–17.4	–16.2	–23.0	–20.3	–30.0	–23.6	–16.1
Sierra Leone	–9.4	–23.6	–7.6	–18.3	–12.4	–14.3	–6.8	–13.0	–17.2	–13.7	–7.8
South Africa	–4.8	–4.3	–2.7	–2.4	–3.0	–2.6	2.0	3.7	1.3	–1.0	–2.0
South Sudan	–1.2	1.7	16.8	4.8	7.3	1.5	–15.6	–7.6	9.5	1.1	1.3
Tanzania	–9.8	–7.7	–4.2	–2.6	–3.1	–2.6	–1.8	–3.3	–4.3	–3.6	–2.5
Togo	–6.8	–7.6	–7.2	–1.5	–2.6	–0.8	–1.5	–3.3	–5.9	–6.4	–2.6
Uganda	–6.5	–6.0	–2.8	–4.8	–5.7	–6.2	–9.3	–7.9	–7.0	–9.8	–9.0
Zambia	2.1	–2.7	–3.3	–1.7	–1.3	0.6	12.0	6.7	4.4	4.3	3.6
Zimbabwe[1]	–12.0	–8.0	–3.4	–1.3	–3.7	4.0	4.7	3.6	2.5	1.5	–2.5

[1]See the country-specific notes for Afghanistan, Lebanon, Libya, Tunisia, Ukraine, and Zimbabwe in the "Country Notes" section of the Statistical Appendix.
[2]Data for Syria are excluded for 2011 onward owing to the uncertain political situation.

Table A13. Summary of Financial Account Balances

(Billions of US dollars)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	Projections 2023
Advanced Economies										
Financial Account Balance	305.5	335.6	432.1	462.0	435.2	225.8	108.9	374.7	–24.2	81.9
Direct Investment, Net	244.0	2.7	–246.7	355.4	–53.3	37.5	113.4	412.5	39.8	2.8
Portfolio Investment, Net	58.8	216.7	484.6	17.5	461.1	126.0	257.4	404.0	95.6	108.2
Financial Derivatives, Net	1.8	–85.6	32.4	21.8	51.9	27.1	85.7	59.2	35.6	56.2
Other Investment, Net	–139.1	–24.5	–16.9	–177.9	–152.4	–32.5	–706.4	–1,104.4	–331.3	–216.1
Change in Reserves	140.0	226.6	178.5	244.8	127.9	67.6	358.9	602.8	135.7	130.2
United States										
Financial Account Balance	–297.1	–333.1	–363.6	–344.6	–348.4	–480.4	–653.0	–729.3	–879.5	–857.1
Direct Investment, Net	135.7	–209.4	–174.6	28.6	–344.3	–180.0	100.4	12.3	–92.3	–99.2
Portfolio Investment, Net	–114.9	–53.5	–195.0	–221.4	32.2	–190.6	–490.1	8.6	–265.6	–296.9
Financial Derivatives, Net	–54.3	–27.0	7.8	24.0	–20.4	–41.7	–5.8	–22.2	–14.5	–15.3
Other Investment, Net	–259.9	–37.0	–4.0	–174.1	–20.8	–72.7	–266.4	–838.9	–507.2	–445.8
Change in Reserves	–3.6	–6.3	2.1	–1.7	5.0	4.7	9.0	111.0	0.0	0.0
Euro Area										
Financial Account Balance	372.6	338.5	313.2	392.8	344.9	233.1	225.4	374.9	. . .	. . .
Direct Investment, Net	89.3	244.3	150.8	74.1	127.9	80.0	–172.1	344.0	. . .	. . .
Portfolio Investment, Net	87.0	133.5	529.8	402.6	272.6	–105.0	612.9	498.7	. . .	. . .
Financial Derivatives, Net	49.7	126.5	11.2	12.9	46.9	7.8	10.5	82.2	. . .	. . .
Other Investment, Net	142.2	–177.4	–395.7	–95.5	–132.4	243.3	–240.8	–704.1	. . .	. . .
Change in Reserves	4.4	11.6	17.1	–1.2	29.8	7.1	15.0	154.1	. . .	. . .
Germany										
Financial Account Balance	319.3	260.1	289.0	312.5	291.7	208.6	247.1	372.5	249.8	313.4
Direct Investment, Net	87.3	68.5	48.0	37.9	25.1	84.6	–4.0	120.5	69.9	66.8
Portfolio Investment, Net	179.9	210.5	220.0	229.6	181.2	78.0	48.9	301.9	127.9	171.3
Financial Derivatives, Net	51.2	33.7	31.7	12.6	26.8	27.5	109.9	72.2	4.3	37.7
Other Investment, Net	4.3	–50.2	–12.5	33.9	58.2	19.1	92.3	–159.8	47.6	37.6
Change in Reserves	–3.4	–2.5	1.9	–1.4	0.5	–0.6	–0.1	37.7	0.0	0.0
France										
Financial Account Balance	–10.3	–0.8	–18.6	–36.1	–28.4	–21.9	–59.9	–57.6	–51.7	–48.9
Direct Investment, Net	47.1	7.8	41.7	11.1	60.2	5.4	41.0	26.4	27.3	29.1
Portfolio Investment, Net	–23.8	43.2	0.2	30.2	19.3	–76.9	–41.5	–18.9	–18.2	–16.5
Financial Derivatives, Net	–31.7	14.5	–17.6	–1.4	–30.5	4.1	–27.2	20.6	7.0	0.3
Other Investment, Net	–2.9	–74.2	–45.4	–72.6	–89.7	42.3	–36.8	–112.7	–70.1	–65.7
Change in Reserves	1.0	8.0	2.5	–3.4	12.3	3.2	4.6	27.0	2.2	3.8
Italy										
Financial Account Balance	78.4	42.9	37.4	61.2	38.8	60.8	71.5	43.2	49.7	71.5
Direct Investment, Net	3.1	2.0	–12.3	0.5	–6.1	1.6	21.7	9.6	9.7	10.5
Portfolio Investment, Net	3.2	111.7	157.1	102.0	156.5	–58.0	123.8	151.2	–39.7	–15.1
Financial Derivatives, Net	–1.9	1.3	–3.6	–8.4	–3.3	2.9	–3.3	0.9	0.6	0.6
Other Investment, Net	75.2	–72.7	–102.5	–35.9	–111.5	110.6	–75.2	–143.1	79.0	75.6
Change in Reserves	–1.3	0.6	–1.3	3.0	3.1	3.6	4.6	24.5	0.0	0.0
Spain										
Financial Account Balance	22.8	31.8	39.2	40.0	38.3	28.3	20.2	38.2	28.6	29.2
Direct Investment, Net	14.2	33.4	12.4	14.1	–19.9	7.4	22.4	–11.4	6.5	7.1
Portfolio Investment, Net	–8.8	12.0	64.9	37.1	28.1	–53.5	90.9	35.5	14.4	14.2
Financial Derivatives, Net	1.3	4.2	2.8	8.7	–1.2	–8.5	–8.1	5.0	0.0	0.0
Other Investment, Net	10.9	–23.3	–50.1	–24.0	28.7	82.1	–84.6	–3.1	7.7	7.9
Change in Reserves	5.2	5.5	9.1	4.1	2.6	0.8	–0.4	12.2	0.0	0.0

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of US dollars)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	Projections 2023
Japan										
Financial Account Balance	58.9	180.9	266.5	168.3	183.9	227.9	128.6	98.4	114.2	138.8
Direct Investment, Net	118.7	133.3	137.5	155.0	134.6	218.5	89.5	120.1	140.6	148.6
Portfolio Investment, Net	–42.3	131.5	276.3	–50.6	92.2	87.4	37.0	–198.6	27.0	49.1
Financial Derivatives, Net	34.0	17.7	–16.1	30.4	0.9	3.2	8.4	22.3	22.3	22.3
Other Investment, Net	–60.0	–106.7	–125.6	10.0	–67.9	–106.7	–17.2	91.7	–87.3	–92.7
Change in Reserves	8.5	5.1	–5.7	23.6	24.0	25.5	10.9	62.8	11.5	11.5
United Kingdom										
Financial Account Balance	–141.6	–165.9	–159.9	–84.4	–102.9	–89.7	–56.1	–60.9	–187.4	–181.5
Direct Investment, Net	–176.1	–106.0	–297.4	46.1	–4.9	–51.6	–83.6	80.2	27.0	7.4
Portfolio Investment, Net	16.3	–231.7	–200.1	–120.1	–361.1	38.2	–17.3	–349.4	–183.1	–200.0
Financial Derivatives, Net	31.2	–128.6	29.3	13.3	11.2	11.3	39.0	–39.4	5.9	6.4
Other Investment, Net	–24.7	268.2	299.5	–32.4	227.2	–86.6	9.2	223.4	–37.1	4.7
Change in Reserves	11.7	32.2	8.8	8.8	24.8	–1.1	–3.3	24.4	0.0	0.0
Canada										
Financial Account Balance	–43.1	–51.8	–45.4	–44.2	–35.8	–38.3	–29.3	2.7	24.5	–2.2
Direct Investment, Net	1.3	23.6	33.5	53.4	20.4	29.2	23.4	30.2	34.3	33.7
Portfolio Investment, Net	–32.8	–36.2	–103.6	–74.9	3.4	–1.6	–67.8	–41.4	15.5	–17.5
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–16.9	–47.8	19.1	–23.5	–58.2	–66.0	13.8	–6.3	–25.2	–18.4
Change in Reserves	5.3	8.6	5.6	0.8	–1.5	0.1	1.3	20.2	0.0	0.0
Other Advanced Economies[1]										
Financial Account Balance	297.2	295.2	325.3	309.4	355.5	339.8	410.4	528.0	517.1	500.9
Direct Investment, Net	–6.1	–102.5	–79.7	–158.3	32.6	–43.3	64.7	–109.6	–164.2	–190.0
Portfolio Investment, Net	174.0	324.7	247.6	151.4	372.6	309.0	300.2	464.6	354.0	347.1
Financial Derivatives, Net	–22.4	–12.0	3.2	–5.6	31.9	20.0	–9.0	–18.2	–4.6	–11.4
Other Investment, Net	40.3	–90.9	3.9	108.4	–131.1	23.2	–269.2	–51.1	216.0	244.6
Change in Reserves	111.5	176.0	150.2	213.1	49.5	30.8	323.8	241.8	115.3	110.0
Emerging Market and Developing Economies										
Financial Account Balance	15.0	–300.4	–409.7	–267.4	–242.4	–131.5	63.8	233.3	734.7	474.8
Direct Investment, Net	–434.2	–344.1	–260.6	–313.0	–373.4	–363.5	–343.9	–510.6	–303.4	–370.2
Portfolio Investment, Net	–88.4	124.6	–58.3	–209.0	–101.9	–54.0	13.7	80.8	76.4	–13.7
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	412.5	480.0	389.0	66.9	106.4	112.2	279.3	153.8	394.4	354.0
Change in Reserves	95.3	–584.9	–483.2	187.2	127.8	171.2	80.9	511.4	564.6	498.8

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of US dollars)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	Projections 2023
Regional Groups										
Emerging and Developing Asia										
Financial Account Balance	153.6	72.1	–27.5	–57.8	–259.9	–54.2	152.1	70.5	176.5	152.8
Direct Investment, Net	–201.6	–139.0	–26.2	–108.5	–169.6	–144.6	–164.6	–295.9	–151.7	–158.3
Portfolio Investment, Net	–125.2	81.7	31.1	–70.1	–99.5	–72.9	–107.4	–31.2	–64.8	–106.7
Financial Derivatives, Net	0.7	0.8	–4.6	2.2	4.7	–2.6	15.8	10.4	10.8	10.9
Other Investment, Net	281.6	460.5	357.0	–80.0	–17.3	70.0	240.9	136.7	229.4	186.8
Change in Reserves	196.4	–332.7	–384.8	199.2	22.8	97.0	167.7	252.7	153.6	220.9
Emerging and Developing Europe										
Financial Account Balance	–26.2	68.6	10.3	–23.0	110.0	63.5	12.5	112.1	159.0	97.7
Direct Investment, Net	0.3	–22.1	–45.7	–28.8	–25.4	–53.3	–36.7	–28.6	11.6	–15.7
Portfolio Investment, Net	23.9	53.4	–9.4	–34.5	11.0	–1.6	20.5	36.4	60.7	47.2
Financial Derivatives, Net	5.8	5.0	0.4	–2.5	–2.8	1.4	0.0	–2.3	4.1	2.6
Other Investment, Net	66.5	40.2	29.6	26.6	79.8	23.8	32.1	–27.5	57.4	27.5
Change in Reserves	–122.7	–7.9	35.4	16.4	47.4	93.2	–3.4	134.3	25.5	36.4
Latin America and the Caribbean										
Financial Account Balance	–196.3	–187.9	–106.4	–108.9	–160.7	–120.5	2.8	–88.2	–67.2	–70.8
Direct Investment, Net	–141.1	–132.8	–124.7	–121.4	–149.0	–114.9	–89.2	–98.6	–109.2	–124.3
Portfolio Investment, Net	–108.2	–50.8	–50.5	–39.3	–14.2	1.7	1.6	–4.6	–4.7	–17.5
Financial Derivatives, Net	6.8	1.4	–2.9	3.9	4.1	4.9	5.7	0.9	3.1	3.3
Other Investment, Net	6.5	22.8	50.6	30.7	–15.4	20.7	68.3	–36.2	15.3	46.0
Change in Reserves	39.8	–31.6	18.7	13.2	11.5	–32.3	12.2	50.3	28.2	21.6
Middle East and Central Asia										
Financial Account Balance	161.8	–185.3	–220.5	–33.0	109.0	34.7	–74.8	138.6	487.7	338.9
Direct Investment, Net	–43.7	–12.4	–29.7	–16.8	–8.9	–22.1	–25.4	–20.0	–21.0	–29.1
Portfolio Investment, Net	129.7	61.8	–12.2	–41.1	5.2	28.0	85.9	35.7	76.6	60.7
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	68.1	–52.1	–38.9	88.9	79.3	21.0	–58.6	83.6	89.1	102.6
Change in Reserves	–9.2	–196.3	–148.0	–57.3	41.2	7.1	–85.6	46.8	355.9	213.2
Sub-Saharan Africa										
Financial Account Balance	–78.0	–67.7	–65.5	–44.7	–40.8	–55.0	–28.8	0.3	–21.3	–43.7
Direct Investment, Net	–48.2	–37.7	–34.3	–37.4	–20.6	–28.7	–27.9	–67.4	–33.2	–42.8
Portfolio Investment, Net	–8.6	–21.5	–17.4	–24.0	–4.5	–9.2	13.1	44.4	8.6	2.6
Financial Derivatives, Net	–1.5	–0.3	0.9	0.3	–0.6	0.3	0.7	0.0	–0.1	–0.1
Other Investment, Net	–10.2	8.6	–9.2	0.7	–19.9	–23.2	–3.4	–2.8	3.2	–8.9
Change in Reserves	–9.0	–16.5	–4.6	15.7	4.8	6.2	–10.0	27.2	1.4	6.7

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of US dollars)

	2014	2015	2016	2017	2018	2019	2020	2021	Projections 2022	Projections 2023
Analytical Groups										
By Source of Export Earnings										
Fuel										
Financial Account Balance	185.4	–181.6	–184.5	18.3	179.6	76.3	–48.3	204.2	583.8	414.2
Direct Investment, Net	–29.5	–11.5	–19.4	10.1	15.0	–6.8	–11.0	–5.4	–5.9	–10.3
Portfolio Investment, Net	137.7	67.7	–9.9	–35.5	6.5	26.6	85.6	57.4	85.2	71.7
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	94.7	–18.0	0.4	115.9	113.1	45.0	–44.7	107.0	140.1	137.1
Change in Reserves	–34.6	–233.8	–164.2	–65.8	52.5	10.2	–87.7	51.6	376.7	223.2
Nonfuel										
Financial Account Balance	–170.4	–118.8	–225.2	–285.6	–422.0	–207.8	112.1	29.1	150.9	60.6
Direct Investment, Net	–404.7	–332.6	–241.2	–323.0	–388.4	–356.7	–332.9	–505.1	–297.5	–359.9
Portfolio Investment, Net	–226.1	56.9	–48.4	–173.5	–108.4	–80.6	–71.9	23.4	–8.7	–85.4
Financial Derivatives, Net	11.8	6.8	–6.2	3.9	6.6	8.3	28.6	21.9	18.1	16.9
Other Investment, Net	317.8	498.0	388.7	–48.9	–6.7	67.2	324.0	46.9	254.3	217.0
Change in Reserves	129.9	–351.1	–319.0	253.0	75.3	160.9	168.7	459.8	188.0	275.6
By External Financing Source										
Net Debtor Economies										
Financial Account Balance	–377.7	–304.2	–268.1	–328.8	–358.0	–295.0	–94.0	–265.7	–301.6	–324.0
Direct Investment, Net	–285.2	–280.1	–292.3	–272.3	–312.0	–300.3	–251.7	–271.4	–290.9	–331.1
Portfolio Investment, Net	–211.8	–52.6	–64.4	–123.6	–35.3	–34.2	–46.7	–44.0	–9.8	–55.0
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–11.0	38.4	25.7	–32.1	–16.2	–62.2	45.0	–154.7	6.3	–21.4
Change in Reserves	120.6	–11.8	74.6	92.4	3.6	104.8	149.1	209.8	–10.3	81.7
Net Debtor Economies by Debt-Servicing Experience										
Economies with Arrears and/or Rescheduling during 2016–20										
Financial Account Balance	–46.9	–66.8	–72.2	–50.3	–40.1	–40.6	–19.4	–21.3	. . .	. . .
Direct Investment, Net	–22.9	–37.3	–28.5	–19.6	–23.7	–28.6	–21.1	–25.6	. . .	. . .
Portfolio Investment, Net	–4.5	1.0	–9.1	–28.9	–16.5	–12.8	7.5	–21.5	. . .	. . .
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–6.0	–23.4	–37.0	–10.4	–4.3	5.2	8.9	19.7	. . .	. . .
Change in Reserves	–13.2	–6.8	2.8	8.9	4.9	–3.9	–14.2	7.4	. . .	. . .
Memorandum										
World										
Financial Account Balance	320.5	35.2	22.4	194.6	192.8	94.3	172.7	608.0	710.5	556.7

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.

[1]Excludes 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		
	2004–13	2008–15	2016	2017	2018	2019	2020	2021	2022	2023	Average 2024–27
Advanced Economies											
Net Lending and Borrowing	–0.5	0.0	0.8	1.0	0.7	0.6	0.4	0.7	0.0	0.1	0.5
Current Account Balance	–0.5	0.0	0.8	1.0	0.8	0.7	0.4	0.7	–0.1	0.0	0.5
Savings	21.7	21.5	22.6	23.3	23.4	23.4	23.1	24.1	23.7	23.8	24.2
Investment	22.2	21.4	21.6	22.1	22.3	22.6	22.2	22.5	22.9	22.9	22.9
Capital Account Balance	0.0	0.0	0.0	0.0	–0.1	–0.1	0.0	0.1	0.1	0.1	0.0
United States											
Net Lending and Borrowing	–4.0	–2.8	–2.2	–1.8	–2.2	–2.2	–3.0	–3.5	–3.5	–3.2	–2.4
Current Account Balance	–4.0	–2.8	–2.1	–1.9	–2.1	–2.2	–2.9	–3.5	–3.5	–3.2	–2.4
Savings	16.9	17.2	18.9	19.5	19.6	19.4	19.2	20.0	20.6	21.2	21.8
Investment	20.9	19.8	20.6	20.8	21.1	21.4	21.2	21.4	22.1	22.5	22.4
Capital Account Balance	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Euro Area											
Net Lending and Borrowing	0.2	0.8	3.1	3.0	2.6	2.1	1.9	2.7	. . .	. . .	. . .
Current Account Balance	0.1	0.7	3.0	3.2	2.9	2.3	1.9	2.4	1.8	2.2	2.6
Savings	22.7	22.5	24.3	24.9	25.4	25.8	24.8	26.4	25.0	25.1	25.5
Investment	21.8	20.8	20.7	21.3	21.9	22.9	22.0	22.8	22.8	22.4	22.4
Capital Account Balance	0.1	0.1	0.0	–0.2	–0.3	–0.2	0.0	0.3	. . .	. . .	. . .
Germany											
Net Lending and Borrowing	5.9	6.6	8.6	7.7	8.0	7.5	6.9	7.4	5.9	6.9	7.0
Current Account Balance	5.9	6.6	8.5	7.8	7.9	7.6	7.1	7.4	5.9	6.9	7.0
Savings	26.2	26.8	28.5	28.8	29.9	29.7	28.2	30.1	28.6	28.6	28.9
Investment	20.3	20.2	20.0	21.0	21.9	22.1	21.1	22.7	22.7	21.8	21.9
Capital Account Balance	0.0	0.0	0.1	–0.1	0.0	0.0	–0.2	0.0	0.0	0.0	0.0
France											
Net Lending and Borrowing	–0.3	–0.7	–0.4	–0.8	–0.7	–0.2	–1.8	–0.5	–1.8	–1.6	–1.0
Current Account Balance	–0.3	–0.7	–0.5	–0.8	–0.8	–0.3	–1.9	–0.9	–1.8	–1.7	–1.1
Savings	22.4	21.9	22.1	22.7	23.0	24.1	21.8	24.1	23.2	23.1	23.3
Investment	22.7	22.6	22.6	23.4	23.9	24.4	23.7	25.0	25.0	24.8	24.3
Capital Account Balance	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.5	0.1	0.1	0.1
Italy											
Net Lending and Borrowing	–1.4	–0.7	2.4	2.7	2.5	3.1	3.7	3.3	2.4	3.3	3.4
Current Account Balance	–1.4	–0.8	2.6	2.6	2.5	3.2	3.7	3.3	1.8	2.4	2.8
Savings	19.0	18.1	20.2	20.6	21.1	21.5	21.5	23.3	21.8	21.8	22.1
Investment	20.4	18.9	17.6	18.1	18.5	18.2	17.7	20.0	20.0	19.4	19.2
Capital Account Balance	0.1	0.1	–0.2	0.1	0.0	–0.1	0.0	0.0	0.6	0.9	0.5
Spain											
Net Lending and Borrowing	–4.3	–1.2	3.4	3.0	2.4	2.4	1.2	1.9	2.0	1.9	1.9
Current Account Balance	–4.8	–1.7	3.2	2.8	1.9	2.1	0.8	0.9	0.3	0.4	1.3
Savings	20.1	19.2	21.9	22.2	22.4	23.0	21.5	22.4	21.5	21.8	22.3
Investment	24.9	20.9	18.8	19.4	20.5	20.9	20.7	21.5	21.2	21.4	21.0
Capital Account Balance	0.5	0.5	0.2	0.2	0.5	0.3	0.4	0.9	1.7	1.5	0.5
Japan											
Net Lending and Borrowing	2.8	2.1	3.8	4.1	3.5	3.4	2.9	2.8	2.3	2.6	3.1
Current Account Balance	2.9	2.1	4.0	4.1	3.5	3.4	3.0	2.9	2.4	2.7	3.1
Savings	27.6	26.3	28.8	29.3	29.1	29.3	28.4	28.1	27.7	27.9	28.2
Investment	24.7	24.2	24.8	25.2	25.6	25.8	25.4	25.2	25.4	25.2	25.0
Capital Account Balance	–0.1	–0.1	–0.1	–0.1	0.0	–0.1	0.0	–0.1	–0.1	–0.1	–0.1
United Kingdom											
Net Lending and Borrowing	–3.1	–3.9	–5.4	–3.7	–4.0	–2.7	–2.6	–2.7	–5.5	–4.9	–3.8
Current Account Balance	–3.1	–3.8	–5.3	–3.6	–3.9	–2.7	–2.5	–2.6	–5.5	–4.8	–3.7
Savings	13.6	12.5	12.4	14.6	14.0	15.3	14.2	14.5	12.1	12.4	13.8
Investment	16.7	16.4	17.7	18.2	17.9	18.0	16.7	17.1	17.6	17.2	17.4
Capital Account Balance	0.0	–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		
	2004–13	2008–15	2016	2017	2018	2019	2020	2021	2022	2023	Average 2024–27
Canada											
Net Lending and Borrowing	–0.9	–2.7	–3.1	–2.8	–2.4	–2.0	–1.8	0.1	1.1	–0.1	–1.3
Current Account Balance	–0.9	–2.7	–3.1	–2.8	–2.4	–2.0	–1.8	0.1	1.1	–0.1	–1.3
Savings	22.6	21.3	19.7	20.7	21.0	21.0	20.5	23.8	24.5	23.8	23.1
Investment	23.5	24.0	22.8	23.6	23.4	23.1	22.3	23.7	23.4	23.9	24.4
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 Economies[1]											
Net Lending and Borrowing	4.0	4.2	5.0	4.7	4.6	4.7	5.7	7.1	6.0	5.3	4.8
Current Account Balance	4.0	4.3	5.0	4.7	4.4	4.7	5.6	7.2	5.9	5.3	4.8
Savings	30.4	30.4	30.4	30.7	30.3	30.1	31.5	33.1	32.5	31.8	31.1
Investment	26.2	25.8	25.2	25.7	25.7	25.3	25.6	25.4	25.9	26.0	25.9
Capital Account Balance	0.0	–0.1	0.0	0.1	0.2	0.0	0.1	–0.1	0.0	0.0	0.0
Emerging Market and Developing Economies											
Net Lending and Borrowing	2.4	1.2	–0.2	0.0	–0.1	0.1	0.6	1.0	1.6	1.0	0.2
Current Account Balance	2.3	1.1	–0.3	–0.1	–0.2	0.0	0.5	0.9	1.5	0.9	0.1
Savings	32.0	32.5	31.0	31.5	32.4	32.2	32.8	33.4	34.6	34.5	34.1
Investment	30.0	31.7	31.5	31.9	32.9	32.5	32.8	32.7	33.2	33.7	34.1
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
Regional Groups											
Emerging and Developing Asia											
Net Lending and Borrowing	3.3	2.2	1.3	0.9	–0.3	0.5	1.5	1.0	0.6	0.4	0.1
Current Account Balance	3.2	2.2	1.3	0.9	–0.3	0.5	1.5	1.0	0.6	0.4	0.1
Savings	42.0	42.9	39.9	40.1	39.9	39.5	40.1	39.5	39.9	40.3	40.1
Investment	39.0	40.7	38.6	39.2	40.2	39.0	38.6	38.5	39.3	39.8	40.0
Capital Account Balance	0.1	0.1	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	–0.4	–0.4	0.1	–0.2	2.2	1.8	0.7	2.2	3.9	2.4	0.7
Current Account Balance	–0.6	–0.7	–0.3	–0.5	1.7	1.3	0.0	1.7	3.2	1.7	0.2
Savings	23.2	23.3	23.5	24.1	25.5	24.2	23.7	25.9	25.5	23.8	22.9
Investment	23.6	23.8	23.7	24.6	23.6	22.8	23.7	24.2	22.2	22.0	22.7
Capital Account Balance	0.1	0.3	0.3	0.3	0.5	0.5	0.6	0.6	0.7	0.6	0.6
Latin America and the Caribbean											
Net Lending and Borrowing	–0.6	–2.1	–2.0	–1.7	–2.6	–2.0	0.0	–1.6	–1.2	–1.2	–1.4
Current Account Balance	–0.7	–2.2	–2.0	–1.7	–2.7	–2.1	–0.2	–1.6	–1.2	–1.2	–1.4
Savings	21.0	19.6	16.6	16.3	16.5	16.8	17.1	17.9	19.7	19.7	19.8
Investment	21.7	22.0	18.3	18.3	19.2	18.9	18.0	19.7	20.5	20.7	21.1
Capital Account Balance	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Middle East and Central Asia											
Net Lending and Borrowing	9.0	6.4	–3.9	–1.1	2.7	0.5	–2.3	3.0	8.2	5.6	2.4
Current Account Balance	9.2	6.3	–4.1	–1.1	2.9	0.5	–2.5	3.0	8.3	5.6	2.4
Savings	35.9	33.8	23.5	26.1	28.9	28.1	25.9	30.6	35.6	33.1	30.3
Investment	28.2	29.1	28.9	29.3	28.4	30.2	30.6	28.7	28.1	28.3	28.5
Capital Account Balance	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Sub-Saharan Africa											
Net Lending and Borrowing	1.4	–1.4	–3.2	–1.8	–1.9	–2.8	–2.5	–0.7	–1.3	–2.1	–2.2
Current Account Balance	0.2	–2.1	–3.6	–2.2	–2.3	–3.2	–3.0	–1.1	–1.7	–2.5	–2.5
Savings	20.6	19.5	17.7	18.4	19.3	19.6	20.3	20.3	19.4	18.9	18.8
Investment	20.5	21.5	21.0	20.5	21.3	22.9	23.2	21.4	21.1	21.4	21.3
Capital Account Balance	1.2	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3

Table A14. Summary of Net Lending and Borrowing *(continued)*

(Percent of GDP)

	Averages								Projections		
	2004–13	2008–15	2016	2017	2018	2019	2020	2021	2022	2023	Average 2024–27
Analytical Groups											
By Source of Export Earnings											
Fuel											
Net Lending and Borrowing	12.0	8.0	–2.8	1.0	5.2	1.9	–2.1	4.3	10.4	7.2	3.5
Current Account Balance	12.2	8.1	–2.9	1.2	5.4	2.0	–2.3	4.4	10.6	7.3	3.5
Savings	38.6	35.1	24.2	27.1	31.6	30.8	27.8	33.8	39.4	36.3	32.2
Investment	27.9	29.0	27.6	28.4	28.6	31.5	33.5	30.6	29.1	29.4	29.2
Capital Account Balance	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Nonfuel											
Net Lending and Borrowing	0.9	0.1	0.1	–0.1	–0.7	–0.1	0.9	0.6	0.3	0.1	–0.3
Current Account Balance	0.7	0.0	0.0	–0.2	–0.8	–0.2	0.8	0.5	0.2	0.0	–0.3
Savings	30.9	32.0	31.9	32.0	32.5	32.3	33.4	33.3	33.9	34.2	34.3
Investment	30.3	32.1	32.0	32.3	33.4	32.6	32.7	32.9	33.7	34.3	34.7
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	–1.7	–2.5	–1.9	–2.0	–2.4	–1.8	–0.5	–1.7	–1.9	–1.9	–1.9
Current Account Balance	–2.0	–2.8	–2.1	–2.2	–2.7	–2.0	–0.8	–1.9	–2.1	–2.1	–2.1
Savings	23.3	23.0	22.1	22.2	22.5	22.4	22.7	22.8	23.0	23.2	23.6
Investment	25.4	25.7	24.2	24.5	25.2	24.6	23.7	24.8	25.3	25.4	25.8
Capital Account Balance	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2016–20											
Net Lending and Borrowing	–1.3	–3.6	–6.0	–5.0	–3.9	–3.9	–2.1	–2.1	. . .	. . .	. . .
Current Account Balance	–2.2	–4.3	–6.3	–5.5	–4.3	–4.2	–2.7	–2.4	. . .	. . .	. . .
Savings	21.0	19.0	15.2	16.3	17.7	16.8	14.7	15.2	. . .	. . .	. . .
Investment	23.3	23.1	21.9	22.5	22.0	21.9	18.1	17.9	. . .	. . .	. . .
Capital Account Balance	0.9	0.7	0.3	0.5	0.4	0.4	0.6	0.3	. . .	. . .	. . .
Memorandum											
World											
Net Lending and Borrowing	0.3	0.4	0.4	0.6	0.4	0.4	0.5	0.8	0.7	0.5	0.3
Current Account Balance	0.3	0.4	0.4	0.6	0.4	0.4	0.4	0.8	0.6	0.4	0.3
Savings	25.0	25.5	25.9	26.6	27.0	27.0	27.0	28.0	28.4	28.4	28.6
Investment	24.7	25.1	25.4	26.0	26.5	26.6	26.4	26.7	27.3	27.6	27.9
Capital Account Balance	0.1	0.0	0.0	0.0	0.0	0.0	0.0	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.
[1]Excludes 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			
							Averages	
	2004–13	2014–23	2020	2021	2022	2023	2020–23	2024–27
				Annual Percent Change				
World Real GDP	**4.1**	**3.0**	**–3.1**	**6.1**	**3.6**	**3.6**	**2.5**	**3.3**
Advanced Economies	1.6	1.9	–4.5	5.2	3.3	2.4	1.5	1.7
Emerging Market and Developing Economies	6.4	3.9	–2.0	6.8	3.8	4.4	3.2	4.5
Memorandum								
Potential Output								
Major Advanced Economies	1.6	1.3	–1.3	2.4	1.9	2.0	1.2	1.6
World Trade, Volume[1]	**5.4**	**3.0**	**–7.9**	**10.1**	**5.0**	**4.4**	**2.7**	**3.7**
Imports								
Advanced Economies	3.7	3.2	–8.7	9.5	6.1	4.5	2.6	3.0
Emerging Market and Developing Economies	9.1	2.8	–7.9	11.8	3.9	4.8	2.9	4.8
Exports								
Advanced Economies	4.5	2.8	–9.1	8.6	5.0	4.7	2.1	3.2
Emerging Market and Developing Economies	7.4	3.4	–4.8	12.3	4.1	3.6	3.6	4.3
Terms of Trade								
Advanced Economies	–0.4	0.3	0.8	0.7	–1.1	0.3	0.2	0.3
Emerging Market and Developing Economies	1.5	–0.4	–1.2	1.4	1.9	–1.0	0.2	–0.5
World Prices in US Dollars								
Manufactures	2.6	0.8	–3.2	6.8	8.8	2.9	3.7	1.5
Oil	13.7	–1.2	–32.7	67.3	54.7	–13.3	10.8	–5.9
Nonfuel Primary Commodities	8.4	2.2	6.8	26.8	11.4	–2.5	10.1	–0.4
Consumer Prices								
Advanced Economies	2.0	1.9	0.7	3.1	5.7	2.5	3.0	1.9
Emerging Market and Developing Economies	6.3	5.4	5.2	5.9	8.7	6.5	6.6	4.5
Interest Rates				*Percent*				
World Real Long-Term Interest Rate[2]	1.3	–0.6	–0.3	–2.5	–4.4	–0.4	–1.9	0.5
Current Account Balances				*Percent of GDP*				
Advanced Economies	–0.5	0.5	0.4	0.7	–0.1	0.0	0.3	0.5
Emerging Market and Developing Economies	2.3	0.3	0.5	0.9	1.5	0.9	0.9	0.1
Total External Debt								
Emerging Market and Developing Economies	27.5	30.1	32.6	30.7	28.1	27.2	29.7	25.8
Debt Service								
Emerging Market and Developing Economies	9.3	10.8	11.3	10.6	10.0	9.7	10.4	9.3

[1]Data refer to trade in goods and services.
[2]GDP-weighted average of 10-year (or nearest-maturity) government bond rates for Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

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IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, APRIL 2022

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 April 11, 2022.*

Executive Directors broadly agreed with staff's assessment of the global economic outlook, risks, and policy priorities. They noted that the war in Ukraine has led to a costly humanitarian crisis, with economic and financial repercussions and spillovers—through commodity markets, confidence, trade, and financial channels—that have prompted a downgrade to the global economic outlook and increased inflationary pressures at a time when the global economy has not yet recovered from the COVID-19 crisis. Directors concurred that the sharp increase in uncertainty could make economic projections especially volatile. They agreed that emerging risks—from an intensification of the war, further sanctions on Russia, fragmentation in financial and trade markets, and a sharper-than-expected slowdown in China due to COVID-19 outbreaks—on top of the continued risk of new, more virulent COVID-19 strains have further tilted the balance of risks to the downside. Moreover, Directors noted that the war in Ukraine has increased the likelihood of food shortages and wider social tensions given higher food and energy prices, which would further adversely impact the outlook.

Against this backdrop, Directors agreed that policy priorities differ across countries, reflecting local circumstances and differences in trade and financial exposures. Directors emphasized that the layering of strains—slowing economic growth, persistent and rising inflation pressures, increased food and energy insecurity, continued supply chain disruptions, and COVID-19 flare-ups—further complicates national policy choices, particularly for countries where policy space shrank after the necessary response to the COVID-19 pandemic. At the global level, Directors stressed that multilateral cooperation and dialogue remain essential to defuse geopolitical tensions and avoid fragmentation, end the pandemic, and respond to the myriad challenges facing our interconnected world, particularly climate change.

Directors concurred that, in many countries, fiscal policy is operating in a highly uncertain environment of elevated inflation, slowdown in growth, high debt, and tightening borrowing conditions. While acknowledging that fiscal policy has a role to play in moments of large adverse shocks, Directors considered that, particularly for countries with tighter budget constraints, fiscal support should focus on priority areas and target the most vulnerable. They emphasized that, in countries where economic growth is strong and where inflation is elevated, fiscal policy should phase out pandemic-related exceptional support, moving toward normalization. Directors acknowledged that many emerging markets and low-income countries face difficult choices given limited fiscal space and higher demands on governments due to energy disruptions and the pressing need to ensure food security. In this context, they underscored that a sound and credible medium-term fiscal framework, including spending prioritization and measures to raise revenues, can help manage urgent needs while ensuring debt sustainability. Directors stressed that short-term measures to mitigate high food and energy prices should not undermine actions to ensure greater resilience through investment in health, food, and cleaner energy sources.

Directors concurred that monetary authorities should act decisively to prevent inflationary pressures from becoming entrenched and avoid a de-anchoring of inflation expectations. They noted that central banks in many advanced and emerging market economies need to continue tightening the monetary policy stance to bring inflation credibly back to target and preserve hard-built policy credibility. Directors stressed that transparent, data-driven, and clearly communicated monetary policy is critical to avoid financial instability. They considered that, should global financial

conditions tighten suddenly, emerging and developing economies could face capital outflows and should be ready to use all available tools, including foreign exchange interventions and capital flow management measures, when needed and in line with the Fund's Institutional View on the Liberalization and Management of Capital Flows and without substituting for exchange rate flexibility and warranted macroeconomic adjustments.

Directors agreed that the war in Ukraine will test the resiliency of the financial system. They noted that, although no systemic event has materialized so far, financial stability risks have risen along many dimensions while global financial conditions have tightened significantly. Directors concurred that, in those emerging markets where the sovereign-bank nexus could pose vulnerabilities, it should be closely monitored. They also noted risks of fragmentation of capital markets and payment systems, the creation of blocks of central bank digital currencies, a more widespread use of crypto assets, and more frequent cyberattacks. Directors recommended tightening selected macroprudential tools to tackle pockets of elevated vulnerabilities while avoiding procyclicality and a disorderly tightening of financial conditions. They also called for comprehensive global standards and a multifaceted strategy for crypto assets and for a more robust oversight of fintech firms and decentralized finance platforms.

Directors agreed that strong multilateral cooperation is essential to respond to existing and unfolding humanitarian crises, safeguard global liquidity, manage debt distress, ensure food security, mitigate and adapt to climate change, and end the pandemic. Noting that many countries are coping with higher volatility, increased spending from the pandemic and humanitarian crises, and tightening financial conditions, Directors called on the Fund and other multilateral institutions to stand ready to provide financial support. At the same time, they noted that prompt and orderly debt restructuring, particularly by improving the G20 Common Framework, will be necessary in cases where liquidity support is insufficient. Directors noted that increasingly dire climate change developments heighten the urgency for tangibly advancing the green economic transformation. They stressed the importance of intensifying efforts to implement the COP26 roadmap together with appropriate measures to address energy security concerns. Directors considered that international cooperation in corporate taxation and carbon pricing could also help mobilize resources to promote the necessary investments and reduce inequality. As the pandemic persists, Directors underscored that prompt, equitable, and wider access to vaccinations, testing, and treatments remains a key priority. They also reiterated that measures to address the scars from the pandemic remain crucial to boost long-term prospects and create a more resilient and inclusive global economy. Above all, Directors called for a peaceful resolution of the war in Ukraine, an end to the resulting humanitarian crisis, and a return to the rules-based international order that helped lift millions out of poverty over the past decades.

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