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FISCAL MONITOR

Climate Crossroads:
Fiscal Policies in a Warming World

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CONTENTS

Assumptions and Conventions	v
Further Information	vi
Preface	vii
Foreword	viii
Executive Summary	x
Chapter 1. Climate Crossroads: Fiscal Policies in a Warming World	1
Introduction	1
Are Current Policies Scalable on the Road to Net Zero?	2
Designing Efficient and Fiscally Responsible Policies	6
Debt Impact of Climate Policy Packages	12
Facilitating Green Transition in Firms	16
Conclusion	19
Box 1.1. GDP Impact of Climate Mitigation Policies	20
Box 1.2. The Energy Transition of Fossil Fuel-Exporting Countries	21
Box 1.3. How Have Firms Responded to Recent Energy Price Shocks?	23
References	25
Economy Abbreviations	29
Glossary	31
Methodological and Statistical Appendix	35
Data and Conventions	35
Fiscal Policy Assumptions	38
Definition and Coverage of Fiscal Data	43
Table A. Economy Groupings	43
Table B. Advanced Economies: Definition and Coverage of <i>Fiscal Monitor</i> Data	47
Table C. Emerging Market and Middle-Income Economies: Definition and Coverage of <i>Fiscal Monitor</i> Data	48
Table D. Low-Income Developing Countries: Definition and Coverage of <i>Fiscal Monitor</i> Data	49
List of Tables	
Advanced Economies (A1–A8)	50
Emerging Market and Middle-Income Economies (A9–A16)	58
Low-Income Developing Countries (A17–A22)	66
Structural Fiscal Indicators (A23–A25)	72
Selected Topics	75
IMF Executive Board Discussion of the Outlook, September 2023	87

Figures

Figure 1.1. Annual Global Greenhouse Gas Emissions, 1990–2050	2
Figure 1.2. The Green Transition Brings Close Interactions among Fiscal Policies, Climate, and Macroeconomy	2
Figure 1.3. Impacts of Current Policies, Relative to No Climate Policies, on Carbon Dioxide Levels in 2030	3
Figure 1.4. Historic and Projected Public Debt and Primary Balance, 2019–28	4
Figure 1.5. Illustrative Debt Dynamics When Expenditure-Based Climate Policies Are Expanded	5
Figure 1.6. Annual Investment Needs for Climate Adaptation and Sustainable Development Goals, 2021–40	5
Figure 1.7. Climate Crossroads—Tackling the Climate Change Trilemma	6
Figure 1.8. Explicit National, Subnational, and Regional Carbon-Pricing Schemes, 2022	7
Figure 1.9. Effects of Feebates for New Vehicles, 2021	9
Figure 1.10. Change in Domestic Iron and Steel and Cement Production Costs from Baseline, 2030	10
Figure 1.11. Learning Curves for Power Generation, by Technologies	11
Figure 1.12. Implications of Net-Zero-Policy Packages on Debt and Primary Balance, Relative to “Business-as-Usual” Baseline, by Fiscal Component	13
Figure 1.13. Impact of Technology Spillovers and Investment Bottlenecks on Debt Dynamics	15
Figure 1.14. Costs of Delay in Raising Carbon Prices	15
Figure 1.15. Likelihood of Investing in Mitigation: New, Less-Polluting Technology	17
Figure 1.16. Environmental Policy Stringency and Changes in European Firms’ Investment	17
Figure 1.17. Firms’ Plans for Utilizing Incentives of Recent Climate Policy Packages in United States and Germany, Spring 2023	18
Figure 1.18. Firms’ Responses to Financial Incentives to Invest in Emission Reduction, Spring 2023	18
Figure 1.1.1. Meta-analysis: GDP Impact after Five Years	20
Figure 1.1.2. Impact of Carbon Prices at \$40 a Ton on Real GDP for EU Countries, 1990–2019	20
Figure 1.2.1. High Dependence on Commodity Revenues and Exports for Fossil Fuel-Exporting Countries	21
Figure 1.2.2. Fiscal Revenues for Select Fossil Fuel Producers under Various Energy Transition Scenarios	22
Figure 1.3.1. Firms Experiencing Energy Price Shocks, 2022	23
Figure 1.3.2. Impact of Rise in Energy Cost on Firms’ Performance and Investment	23

Tables

Table 1.1. Comparison of Mitigation Instruments	8
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Online-Only Annexes

Online Annex 1.1. Mitigation Targets for Paris Agreement, Policies, and Sector Targets for G20 Economies
Online Annex 1.2. Macro-Fiscal Implications of Climate Policies
Online Annex 1.3. Charging per Vehicle Kilometer Traveled
Online Annex 1.4. Applications of Feebates
Online Annex 1.5. The Solar Photovoltaic Experience
Online Annex 1.6. Intergenerational Impact of Climate Policies
Online Annex 1.7. Public Financial Management
Online Annex 1.8. Government Policies Shape Firm Investment in Climate
Online Annex 1.9. Surveys on Firms’ Responses to Energy Price Spikes and Recent Climate Policy Packages
Online Annex 1.10. GDP Impacts from Carbon Pricing

ASSUMPTIONS AND CONVENTIONS

The following symbols have been used throughout this publication:

- . . . to indicate that data are not available
- to indicate that the figure is zero or less than half the final digit shown, or that the item does not exist
- between years or months (for example, 2008–09 or January–June) to indicate the years or months covered, including the beginning and ending years or months
- / between years (for example, 2008/09) to indicate a fiscal or financial year

“Billion” means a thousand million; “trillion” means a thousand billion.

“Basis points” refers to hundredths of 1 percentage point (for example, 25 basis points are equivalent to $\frac{1}{4}$ of 1 percentage point).

“n.a.” means “not applicable.”

Minor discrepancies between sums of constituent figures and totals are due to rounding.

As used in this publication, the term “country” does 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

Corrections and Revisions

The data and analysis appearing in the *Fiscal Monitor* are compiled by IMF staff at the time of publication. Every effort is made to ensure their timeliness, accuracy, and completeness. When errors are discovered, corrections and revisions are incorporated into the digital editions available from the IMF website and on the IMF eLibrary. All substantive changes are listed in the Table of Contents of the online PDF of the report.

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PREFACE

The projections included in this issue of the *Fiscal Monitor* are drawn from the same database used for the October 2023 *World Economic Outlook* and *Global Financial Stability Report* (and are referred to as “IMF staff projections”). Fiscal projections refer to the general government, unless otherwise indicated. Short-term projections are based on officially announced budgets, adjusted for differences between the national authorities and the IMF staff regarding macroeconomic assumptions. The fiscal projections incorporate policy measures that are judged by the IMF staff as likely to be implemented. For countries supported by an IMF arrangement, the projections are those under the arrangement. In cases in which the IMF staff has insufficient information to assess the authorities’ budget intentions and prospects for policy implementation, an unchanged cyclically adjusted primary balance is assumed, unless indicated otherwise. Details on the composition of the groups, as well as country-specific assumptions, can be found in the Methodological and Statistical Appendix of the October 2023 *Fiscal Monitor*.

The *Fiscal Monitor* is prepared by the IMF Fiscal Affairs Department under the general guidance of Vitor Gaspar, Director of the Department. The project was directed by Ruud de Mooij, Deputy Director, and Era Dabla-Norris, Assistant Director. The main authors of Chapter 1 in this issue are W. Raphael Lam (team lead) and Christine Richmond (team lead), David Amaglobeli, Simon Black, Yongquan Cao, Ximing Dong, Daniel Garcia-Macia, Christophe Hemous, Samir Jahan, Pedro Juarros, Salma Khalid, Korlai Kirabaeva, Antung Anthony Liu, Emanuele Massetti, Diego Mesa Puyo, Danielle Minnett, Anh Nguyen, Sandeep Saxena, Sunalika Singh, Alexandra Solovyeva, Nate Vernon, Chenlu Zhang, and Karlygash Zhunussova, with contributions from Fotios Kalantzis (European Investment Bank), Brent Meyer (Federal Reserve Bank of Atlanta), Xuguang Simon Sheng (American University), Pawel Smietanka (Deutsche Bundesbank), Sonya Waddell (Federal Reserve Bank of Richmond), Daniel Weitz (Federal Reserve Bank of Atlanta), and Marcin Wolski (European Investment Bank).

The Methodological and Statistical Appendix was prepared by Zhonghao Wei under the guidance of Xuehui Han. Jiae Yoo provided excellent communications support. Meron Haile and Andre Vasquez provided excellent coordination and editorial support. Wala’a El Barasse from the Communications Department led the editorial team and managed the report’s production, with editorial and production support from Michael Harrup, Katy Whipple, Linda Long, and Absolute Service, Inc. Fabio Bolzan, Thanayi Jwahir, Jinsol Kim, and Felipe Leon from the Corporate Services and Facilities Department provided excellent support to the infographics.

Inputs, comments, and suggestions were received from other departments in the IMF, including area departments—namely, the African Department, Asia and Pacific Department, European Department, Middle East and Central Asia Department, and Western Hemisphere Department—as well as the Communications Department, Institute for Capacity Development, Legal Department, Monetary and Capital Markets Department, Research Department, Secretary’s Department, Statistics Department, and Strategy, Policy, and Review Department. Chapter 1 of the *Fiscal Monitor* also benefited from comments by Joe Aldy (Harvard University), Scott Barrett (Columbia University), Dora Benedek (IMF), Stefano Carattini (Georgia State University), Kelly Clark (University of California, Los Angeles), Carolyn Fischer (World Bank), Stephie Fried (Federal Reserve Bank of San Francisco), Larry Goulder (Stanford University), Stephane Hallegatte (World Bank), Felix Kubler (University of Zurich), Neil Mehrotra (Federal Reserve Bank of Minneapolis), Debora Revoltella (European Investment Bank), James Roaf (IMF), Thomas Sterner (University of Gothenburg), David Victor (University of California, San Diego), and participants of the IMF workshop on “Designing Fiscal Policies on the Road to Net Zero” in July 2023. Both projections and policy considerations are those of the IMF staff and should not be attributed to Executive Directors or to their national authorities.

FOREWORD

For all countries, it is becoming hard to balance public finances. The difficulties originate in ever-growing demand for public spending, associated with high expectations about what the state can and should do, elevated debts, and high-for-long interest rates and political red lines on taxes. But the way the government budget constraint binds varies widely across countries. In some cases, it is binding with the government having insufficient resources to pay urgent bills and no access to market financing. These countries are often small and poor. For example, in many low-income countries interest expenses represent a large and growing fraction of tax revenues. In other cases, while immediate financial pressures are absent, the perpetuation of current policies entails an unsustainable fiscal path. These countries are, in general, large and rich. In addition, there is another important consideration when pondering budgetary policies. In most countries, tighter fiscal policies are needed, not only to reconstitute buffers and contain public finance risks, but also to contribute to central banks' efforts in favor of a timely return to inflation targets.

Debts are generally elevated around the world, and borrowing costs are rising. Global public debt is expected to turn up in 2023. Why? It would be accurate to answer that the rising trend is due to the major global economies (including the United States and China). Indeed, world debt is projected to increase by about 1 percentage point of GDP per year over the medium term. But, excluding the two largest economies, the ratio would instead decline by about ½ percentage point annually. Nevertheless, it would be more *relevant* to state that the turning up of deficits reflects slowing growth, rising real interest rates, and budget deficits dipping further into the red. The bottom line is that global public debt is now substantially higher, and it is projected to grow considerably faster than in pre-pandemic projections. At the projected pace, the global public debt ratio would be approaching 100 percent of GDP by the end of the decade.

The *Fiscal Monitor* looks at the fiscal implications from the green transition. The baseline is business

as usual. Under such an assumption, it is possible to identify *ambition* gaps—the difference between countries' own nationally defined contributions and what is required to deliver on the Paris Agreement goals—and *policy* gaps—the difference between the national targets and the outcomes achievable under “business-as-usual” conditions. In sum, the baseline scenario fails to deliver net zero, with catastrophic consequences. Our report shows that scaling up the current policy mix—heavy on subsidies and other components of public spending—to deliver net zero leads to an accumulation of public debt by 40–50 percentage points of GDP for a representative advanced economy and for a representative emerging market economy by 2050.

The *Fiscal Monitor* argues that to partially circumvent this terrible trade-off, it is necessary to rely on a combination of policy instruments. Carbon pricing is a necessary component of the policy mix, but it is not sufficient. It must be complemented by instruments aimed at correcting remaining market failures. Fiscal support is also necessary to facilitate the unavoidable costly adjustments required of vulnerable households, workers, communities, and corporations. *Climate Crossroads: Fiscal Policies in a Warming World* presents illustrative combinations of policies that limit the increase in the public debt ratio to the range of 10–15 percentage points of GDP by 2050. That is a pressure that looks manageable through the adjustment of other parts of the budget.

Countries with limited fiscal space, low tax capacity, and expensive or nonexistent access to market financing face large adaptation costs. In many cases, these countries also have to deal with financial difficulties in their efforts to pursue sustainable, inclusive, and resilient development. These countries should prioritize and target spending (for example, eliminating fuel subsidies). They should also intensify their efforts to improve tax capacity with special emphasis on institutional building and enlarging tax bases (see IMF Staff Discussion Note “Building Tax Capacity in Developing Countries”).

The private sector has a crucial role to play in a successful green transition. Public policies should provide a framework that favors private sector participation in investment and financing. In 2021 and 2022, the IMF has supported the efforts in more than 150 member states to upgrade tax capacity and to strengthen the market for Treasury liabilities. See the October 2023 *Global Financial Stability Report* for an overview on climate finance.

Ahead of the Conference of the Parties 28, it is important to reiterate that a global pragmatic side agreement among large players—such as the United States, China, India, the European Union, and the African Union—could make a decisive contribution. By incorporating a carbon price floor, the global agreement would provide the most effective and efficient policy instrument to become a focal point for policy action in the world. By including financial and technological transfers and revenue-sharing mechanisms, it could ease the financial divide and contribute to the achievement of the United Nation’s Sustainable Development Goals, including the eradication of poverty and hunger.

The IMF has an important role to play at the center of the international monetary system, to help preserve sound public finances and financial stability. It is an essential piece of the global safety net. Urgent support from members is necessary to increase quota resources and secure funding for the concessional Poverty Reduction and Growth Trust and the Resilience and Sustainability Trust.

The logic of the three-way policy trade-off—or policy trilemma—described in the first lines of this foreword applies beyond climate. In fact, it applies to any policy goal that implies additional budget spending. Faced with myriad spending pressures, political red lines limiting taxation, at an insufficient level, translate directly into larger deficits that push debt to ever-rising heights.

Something must give to balance the fiscal equation. Policy ambitions may be scaled down or political red lines on taxation moved if financial stability is to prevail. The *Fiscal Monitor* shows that a smart policy mix maps the way out of the trilemma.

Vitor Gaspar
Director of the Fiscal Affairs Department

EXECUTIVE SUMMARY

Global warming threatens the planet and human livelihoods, with 2023 set to become the warmest year on record. Recognizing the threat, countries have set climate goals—for example, many countries have committed to reducing greenhouse gas emissions to net zero by midcentury—and have taken a range of policy actions. However, current and announced policies will fall short of achieving the 2015 Paris Agreement’s temperature goals. Containing global warming will ultimately benefit everyone by mitigating the potential catastrophic consequences of climate change. However, it necessitates a radical economic transformation that could impose costs and benefits unevenly across people, firms, regions, and countries. With private financing playing a decisive role, the transition to low-carbon energy sources will require strong complementarities between public and private actors.

Relying on Spending Measures Will Be Costly

Many countries are facing high debt, rising interest rates, and weaker growth prospects. Debt-to-GDP ratios are projected to rise by 1 percentage point a year globally during 2023–28, faster than foreseen before the pandemic. These headwinds complicate efforts to tackle climate change.

Several economies are pursuing emission reduction policies that rely heavily on spending measures, such as increasing public investment and subsidies for renewable energy. Policies to reduce emissions are welcome efforts. Yet, in some cases, they entail large fiscal costs. Policymakers thus face a fundamental trade-off: On the one hand, relying mostly on spending-based measures to reach net zero goals by midcentury will become increasingly costly, possibly raising public debt by 45–50 percent of GDP for a representative large-emitting country, putting debt on an unsustainable path. On the other hand, limited climate action would leave the world exposed to adverse consequences from global warming. Macroeconomic risks would concomitantly rise. The trade-off can be relaxed by the use of carbon pricing, which is cost-effective in reducing emissions while

also generating revenues to relieve the debt burden. However, carbon pricing is often unpopular, thus transforming the trade-off into a trilemma between achieving climate goals, fiscal sustainability, and political feasibility.

Such challenges are stark for emerging market and developing economies given their growth and development priorities. These economies also need to adapt to the consequences of climate change, adding to the already-sizable investment needs to meet the Sustainable Development Goals. They also have limited access to low-carbon technologies, even though existing technologies can enable countries to achieve about 90 percent of the emission cuts required by 2030 to meet the temperature goals. Fossil fuel-producing countries will also see sharp declines in commodity revenues if the world gets on track to achieving net zero emissions, presenting substantial challenges for public finances and economic diversification.

A Cleaner Future Is Possible with the Right Policies in Place

No single policy measure on its own can fully deliver on climate goals. The chapter presents a practical mix of policies accounting for their economic efficiency, administrative practicality, and political feasibility, among other attributes. From a macro-fiscal perspective, while policies should be tailored to country circumstances, carbon pricing should be an integral part of the policy mix. Although carbon pricing is necessary, it is not sufficient and should be complemented by other mitigation instruments—such as feebates, green subsidies, and regulation standards, among others—to promote innovation and deployment of low-carbon technologies and address market failures and network externalities. Fiscal transfers to vulnerable workers, families, and communities can help address concerns from higher energy prices. Successful experiences from countries at various stages of development show that this approach can help mitigate political hurdles associated with carbon pricing. These insights stand to benefit not

only the nearly 50 countries already with carbon pricing schemes in place (that will require further increases) but also the more than 23 countries currently contemplating their introduction.

Fiscal costs vary depending on the mix of revenue and spending policies. Analyses show that an appropriate mix and sequencing of revenue- and spending-based climate measures enacted now can help limit the fiscal costs of delivering the necessary emission reductions. In an indicative scenario, public debt in advanced economies would rise by 10–15 percent of GDP by 2050 (equivalent to an increase of primary deficits by 0.4 percentage point of GDP a year, on average, through 2050). Advanced economies with ample fiscal space could likely accommodate such a policy mix. Others with less fiscal space will need to prioritize spending (such as removing fossil fuel subsidies) and raise revenues to maintain debt sustainability. In either case, delayed action on carbon pricing would be very costly. Each year of delay is estimated to contribute an additional 0.8–2.0 percent of GDP a year to public debt.

Emerging market economies make up a notable share of global emissions. The expected increase in debt from a package of climate policies is estimated to be similar to advanced economies, at about 15 percent of GDP by 2050. The debt estimates are subject to large uncertainty, reflecting differences in investment and subsidies, compensation to households, fiscal space, and dependence on fossil fuels. The composition of the debt impact is notably different from advanced economies on account of higher mitigation investment needs, larger carbon revenue potential, and higher borrowing costs that are sensitive to debt. An increase in debt will be particularly challenging for emerging market and developing economies already experiencing high debt and rising interest costs, alongside sizable adaptation needs. These findings reinforce the need for improved expenditure efficiency, revenue mobilization, a greater role for private sector financing, and external financial support alongside knowledge transfers and diffusion

of established low-carbon technologies. The IMF can also help by providing long-term financing under the Resilience and Sustainability Trust. Large uncertainty—arising from policy impacts and nonlinear impacts of climate change—suggests that incorporating climate action in debt sustainability analyses is crucial.

Governments Need to Facilitate the Green Transition for Firms

Firms play a crucial role in decarbonization efforts, and governments need to encourage firms to make the necessary transformation to a low-carbon future. In this regard, firm-level analysis indicates that regulations mandating firms to set or monitor emission targets are often associated with higher firm investment in low-carbon technologies. The surge in energy prices in 2022 has shown that firms are able to invest in energy efficiency and reduce energy consumption when confronted with large energy price shocks, suggesting that regulations, incentives, and carbon pricing schemes can accelerate firm decarbonization efforts.

Fiscal incentives (via tax credits or subsidies) can boost firm investment in low-carbon technologies, especially when firms feel confident about the impact of policies on their investment plans. Domestic policies therefore need to be well communicated to firms, including their horizon, coverage, and criteria for eligibility. Targeting fiscal incentives can help minimize their fiscal costs, as some firms will invest even without government support. This shows that both policy design and implementation matter. Green subsidies must be consistent with World Trade Organization rules to avoid unintended distortions to trade and a subsidy race across nations.

Climate change is a shared responsibility. No single country is able to solve it alone. Policymakers must accelerate and coordinate their efforts on all fronts to ensure a sustainable and resilient world for future generations.

Introduction

The world is warming. The year 2023 is turning out to become the warmest one on record. According to the World Meteorological Organization, temperatures are likely to increase by more than 1.5 degrees Celsius (°C) above preindustrial levels within the coming five years. The Intergovernmental Panel on Climate Change predicts that under current trends, temperatures could increase by 3°C or more, relative to preindustrial levels, by 2100.¹ Such increases will have detrimental effects on lives and livelihoods through increased morbidity and mortality due to more prevalent infectious diseases and natural disasters; lower productivity in agriculture, fishing, and work exposed to extreme temperature conditions; and more frequent disruptions from extreme weather events and rising sea levels. The likelihood of climatic “tipping points”—such as the melting of glaciers and ice caps—increases with greater warming, bringing potential catastrophic consequences for life on the planet (IPCC 2021; Georgieva 2022; McKay and others 2022; Ditlevsen and Ditlevsen 2023).

Countries have recognized the need for urgent action to address global warming. In the 2015 Paris Agreement, they agreed to “hold the increase in the global average temperature to well below 2°C above preindustrial levels” and ideally to 1.5°C to avert catastrophic outcomes. Countries have also committed to longer-term targets for net zero emissions—cutting greenhouse gas emissions released into the atmosphere to as close to zero as possible, with the remaining emissions captured and stored—by about midcentury. Despite progress, large gaps in ambition and implementation exist (Figure 1.1).

Achieving temperature goals will require a fundamental transformation of consumption, production, and investment by households, firms, and governments over the coming years. Investment and innovation in green sectors, processes, and products, along with behavioral changes, should decrease emissions but will come at the expense of existing

brown activities (Aghion and Howitt 2005; Stern and Valero 2021), creating new opportunities and risks (Mercure and others 2018; Gourinchas, Schwerhoff, and Spilimbergo 2023).

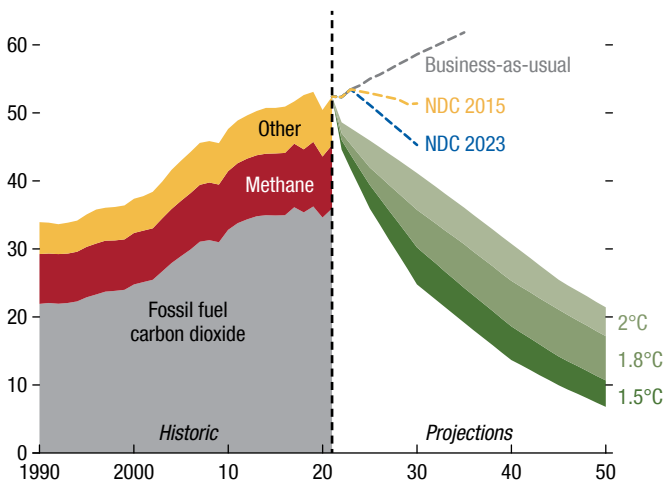
Fiscal policies will play a central role in such a transformation, including by creating a larger role for private sector financing (October 2023 *Global Financial Stability Report*, Chapter 3). A key question is how governments can encourage firms and households to decarbonize, through spending, taxation, or regulation or a combination of the three (Figure 1.2). The impact on public finances hinges critically on the decarbonization actions by firms and households as well as their responses to policies. A push for energy security is prompting countries to pursue a faster, but likely more bumpy, green transition (that is, a transition to low carbon energy and building resilience against climate risks), raising concerns that firms may not be ready to face the resulting higher energy costs. At the same time, fiscal policies will play a key role in mitigating the cost of transition for households and firms and guiding private sector decisions. Many countries—notably low-income countries and small developing states—have multiple competing development needs alongside the imperative to adapt to climate change, suggesting scope for global cooperation. Fiscal interventions in all these areas will need to respect government budget constraints. Assessing the fiscal implications of policies to achieve climate objectives is particularly pertinent at this juncture, as many countries are facing elevated debt levels, high inflation, and weak growth prospects. Rising geopolitical fragmentation also poses risks to cross-border climate technology diffusion (October 2023 *World Economic Outlook*, Chapter 3).

Against this background, this chapter addresses the following questions:

- *Can countries rely mostly on spending-based climate policies to achieve net zero emissions?*
- *How can policymakers design politically acceptable climate policies in a cost-effective and fiscally sustainable way?*
- *How can governments facilitate the green transition among firms?*

¹The panel’s central estimates under the “SSP2-4.5” scenario have a range for the increase as 2.1–3.5°C.

Figure 1.1. Annual Global Greenhouse Gas Emissions, 1990–2050
(Billions of tons of carbon dioxide emissions equivalence)



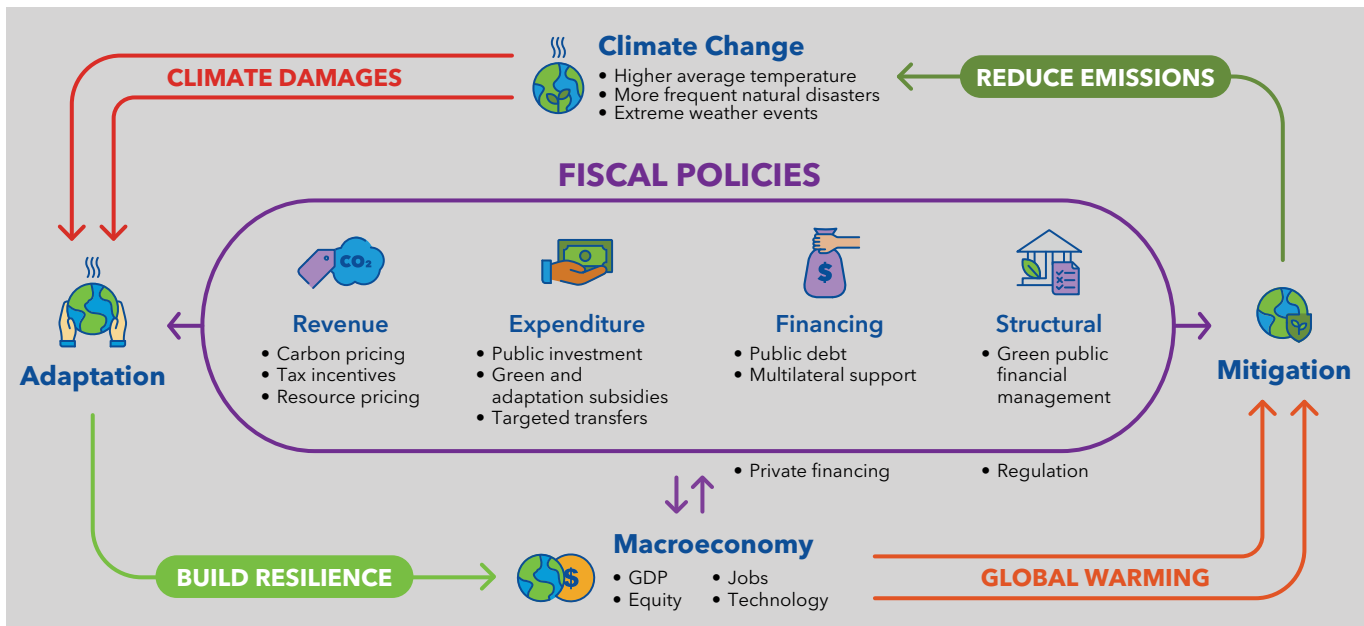
Sources: Intergovernmental Panel on Climate Change; Black, Parry, and Zhunussova 2023; and IMF staff estimates.
Note: The figure shows estimates from projection using the IMF–World Bank Climate Policy Assessment Tool. °C = degrees Celsius; NDC = nationally determined contribution.

The main contributions of the chapter include (1) conducting granular analyses to illustrate and quantify the fiscal impact and public debt implications across country groups during the green transition; (2) assessing the evolving optimal mix of climate instruments from a macrofiscal perspective in light of their cost-effectiveness, political acceptability, and other attributes; and (3) examining interactions among public incentives, green investment, and adoption of technologies by firms based on microlevel analyses, strengthening the case for using a mix of fiscal instruments. While the chapter focuses on domestic policies, it also highlights the role of international coordination in mitigation policies.

Are Current Policies Scalable on the Road to Net Zero?

Despite country efforts to meet their national climate goals, estimates using the IMF–World Bank Climate Policy Assessment Tool put the combined reduction in emissions as a result of existing and planned mitigation policies, relative to a baseline for 2030 without such policies, at 13 percent across the

Figure 1.2. The Green Transition Brings Close Interactions among Fiscal Policies, Climate, and Macroeconomy



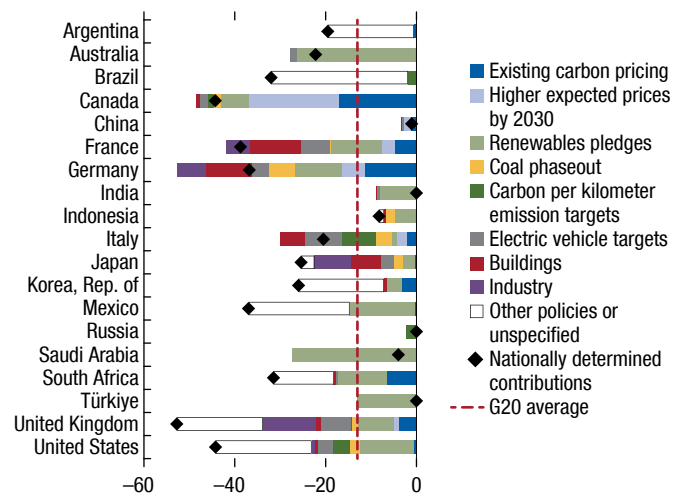
Source: IMF staff compilations.
Note: The green transition involves reducing greenhouse gas emissions and building resilience against climate risks. Economic activity emits greenhouse gases, leading to environmental damages, which could pose adverse economic impact. Mitigation policies aim to reduce emissions, while adaptation policies enhance resilience for countries to limit the disruptions to the economy. These point to intertwined linkages between fiscal policies, the macroeconomy, and climate outcomes.

Group of Twenty (Figure 1.3).² This falls significantly short of the 25–50 percent reduction by 2030 needed to achieve the Paris Agreement’s temperature goals (Black, Parry, and Zhunussova 2023). The largest emitters, including *China*, the *European Union*, *India*, and the *United States*, together account for more than 60 percent of global emissions by 2030. The share of emerging market economies is expected to reach almost 70 percent by 2035, signifying their importance for global mitigation efforts.

Countries have pursued different policy mixes to curb emissions to date. An increasing number of countries have put an explicit carbon price on greenhouse gas emissions, but their carbon-pricing schemes cover only one-quarter of global emissions, and the average price is \$20 a ton—well below the level of coverage and price needed to achieve net zero goals (IEA 2021; Black and others 2022a). Instead of raising prices on carbon emissions, some large economies have adopted policy packages that largely rely on spending-based measures such as investments in green infrastructure, public funding for investments in clean energy, and green subsidies (or tax expenditures) to provide incentives for private investment and adoption of low-carbon technologies. For example, the Inflation Reduction Act of 2022 represents the largest federal policy to date in the *United States* (costing nearly \$400 billion over 10 years) to tackle climate change and envisages higher investment in clean energy and electric vehicles (Bistline, Mehrotra, and Wolfram 2023). Rapid deployment of clean energy-generating capacity and achieving the full potential of the Inflation Reduction Act will hinge on overcoming real-world challenges, such as delays in permitting and electricity transmission siting. The *European Union* has supplemented its carbon-pricing approach by proposing a Green Deal Industrial Plan comprising tax breaks and relaxation of state aid (subsidy) rules in the coming years to boost renewable investment by

²The IMF–World Bank Climate Policy Assessment Tool is a spreadsheet-based model that helps policymakers assess, design, and implement climate mitigation policies, allowing them to estimate the effects of such policies for more than 200 countries. It includes impacts on energy demand and prices, emissions of carbon dioxide and other greenhouse gases, fiscal revenues, GDP, and welfare, as well as distributional impacts on households and industries and development co-benefits like health benefits from reductions in local air pollution and road accidents. See Black and others (2023b) for details.

Figure 1.3. Impacts of Current Policies, Relative to No Climate Policies, on Carbon Dioxide Levels in 2030
(Percent reduction relative to no climate policies)



Source: IMF staff estimates using the IMF–World Bank Climate Policy Assessment Tool (see Online Annex 1.1).

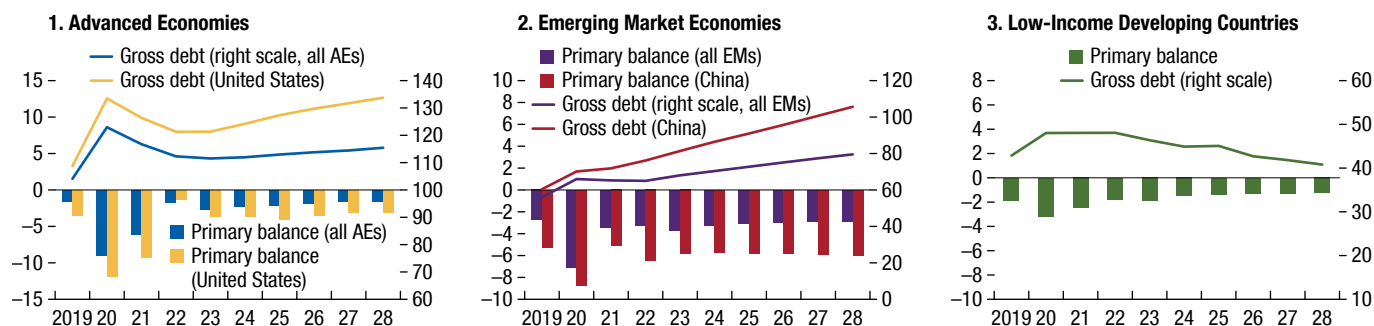
Note: “Other policies or unspecified” includes policies not quantified here or not yet specified by national authorities. The no-climate-policy counterfactual implies that countries would stop any existing carbon pricing. The figure includes estimates of emission reductions from the power and industry sectors under the US Inflation Reduction Act. G20 = Group of Twenty.

the private sector. *China* has scaled up green public investment and subsidized the deployment of solar energy over the last decade under its Made in China 2025 initiative. Some countries also have targets to reduce energy use in buildings (*France*, *Germany*, *Italy*, *Japan*), while others have set regulations for new buildings to have net zero emissions by 2030 (*Canada*, *Korea*, *South Africa*, *United States*) (Online Annex 1.1).

These policies contribute toward reducing emissions and some are necessary to achieve specific targets, although they are not always cost-effective. For example, the carbon price equivalent for the sectoral policies shown in Figure 1.3 varies significantly, implying countries could have achieved the same mitigation goal at lower cost (Black and others 2022b).

Estimates by the International Energy Agency suggest that achieving net zero emissions by 2050 will require an additional global investment in mitigation of \$2 trillion to \$2.5 trillion over the next decade. Partly because of the substantial government budget constraints (discussed in the remainder of the chapter), private investment in low-carbon technologies—working in tandem with governments through fiscal incentives and regulatory measures—will need to account for the lion’s share of this investment.

Figure 1.4. Historic and Projected Public Debt and Primary Balance, 2019–28
(Percent of GDP)



Source: IMF, World Economic Outlook database.

Note: AEs = advanced economies; EMs = emerging markets.

Elevated public debt levels across most countries are complicating climate challenges at the current juncture. Following a decline in 2021–22, global public debt ratios are projected to rise again in 2023 and to continue to increase by 1 percentage point a year over the medium term, growing faster than foreseen before the pandemic (Figure 1.4). Fiscal adjustments are necessary over the medium term to rebuild fiscal buffers. However, this leaves limited resources to achieve climate goals in many instances.

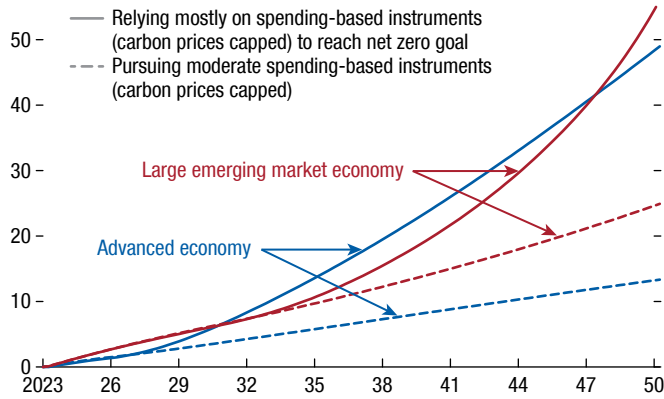
Relying largely on expenditure-based measures to achieve net zero emissions by midcentury would raise public debt-to-GDP ratios sharply and put debt sustainability at risk, as shown in an illustrative simulation (Online Annex 1.2).³ For a representative advanced economy, the simulation considers a policy package that combines a carbon price of \$75 a ton by 2030, maintained at that level until 2050, with spending-based mitigation policies that scale up public

investment and subsidies. Private sector investment responds to government policies, and accounts for the lion's share of the total green investment needed for decarbonization in the model. The simulation considers two scenarios with regard to spending policies: a substantial scaling up of green investment and subsidies to reach the net zero goal (solid blue line in Figure 1.5), and a moderate increase in such spending to contain the rise in debt (dashed blue line in Figure 1.5). The former scenario entails a much larger fiscal cost, a significant rise in the debt-to-GDP ratio (by 45 percentage points by 2050), and an associated pickup in government borrowing costs. Rising debt levels of the magnitude projected in the scenario are likely unsustainable. A gradual erosion of existing fuel tax bases as the economy decarbonizes could exacerbate these risks.⁴ In the scenario with a more moderate increase in expenditures, however, emissions would only fall by about 40 percent by 2050 from the current levels, insufficient to meet targets. Relying solely on carbon pricing to reach net zero would require a higher carbon price—at \$280 per ton by 2050 according to simulations in Online Annex 1.2—that might be politically unpalatable in many countries, despite carbon pricing's effectiveness in reducing emissions and generating revenues. It could adversely affect output and lead to uneven transition costs among households, making carbon taxes—similar to other revenue measures—less popular to enact or expand (Känzig 2023; Metcalf 2023).

⁴If countries find alternative ways to finance the spending-based measures (other than through carbon taxes or deficit financing), the rise in debt levels will be smaller.

³The simulation employs a New Keynesian dynamic general equilibrium model with an energy input and a rich set of fiscal policies based on Traum and Yang (2015). In the model, energy is used in the production of final goods and generated from both green and brown sources. Each energy source employs private capital and labor, as well as public capital in the case of green energy (for example, electricity grids) and private investment subject to adjustment costs. Heterogeneity among households allows the distributional effects of climate policies to be analyzed. Fiscal policies include carbon pricing, green subsidies, public investment, and targeted transfers, as well as standard taxes on consumption, labor, and capital income. See details in Online Annex 1.2. Similar studies have been conducted for *France* (Pisani-Ferry and Mahfouz 2023) and the *United Kingdom* (Office of Budget Responsibility 2021), using country-specific assumptions. The October 2020 *World Economic Outlook* considers the impact of a near-term investment push on climate transition and the macroeconomy.

Figure 1.5. Illustrative Debt Dynamics When Expenditure-Based Climate Policies Are Expanded
(Percent of GDP)

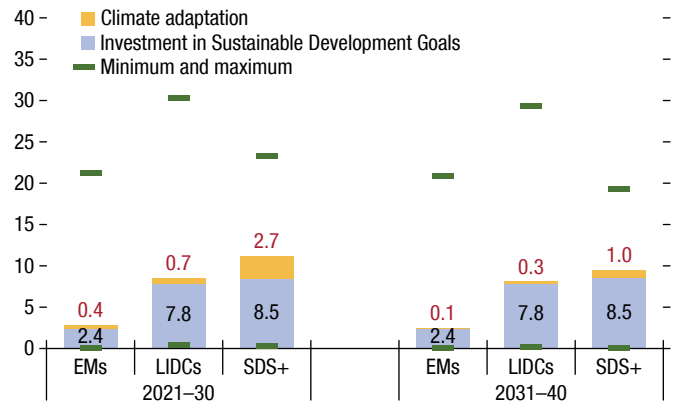


Source: IMF staff simulations.
 Note: The figure shows cumulative change in debt-to-GDP relative to a “business-as-usual” scenario based on simulations from a dynamic general equilibrium model (see Online Annex 1.2 for details). The lines for the advanced economy (large emerging market economy) cap the carbon price at \$75 (\$45) a ton. The solid lines scale up green public investment and subsidies (at 2 percent of GDP a year on average) to meet the net-zero-emissions target by 2050 (2060 for the emerging market economy), while the dashed lines have the same profile on carbon prices and a moderate rise in investment and subsidies, in line with International Energy Agency estimates.

The key priority for emerging market and developing economies is growth and development. This already entails significant challenges with respect to public finances regarding raising tax capacity and enhancing the spending efficiency (Benitez and others 2023; Budina and others 2023). The green transition would entail additional fiscal costs, especially if they rely on expenditure-based measures. A comparable simulation for a representative large emerging market economy considers a cap on carbon prices at \$45 a ton during 2030–50, together with a substantial increase in green investment and subsidies to reach net zero goals by 2060. Results of the simulation show that such a package would lead to an unsustainable surge in the debt-to-GDP ratio of more than 50 percentage points by 2050 (solid red line in Figure 1.5), with an associated sharp rise in borrowing costs. In the scenario with a more moderate increase in spending, emissions will only fall by 10 percent from current levels and will not be sufficient to achieve the net zero target (dashed red line in Figure 1.5).

Beyond investment in mitigation, many emerging market and developing economies need to build resilience and adapt to climate change. This is particularly the case for small developing states, which

Figure 1.6. Annual Investment Needs for Climate Adaptation and Sustainable Development Goals, 2021–40
(Percent of GDP)

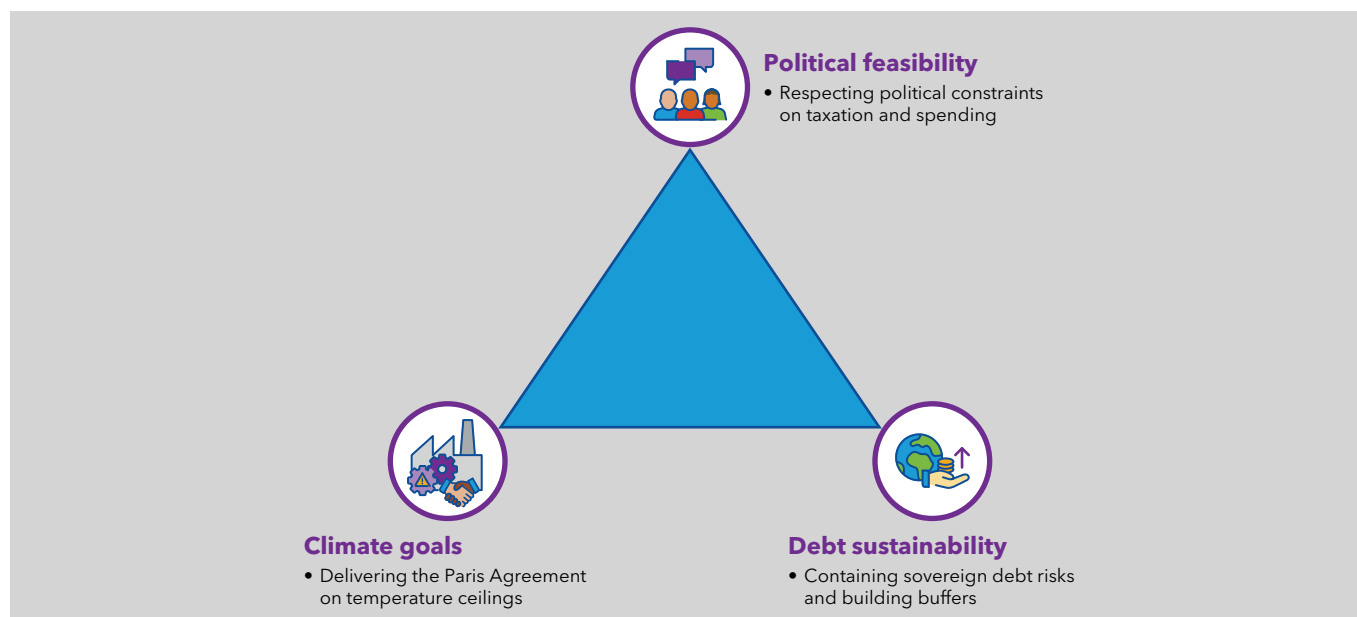


Sources: Aligishiev, Bellon, and Massetti 2022; and IMF staff estimates based on IMF’s SDG Financing Tool.
 Note: The figure shows the investment needs across country groups related to additional climate adaptation needs and, for countries that have not done so, achieving the Sustainable Development Goals (SDGs). Lines indicate the minimum and maximum total investment needs. SDGs are assumed to be met by 2040 by spending a constant fraction of GDP each year. Additional climate adaptation needs refer to needs to build resilience. “SDS+” consists of developing small states as well as countries that have adaptation needs larger than 2.5 percent of GDP for 2021–30. EMs = emerging markets; LIDCs = low-income developing countries.

have the largest needs for climate adaptation, at an average 2.7 percent of GDP a year until 2030, in addition to their already-sizeable needs for investment to meet other Sustainable Development Goals (Figure 1.6). Many low-income countries have no fiscal space, despite large needs in adaptation and relatively low-cost opportunities for abatement.

Fossil fuel-producing countries face a distinct fiscal challenge, as commodity revenues will decline markedly if the global economy pursues a path toward net zero emissions. Mesa Puyo and others (2023) estimate that for a group of 27 fossil fuel producers, fiscal revenue will decline by 5.5 percent of GDP on average between 2019 and 2040. These countries also need to reduce domestic emissions including from extractive industries, possibly adding to fiscal costs. However, the scope for using extractive revenues to finance economic development is highly sensitive to the pace of global decarbonization efforts (Box 1.2).⁵

⁵The impact on fossil fuel revenues depends on the scenarios of global transition, which affect the demand and production of fossil fuels. A given path for global fossil fuel production could be consistent with different price paths, implying a wide range of possible revenue and economic outcomes for fossil fuel-producing countries.

Figure 1.7. Climate Crossroads—Tackling the Climate Change Trilemma

Source: IMF staff compilations.

These issues point to a fundamental trilemma for policymakers between achieving (1) climate goals, (2) fiscal sustainability, and (3) political feasibility (Figure 1.7). If governments rely mostly on expenditure measures, this approach can be politically feasible, but debt will rise substantially. But if they instead continue on the current emission paths with only moderate measures, they cannot achieve their climate goals. Carbon pricing can relax fiscal pressures but—similar to other revenue measures—can be politically unpopular despite its efficacy in reducing emissions and revenue-generating potential (Klennert and others 2018; Douenne and Fabre 2022). The only way to jointly achieve these three goals is through a carefully calibrated mix of policies that varies across countries and involves carbon pricing alongside other measures to address distributional concerns and cost-of-living impacts, elaborated in the following sections.

Designing Efficient and Fiscally Responsible Policies

Governments need to design mitigation policy packages that effectively combine different instruments. This entails encouraging private sector behavioral shifts primarily through pricing mechanisms while accounting for (1) climate goals: choosing low-cost,

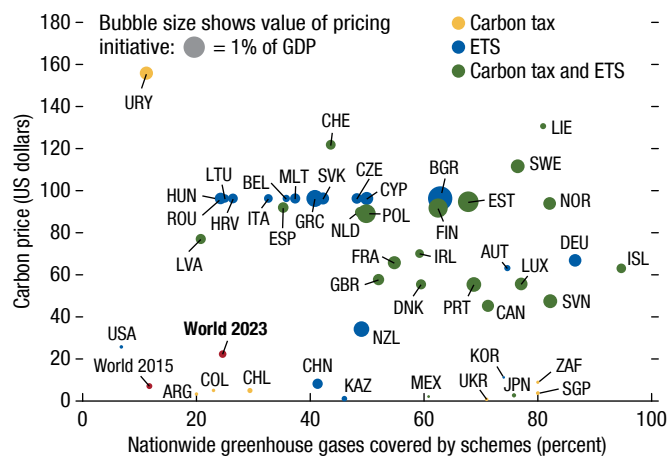
efficient instruments for abatement to achieve emission reductions; (2) fiscal sustainability: exploiting scope for revenue mobilization; and (3) political feasibility. At the same time, the policy mix should include complementary measures to address market failures, for example, to facilitate investment, innovation, and technology deployment, as well as to address social, distributional, and political acceptability concerns. These instruments are elaborated in the following.

Economywide Mitigation Policies

Carbon pricing is necessary but not sufficient to reduce emissions (Nordhaus 2021). It is the principal economywide mitigation instrument and can take the form of a carbon tax or an emission trading system.⁶

⁶See the October 2019 *Fiscal Monitor* and Parry, Black, and Zhunussova (2022) for details on carbon taxes and emission trading systems. An example is the EU Emissions Trading System, which limits, via permits, emissions of specified pollutants from sectors such as power generation, energy-intensive manufacturing, and air transportation and allows firms to trade their emission permits (a “cap-and-trade scheme”). The cap for total EU-wide emissions tightens every year. Some firms are still receiving free allowances for certain emissions, but those allowances will be phased out by 2030. Emission trading systems typically require more involved administration and may not be practical in countries with small numbers of firms that do not have liquid trading in the market (Dechezleprêtre, Nachtigall, and Venmans 2018).

Figure 1.8. Explicit National, Subnational, and Regional Carbon-Pricing Schemes, 2022
(Carbon prices, US dollars)



Sources: National sources; World Bank, Carbon Pricing Dashboard; and IMF staff calculations.

Note: EU ETS includes *Iceland, Liechtenstein, and Norway*. Prices are weighted averages across schemes in a country. Country-specific values are calculated using sold auctions and average prices. *Mexico's* subnational schemes and ETSs for *Indonesia* and *Montenegro* and are not included in the figure owing to lack of data. Data labels in the figure use International Organization for Standardization (ISO) country codes. ETS = emission trading system.

Economists find it to be the most efficient mitigation instrument, as it promotes the full range of behavioral responses to reduce energy use and shift to low-carbon fuels. It can also incentivize the private sector to innovate in and adopt new, low-carbon technologies, especially if a clear and credible rising price path is specified. Over the short to medium term, carbon pricing can raise substantial revenue, which can be used to finance other mitigation instruments and achieve broader economic and distributional objectives and thereby gain public support (Dabla-Norris and others 2023a; Dabla-Norris and others, forthcoming; Box 1.1). Carbon taxes are relatively easy to administer and can be integrated into existing procedures for collection of fuel taxes and extended to fossil fuels.

An increasing number of countries have adopted carbon pricing, suggesting that limited public support for carbon pricing is not a given. Carbon-pricing initiatives currently span 49 advanced and emerging market economies at various government levels, more than double the total one decade ago (Figure 1.8); at least 23 additional countries are planning to introduce carbon-pricing schemes, including *Kenya* as part of its efforts to achieve national emissions reduction targets (IMF 2023a). For example, *Sweden* successfully

introduced a carbon tax in 1991 as part of a broader set of fiscal reforms that included cuts in corporate and personal taxes, alongside extensive social discussion to reinforce political trust and transparency. *Chile* introduced green taxes in 2014 as part of a broader tax reform package that also included increasing education and health care spending. The process included public consultations and commitment to present results periodically. *Singapore* introduced a carbon tax in 2019 and reduced policy uncertainty by announcing the scheduled tax path through 2030, with carbon revenues used to support decarbonization efforts and help businesses and households cope with the green transition.

That said, overcoming political hurdles is challenging, making it difficult to raise carbon prices significantly or expand coverage to broader economic activity. Even if governments can overcome the negative perceptions, carbon-pricing schemes alone will be insufficient to enable countries to achieve their climate goals. For instance, carbon pricing alone will not suffice in reducing emissions in hard-to-abate sectors such as buildings, which require stronger incentives to retrofit old structures (for example, with electric heat pumps) to cut consumption of fossil fuel-based energy.⁷ Hence, carbon pricing is a necessary part of the policy mix but requires additional sectoral and other complementary policies.

In many countries, fuel excises provide an important source of fiscal revenues, generating between ½ and 1½ percent of GDP a year (de Mooij and others 2023). Over the medium to long term, however, those excises will decline as the carbon footprint of economies shrinks, requiring governments to collect alternative revenues to offset the loss, such as charges on vehicles per kilometer traveled (Online Annex 1.3). Elsewhere, countries still subsidize fossil fuels, sometimes at a high cost to government. Phasing them out provides opportunities to mitigate climate externalities and reduce fiscal costs.⁸

⁷Providing incentives for insulation and other retrofitting and for adopting energy-efficient appliances may require public support and could entail sizeable fiscal costs (UK Office of Budget Responsibility 2021; UNCTAD 2022a; Pisani-Ferry and Mahfouz 2023).

⁸According to Black and others (2023a), explicit fossil fuel price subsidies were \$1.3 trillion (1.3 percent of global GDP) in 2022. However, the absence of a price for the environmental damages from global warming, local air pollution, and traffic congestion adds another implicit subsidy on fossil fuels. Including all those social costs yields a staggering \$7 trillion (7.1 percent of global GDP) of total subsidies on fossil fuels.

Table 1.1. Comparison of Mitigation Instruments

Mitigation Instruments		Desirability and Feasibility				Environmental Effectiveness by Sector						
Coverage	Instrument	Economic Efficiency	Revenue Mobilization	Administrative Practicality	Political Acceptability	Power	Industry	Transport	Buildings	Forestry/Land Use	Extractives (CH ₄)	Livestock (CH ₄ , NO _x)
Economywide policies	Carbon taxes	✓✓✓	✓✓	✓✓	✓	✓✓✓	✓✓✓	✓✓	✓✓	✓	✓✓✓	✓✓✓
	Emission trading systems	✓✓✓	✓	✓	✓	✓✓✓	✓✓✓	✓✓	✓✓	✓	✓✓	✓✓
Sectoral policies	Feebates (fees/rebates for dirty/clean firms/products/activities)	✓✓	✓	✓	✓	✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓	✓✓
	Tradable performance standards	✓✓	✓	✓	✓	✓✓	✓✓	✓✓			✓	✓
	Green subsidies	✓✓	✓	✓	✓	✓✓	✓✓	✓✓	✓	✓	✓	✓
	Requirements for green technologies/activities	✓	✓	✓	✓	✓	✓	✓✓	✓✓	✓	✓	✓
Complementary policies	Issue	Network externalities for clean technologies			Innovation market failures	Burdens on households		Burdens on firms				
	Instruments	Public investments			R&D incentives, timebound technology subsidies	Targeted assistance, equitable revenue use		Output-based rebates, tax relief, border adjustments				

Declining efficiency/revenues/practicality/acceptability

✓ = Somewhat environmentally effective
 ✓✓ = Effective
 ✓✓✓ = Very effective

Source: IMF staff compilation.

Note: Environmental effectiveness reflects the extent to which policies exploit various potential behavioral responses for reducing emissions within a sector (based on economic theory and model simulations). CH₄ = methane; NO_x = nitrogen oxides; R&D = research and development.

Sectoral Mitigation Policies

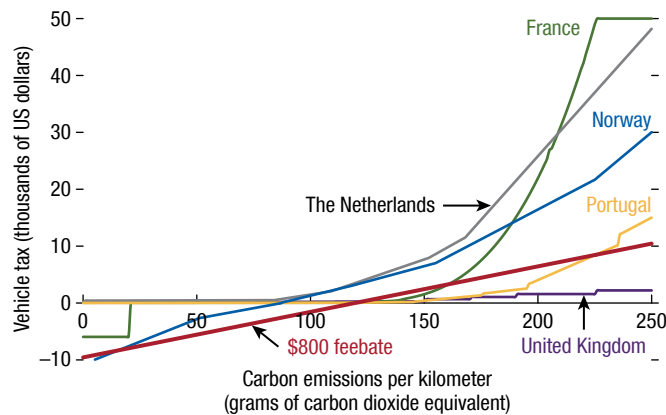
Sectoral mitigation instruments complement carbon pricing in important ways. Depending on their design, they are generally politically acceptable, can promote a broad range of behavioral responses from households and firms for cutting emissions, and address certain market failures or externalities. Common sectoral mitigation instruments include the following (also see Table 1.1).

- *Feebates* involve a sliding scale of fees associated with (and rebates on) products or activities with emission rates above (below) a specified pivot point whereby energy efficient practices are rewarded. They encourage a decline in emission intensity in a particular sector, although they do not promote full behavioral responses. For example, feebates encourage people to buy electric or fuel-efficient vehicles, but they do not encourage people to drive less. They are revenue neutral if the pivot point is aligned with average emission rates and updated over time. European countries have increasingly integrated them into vehicle taxation—often with very high implicit carbon prices—promoting a

rapid shift to electric vehicles in countries like *The Netherlands* and *Norway* (Figure 1.9). Feebates can also be applied to other sectors, although new administrative and technical capacity to monitor emissions is needed (Online Annex 1.4). Feebates usually have greater public support than carbon pricing, as they do not impose additional costs on the average household or firm.

- *Tradable performance standards* also provide broad incentives to reduce emission intensity. For example, firms are often required to meet a standard for average carbon emissions per kilowatt-hour across power generation plants or per ton of steel. Those that fall short of the standard can purchase credits from other firms that exceed the standard. Although such standards are usually politically acceptable, they do not raise significant fiscal revenue and require fluid markets for trading credits; thus, they are less practical for some sectors, such as forestry and residential buildings. *Canada* has a federal backstop program that includes an output-based pricing system for its industrial sector that concentrates taxation on large emitters to minimize

Figure 1.9. Effects of Feebates for New Vehicles, 2021



Sources: European Automobile Manufacturers' Association; and IMF staff estimates.

competitiveness and carbon leakage risks.⁹ China's tradable performance standard for the power sector, or intensity-based emission trading system, includes a benchmark on the maximum emissions per electricity generated.

- *Green subsidies* aim to overcome market failures and externalities related to the development, deployment, and adoption of low-carbon technologies.¹⁰ Although subsidies are generally considered undesirable from an economic standpoint because of potential distortions, the urgent need for rapid global decarbonization, including through technological innovations, can justify their use to address market failures and other externalities common in climate change. For example, subsidies for research and development can overcome underinvestment by private firms in critical technologies. Deployment subsidies can help firms exploit economies of scale to speed up the use of established low-carbon technologies. For instance, as part of reforms enacted in 2014–16, *Egypt* provided incentives to invest in and operate renewable power projects and sell electricity via long-term power purchase agreements to stabilize electricity prices (known as a “feed-in subsidy”). Under its Contracts for Difference scheme, the

⁹The federal backstop does not apply in all provinces as some have opted for their own carbon pricing policy design.

¹⁰Subsidies are sometimes part of government efforts to promote low-carbon technologies through measures targeted toward specific domestic firms, industries, sectors, or regions to promote domestic innovation, adoption, and production, generally referred to as “green industrial policies.”

United Kingdom offers subsidies for large-scale renewable energy projects, which gives private electricity generators greater certainty and reduces exposures to volatile wholesale prices. However, subsidies promote only limited mitigation responses. For example, subsidies for wind and solar generation only favor their use; they do not encourage a broad shift toward sources of less-polluting energy, such as from coal to gas or to other renewables. While subsidies often have strong domestic political appeal, they entail large fiscal costs and can generate negative spillovers, raising cross-border competitiveness concerns if not carefully designed or coordinated (Kammer 2023).¹¹

- *Regulation or minimum standards.* Another type of sectoral policy involves regulations or requirements such as minimum shares of renewable use for power generators or minimum shares of electric vehicles in vehicle sales fleets. For instance, since 2023, *Colombia* has required power utilities to procure at least 10 percent of the electricity sold to end users from renewable energy sources. Regulations promote only narrow behavioral shifts, however. For example, requirements regarding shares of electric vehicles in vehicle sales do not promote shifts to more efficient internal combustion engine vehicles. Regulations are also unlikely to generate fiscal revenue and can be costly for firms to comply with, particularly small and medium-sized enterprises. Regulations can be made more flexible and cost-effective by allowing firms to pay a fee or purchase credits that exceed their requirements. While the public usually supports these measures, they can often be difficult to administer, as multiple entities are involved.

Complementary Policies

Complementary policies to address market failures, support private sector efforts, and ease burdens on households and firms can play a role in improving the public perception and political feasibility of mitigation policies. These policies are not substitutes for economywide and sectoral mitigation policies but can improve their effectiveness.

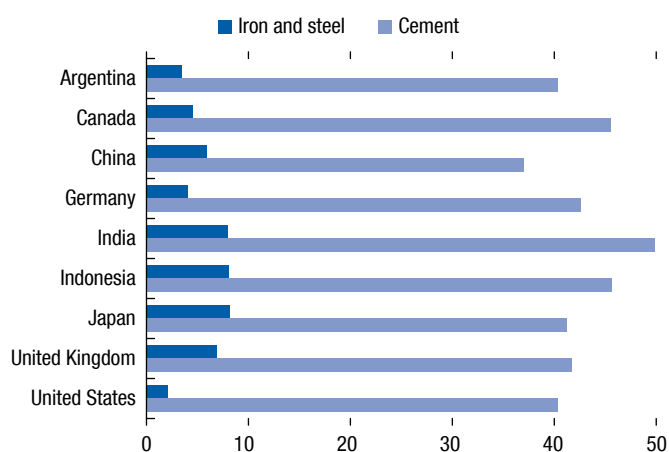
¹¹Subsidies tend to be generally politically acceptable because, while their benefits are typically well understood, their costs in terms of higher taxes or lower spending elsewhere tend to be less salient to the public (Dabla-Norris and others 2023b).

Public investment. With the right mix of policies, the private sector will fund most clean investments for decarbonization. However, some large-scale investments—such as pipelines for clean hydrogen and carbon capture and storage, high-voltage transmission lines to link different plants using renewables to generate electricity, or charging stations for electric vehicles—could be undersupplied if left entirely to the market. At the global level, the required additional public investment (new green investment on clean technologies of 0.4 percent of GDP net of the decline in fossil fuel investment of 0.1 percent of GDP) is estimated at about 0.3 percent of GDP a year, on average, with the upfront capital costs concentrated over the next 20 years and declining thereafter (IEA 2021; IMF 2021). Governments can undertake green public investment to complement private capital. For example, the *United States* National Electric Vehicle Infrastructure Program provides \$5 billion over five years to expand infrastructure for charging electric vehicles and establishing an interconnected national network. *India* has launched several initiatives regarding such infrastructure, notably the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles scheme.

Transfers. Climate measures such as phasing out fossil fuel subsidies and higher carbon prices will raise energy prices and, indirectly, the prices of other goods that use energy as an input. Governments can compensate households for the resulting impact by using a portion of the revenue from carbon-pricing schemes for targeted transfers to households, social safety nets, or lowering other taxes. Unemployment insurance coupled with active labor market policies could support workers in regions severely affected (Coady, Parry, and Shang 2018; October 2019 *Fiscal Monitor*). *Oman*, for example, started to phase out electricity subsidies in 2021 while protecting low-income households. *Indonesia's* fuel reform in 2016 included targeted support for poor households, which was linked to its social assistance program.

Competitiveness. Unilateral pursuit of climate policies can raise cross-border competitiveness concerns. For example, production costs for energy-intensive, trade-exposed industries covered by carbon-pricing schemes would increase because of the associated costs to adopt emission reduction measures as well as from higher electricity costs. To avoid these costs, industries could relocate to other countries with less stringent emission standards or carbon pricing.

Figure 1.10. Change in Domestic Iron and Steel and Cement Production Costs from Baseline, 2030 (Percent)



Source: IMF staff estimates using the IMF–World Bank Climate Policy Assessment Tool.

Note: The pricing policy depicted in the figure imposes charges of \$50 a ton of carbon dioxide. Production cost increases include mitigation costs and charges on unabated emissions.

Using the IMF–World Bank Climate Policy Assessment Tool, Figure 1.10 illustrates direct production cost increases, relative to baseline production costs, for iron and steel and cement under a unilaterally imposed carbon tax of \$50 a ton in 2030. Production costs increase by about 5–10 percent for iron and steel but by a more substantial 35–50 percent for cement. Changes in sectoral emissions arising from moving production to countries with laxer emission standards (carbon leakage) are estimated at 10–30 percent, under plausible assumptions regarding production cost increases, pass-through into domestic consumer prices, and the cost of relocation (Parry and others 2023). These effects are small, however, relative to the economywide reductions in emissions that the tax achieves. Border carbon adjustments, in which a fee is charged on carbon embodied in imported products, possibly matched by rebates for exports to restore a level playing field for domestic and foreign firms, can mitigate these competitiveness concerns.¹²

¹²The *European Union* is phasing in a border carbon adjustment mechanism involving charges on imported aluminum, cement, steel, fertilizers, and electricity. It is also phasing out free allowance allocations under its Emission Trading System for domestic producers in the industries that produce these products. See Parry and others (2021) and Keen, Parry, and Roaf (2021) for a discussion of the economic and legal aspects of border carbon adjustments.

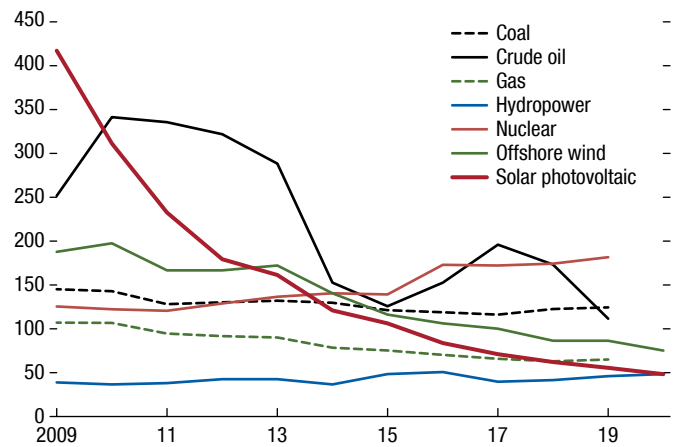
However, such adjustments need to account for carbon pricing in trading partners, limit administrative burdens, and avoid violating World Trade Organization rules.

Promoting Technology Diffusion and Innovation

Technological innovation and deployment of low-carbon technologies will play a key role in achieving global climate mitigation goals. Overcoming obstacles to diffusion is crucial, as many technologies for emission reductions already exist. According to the International Energy Agency (2020, 2022a), use of known and commercially proven technologies can achieve about 90 percent of the emission reductions necessary to achieve climate goals by 2030. The cost of many of these technologies has already decreased significantly during recent years (Figure 1.11). Solar power has become the most affordable renewable source of electricity—even cheaper than fossil fuels—thanks to modular production, installation efficiency, economies of scale, learning-by-doing effects, and government support from various countries (IEA 2020b; see Online Annex 1.5). However, financing and capacity limitations hinder the adoption of clean frontier technologies in emerging market and developing economies (UNCTAD 2022b; Capelle, Pierri, and Bauer 2023). Moreover, government policies and network infrastructure can play a vital role in the adoption and deployment of low-carbon technologies. For instance, renewables require electricity markets with low regulatory barriers to encourage private sector participation, while the electrification of energy end use in transportation, industry, and buildings requires upgraded grid technologies.

In the medium to long term, new technologies will be necessary, including those that are currently in the early stages and not yet commercially available. For instance, carbon capture and storage is still in its infancy—even though efforts to accelerate adoption have been ongoing for decades. A key challenge for technology adoption is that firms pioneering the technology may not fully capture the spillover benefits that other firms imitating the technology could gain by leveraging the knowledge or benefiting from the learning-by-doing experiences. Fiscal interventions are thus likely needed, including through public research and development, as well as incentives for private research and development through patents, research subsidies, tax incentives, prizes, or some combination

Figure 1.11. Learning Curves for Power Generation, by Technologies
(US dollars per megawatt-hour)



Sources: IRENA 2022; Way and others 2022; and Ziegler and Trancik 2021a, 2021b.

Note: The figure shows the levelized cost of electricity: The average net present cost of electricity generation over the lifetime of the generator.

of these.¹³ However, these incentives need to be carefully designed.

An increasing number of countries are adopting policies to promote domestic innovation, adoption, and production of low-carbon technologies, such as subsidies and tax incentives for specific domestic firms, industries, sectors, or regions. Such policies will need to be time bound, transparently presented in budgets under a strong governance framework, and complemented with carbon pricing. They should not violate the legal obligations imposed by trade agreements; international coordination is required to minimize adverse spillovers. When implemented in accordance with these principles, such policies could accelerate decarbonization. However, uncoordinated actions pose significant risks by distorting trade and investment flows and could give rise to competitiveness concerns and a “subsidy race” that harms developing countries (Cherif and others 2022; IMF, forthcoming). Other instruments such as government credit guarantees and public-private partnerships, often

¹³In principle, with a robust and efficient price for carbon emissions, additional incentives for development of clean technology should be similar to those for general research and development. Additional treatment can be warranted if the appropriability problem is more severe for clean technologies than for other technologies. This may be plausible in regard to technologies that are currently far from the market (for example, green hydrogen-based energy).

carry fiscal risks and need to be monitored closely under strong institutional frameworks (Battersby and others 2022).

Technology transfer and stronger institutions are conducive to technology absorption. They require robust legal and regulatory frameworks, transparent governance, property rights enforcement, and fair competition (Kießling 2007; Manca 2009; Budina and others 2023). Moreover, enhancing development of human capital and investment in information and communications technology and other infrastructure can effectively harness the benefits.

Debt Impact of Climate Policy Packages

This section considers a policy package that achieves net zero emissions by midcentury. The package combines revenue and expenditure measures, including carbon pricing (to reduce emissions efficiently and generate fiscal revenues), green public investment (to complement green private capital), green subsidies (to encourage innovation and deployment of clean energy), and targeted transfers (to mitigate adverse impacts on households during the green transition). In this scenario, the private sector is expected to fund the majority of investment for decarbonization. The analysis operationalizes the net-zero-emissions target as an 80 percent reduction in 2023 emission levels by 2050 for advanced economies and by 2060 for emerging market economies, with the assumption that carbon capture and storage will offset the remaining emissions (IMF 2021; Black and others 2022a).

Using the same dynamic general equilibrium model as in “Are Current Policies Scalable on the Road to Net Zero?” this section simulates the effects of this policy package on debt dynamics for a representative advanced economy and emerging market economy. The effects of the policy package also depend on how fiscal instruments affect growth and interest rates. For instance, carbon pricing will increase government revenues but reduce near-term output. Expenditure measures will support output in the short term, while higher public capital will add to the economies’ productive capacity, boosting long-term output. However, higher expenditures raise budget deficits and add to the pressures on interest rates and government borrowing costs by raising the demand for capital (macroeconomic channel) and increasing the supply of government debt (fiscal channel). The balance between

carbon-pricing and expenditure measures in the overall package, as well as the endogenous effects on output and interest rates, determine the debt dynamics between today and 2050.

Advanced Economies

For a representative advanced economy calibrated to the average of data for Group of Seven economies, the simulated policy package requires an ambitious increase in carbon pricing, with the price reaching \$130 a ton by 2030 and \$235 a ton by 2050.¹⁴ Despite rising carbon prices, revenues from carbon sources are projected to peak in about 2030, as decarbonization gradually erodes the carbon tax base. Hence, despite increasing carbon prices, carbon revenues as a share of GDP decline during 2030–50. On the expenditure side, the simulations assume a combination of an increase in green public investment and front-loaded green subsidies equivalent to about ½ percent of GDP, and transfers equivalent to 30 percent of carbon revenue (Känzig 2023).

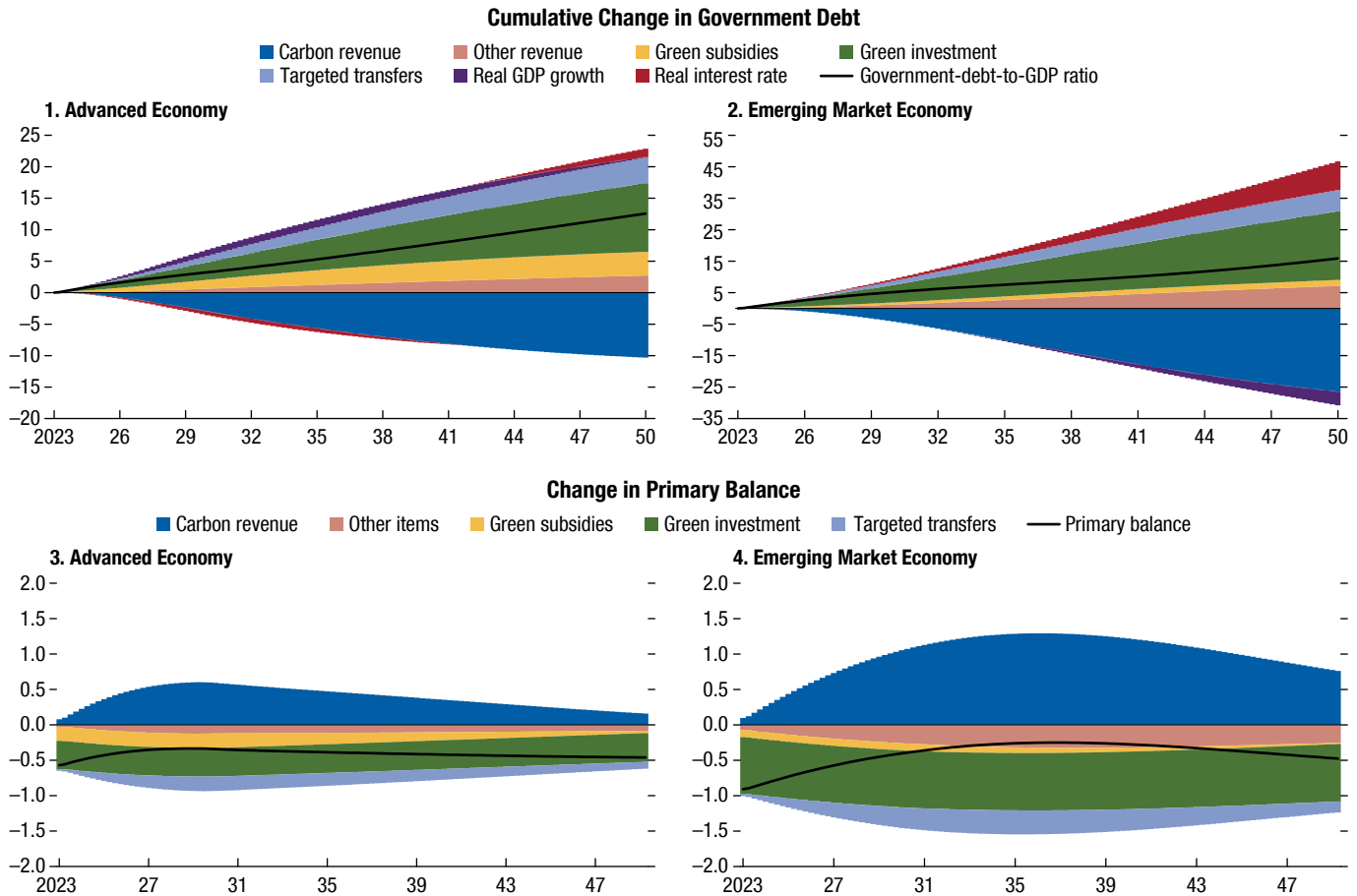
On balance, the debt-to-GDP ratio in this representative advanced economy increases by 10–15 percentage points by 2050, with the primary deficit rising moderately, by 0.4 percent of GDP a year, relative to the “business-as-usual” baseline in this scenario (Figure 1.12, panels 1 and 3) (Online Annex 1.2). Interest rate effects would be relatively muted because government debt would rise moderately, and lower demand for capital in brown sectors would partly offset the higher demand for capital in the green sector. Some advanced economies may have fiscal space to pursue such a combination of fiscal policies to meet the net-zero-emissions goal while maintaining debt sustainability. Countries can also raise revenues from other taxes or reduce other spending to contain the rise in debt.

Emerging Market and Developing Economies

A similar simulation is conducted for a representative large emerging market economy but with several differences compared to the representative advanced economy. First, most emerging markets currently have a lower share of

¹⁴The carbon prices are in line with the net-zero-emission scenario in IEA (2021). A price of \$235 a ton by 2050 is lower than the \$280 a ton by 2050 that would be necessary to achieve net zero emissions if carbon pricing were the only instrument used.

Figure 1.12. Implications of Net-Zero-Policy Packages on Debt and Primary Balance, Relative to “Business-as-Usual” Baseline, by Fiscal Component
(Percent of GDP)



Source: IMF staff simulations.

Note: For advanced economies, parameters and fiscal instruments are calibrated to a representative large advanced economy (that represents the average of data for Group of Seven economies). The policy package is designed to achieve net zero emissions in 2050. The value for public investment is consistent with the upper range of estimates by the International Energy Agency (2022b). Green subsidies are assumed to be front loaded and phased out after 2030, and targeted transfers are assumed to be proportional (at 30 percent) to carbon revenues. Given later emission peaks in emerging market economies, the policy package for those economies is designed to achieve net zero emissions by 2060. “Other revenue” includes taxes from capital, labor, and consumption, which vary owing to endogenous effects from macroeconomic variables even though tax rates are held the same. Parameters and fiscal instruments are calibrated to a representative emerging market economy that is assumed to reflect the weighted average of data for *Argentina, Brazil, China, India, Indonesia, Mexico, South Africa, and Türkiye*. The value for public investment is consistent with the upper range of International Energy Agency estimates for emerging market economies. For details, see Online Annex 1.2.

green energy than advanced economies and will have a lower carbon price during the initial phase of decarbonization—assumed in the simulation to reach \$45 a ton by 2030, gradually rising to \$150 a ton by 2050. Yet this lower carbon price yields greater carbon revenue than the case in an advanced economy for a longer period and leads to a later peak in emissions and carbon revenue (Figure 1.12, panels 2 and 4).¹⁵ Second, green investment needs in

¹⁵The simulations are based on *effective* carbon prices and so implicitly capture the effect of removing fossil fuel subsidies.

emerging market economies are larger (at $\frac{3}{4}$ percent of GDP per year), owing to different ownership structures and less private investment in mitigation, consistent with International Energy Agency (2022b) estimates. Third, emerging market economies also face a higher risk premium—that is, greater sensitivity of borrowing costs to rising debt levels. Transfers to vulnerable households are assumed to be 30 percent of carbon revenue, the same as the scenario for advanced economies.

Incorporating these distinctive features and specific assumptions, the model simulation of this

illustrative scenario suggests that public debt would increase by about 15 percent of GDP by 2050 in these economies relative to the “business-as-usual” baseline, equivalent to a rise in primary deficits by 0.4 percentage point of GDP a year on average (Figure 1.12, panel 4). The simulated rise in debt is subject to a wide range of 8–25 percent of GDP by 2050, depending on public investment, subsidies, and targeted transfers, as well as whether countries are fossil fuel producers (see alternative scenarios in Online Annex 1.2).¹⁶ While the increase in debt-to-GDP ratio is comparable to advanced economies, the composition is different, with larger contributions from interest costs and higher public investment needs, while carbon revenues are higher.

Many emerging market economies would find the increases in debt and deficits challenging, especially those already experiencing high debt, as rising borrowing costs lead to higher interest payments and account for a sizable part of the deteriorating debt dynamics. As a result, they would be unable to afford a large redistribution of carbon revenues or meet their public investment needs. These call for improving spending efficiency and mobilizing alternative sources of finance, including other domestic tax revenues (Benitez and others 2023), and a greater role for private financing. A well-calibrated fiscal strategy could crowd-in private investment and financing to jumpstart growth, critical for emerging markets with limited fiscal space. Low-income developing countries should prioritize reducing energy intensity and adapting to climate change, given limited access to financing and modest contributions to global emissions. Reconciling climate challenges with growth and development needs in emerging market and developing economies therefore calls for efforts to mobilize domestic revenues and global financial support. For example, the IMF Resilience and Sustainability Trust provides long-term financing—

¹⁶Fiscal costs will vary depending on the mix of revenue and spending policies. Sensitivity analysis shows that if government transfers are 50 percent of the revenue from carbon taxes, debt would rise by 25 percentage points of GDP by 2050, with an increase in primary deficits of 0.6 percentage point of GDP a year on average. If instead public mitigation investment and subsidy is reduced by about ¼ percent of GDP per year, debt would increase by 8 percentage points of GDP. Alternatively, if climate policies primarily rely on carbon pricing (higher than the baseline) with modest public investment of ¼ percent of GDP per year with no subsidy spending, the resulting carbon revenues can more than offset the investment spending and related transfers to households, leading to a small primary surplus, especially during the peak of carbon revenue (see Online Annex 1.2).

which augments fiscal space and financial buffers—to strengthen economic resilience and support reforms that reduce risks associated with longer-term structural challenges, including climate change. The involvement of multilateral development banks plays a role to leverage private investment and provide risk-absorption capacity (October 2022 *Global Financial Stability Report*, Chapter 2). Moreover, knowledge transfers and deployment of established low-carbon technologies in these economies will be critical to raising productivity, crowding in private sector investment, and reducing overall fiscal costs (Online Annex 1.2).

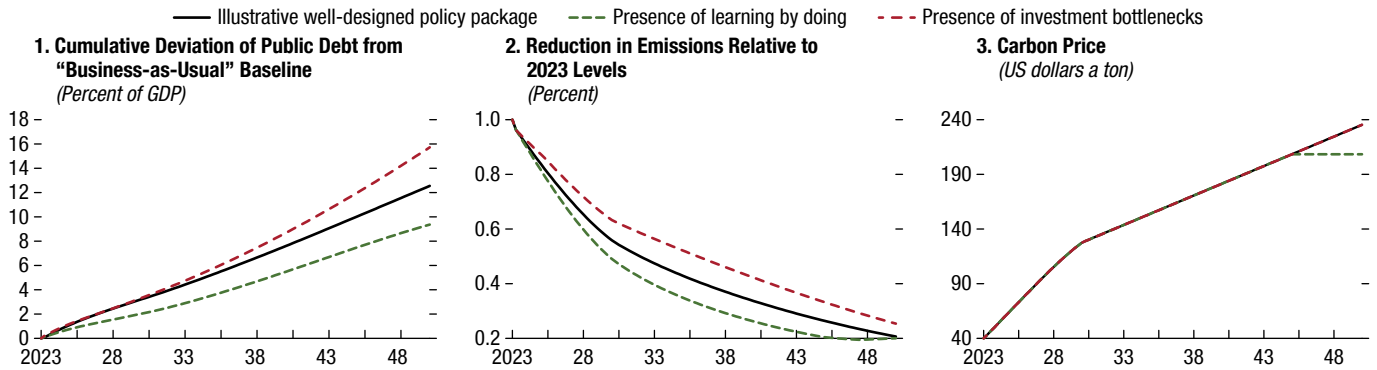
Technology Spillovers and Investment Bottlenecks

The effectiveness of green subsidies will depend on how firms respond to fiscal incentives and how easily they can shift to, or invest in, low-carbon technologies. Model simulations show that green subsidies will be more effective if learning-by-doing effects in clean technologies are present, allowing a faster reduction in emissions and limiting the associated output costs, while keeping public debt contained (dashed green line in Figure 1.13). However, bottlenecks to green investment, such as limited institutional capacities and disruptions in supply chains for critical minerals because of geoeconomic fragmentation (October 2023 *World Economic Outlook*, Chapter 3), could limit the potential for rapid uptake of green technology. Stranded assets in brown sectors—assets that need to be written down prior to the end of their economic life, such as old coal plants—could also be costly to divest or phase out. Such bottlenecks, if they take the form of adjustment costs imposed on investment, would slow the shift toward renewable energy, making green subsidies less effective and causing debt-to-GDP ratios to rise further (dashed red line in Figure 1.13). This also implies that emission targets may not be reached unless more forceful action through other measures, such as higher carbon prices, is taken.

The model is next used to explore different assumptions and policy packages. This exploration provides several key lessons in respect to policy design:

- *Delaying action on carbon pricing is costly.* Each year of delay in raising carbon prices is found to increase public debt by 0.8–2.0 percentage points of GDP in advanced economies, depending on how quickly carbon prices adjust after the initial delays and

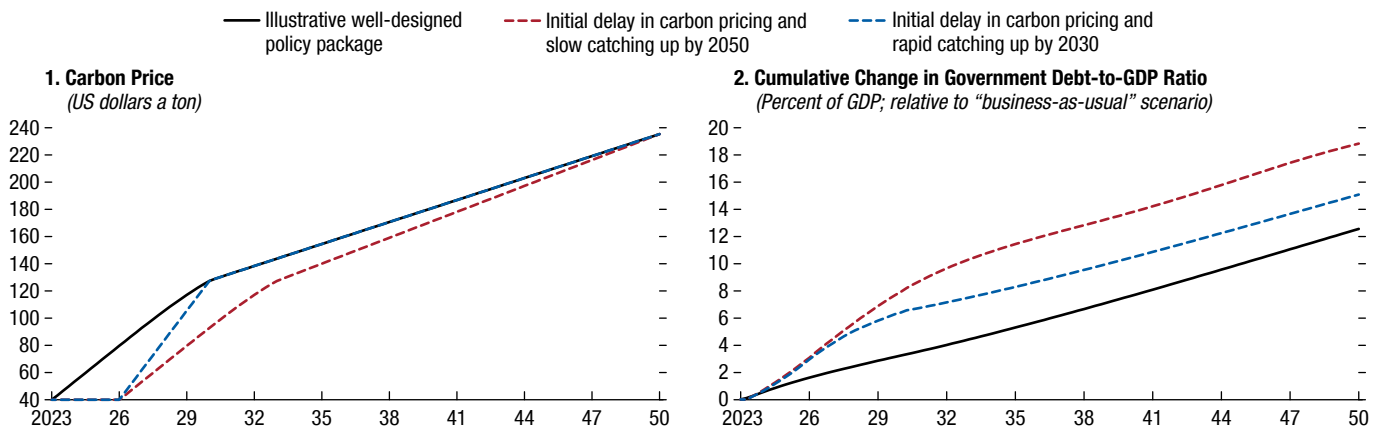
Figure 1.13. Impact of Technology Spillovers and Investment Bottlenecks on Debt Dynamics



Source: IMF staff simulations.

Note: The figure assumes carbon prices are the same across scenarios before reaching net-zero-emission goals and is calibrated to a representative advanced economy (that reflects the average of the data for Group of Seven economies). When learning by doing is present, a 1 percent increase in energy capital is assumed to raise total factor productivity by 0.1 percent in the energy sector, in accordance with Chang, Gomes, and Schorfheide (2002) and Dietz and Stern (2015).

Figure 1.14. Costs of Delay in Raising Carbon Prices



Source: IMF staff estimates.

Note: The scenario depicted in the figure assumes a three-year delay (from 2023 to 2026) in raising carbon prices relative to the illustrative well-designed policy package for the representative advanced economy in the chapter text.

assuming that spending-based policies are scaled up to deliver the same level of emission reductions by 2050 (Figure 1.14; Online Annex 1.2). Although carbon revenues are projected to peak later for emerging market economies, delays would still increase debt in a notable way (about 0.9 percentage point of GDP), even when carbon prices catch up quickly following the initial delay. The longer countries wait to make the shift to a greener future, the costs will likely be larger (October 2022 *World Economic Outlook*, Chapter 3).

- *Policy sequencing matters.* Although public debt would likely increase during the green transition, combining fiscal instruments strategically can limit the rise in debt. For instance, the initial rise in carbon tax

revenues could be timed to coincide with front-loaded expenditures on green subsidies, containing the impact on deficits. Delaying carbon revenues until after emissions have peaked will decrease the revenue base and widen fiscal deficits in the interim.

- *Accounting for technology spillovers and addressing investment bottlenecks is critical.* The presence of externalities or spillovers can increase the effectiveness of green subsidies, enabling lower decarbonization cost. At the same time, addressing bottlenecks, such as reducing trade frictions or diversifying supply chains, will allow firms to shift swiftly toward clean energy. At the international level, augmenting international climate finance

can facilitate trade in low-carbon technologies and their components and scaling up of technology transfer (IMF 2021).

- *Catalyzing private climate finance will help decarbonization.* Existing commercially proven technologies have potential to promote decarbonization. Policies that price carbon or otherwise incentivize these technologies help catalyze private climate finance and accelerate the shift toward clean energy and technologies. Catalyzing private climate finance can take many forms, including the use of subsidies, environmental regulations, and strengthening the climate information architecture (data, disclosure, and taxonomies), as well as public-private risk sharing through blended finance structures (October 2023 *Global Financial Stability Report*, Chapter 3). However, some instruments, such as government credit guarantees, can be associated with large fiscal risks.
- *Incorporating climate actions in debt sustainability analysis is essential.* Projected debt levels show considerable uncertainty, depending on the size of investment needs, assumptions about the elasticity of substitution between energy sources, the economic impact of fiscal policies, and the degree to which firms and households take up different tax credits and subsidies (Online Annex 1.2). In addition, the effects of global warming on economies are also subject to considerable uncertainty. Some mitigation policy packages for emerging market economies may turn out to be less affordable than others, which will require further mobilizing domestic tax revenues and incentivizing greater private financing. The uncertainty about the path that debt will take highlights the need to develop further tools to incorporate climate actions into debt sustainability analysis.¹⁷

¹⁷For example, the IMF Quantitative Climate Change Risk Assessment Fiscal Tool assesses the fiscal risks from long-term climate change by quantifying climate scenarios against a baseline (Harris and others 2022; Harris, Tim, and Rahman 2023). The IMF's Sustainable Development Goals—Climate tool integrates climate change and natural disaster risks into a dynamic growth model to assess the financing and debt trade-offs of policies in reaching Sustainable Development Goals (Bartolini and others 2023). Akanbi, Gbohoui, and Lam (2023) provide a tool in calibrating fiscal rules considering natural disaster risks. In addition, the IMF has made efforts to improve the availability of quality climate data to support decision making and foster public awareness, such as the IMF Climate Change Indicators Dashboard and related publication on *Data for a Greener World* (IMF 2023b) and IMF Data Standards Initiatives. The IMF continues to work toward enhancing the climate information architecture, collaborating with international standard setters and international financial institutions.

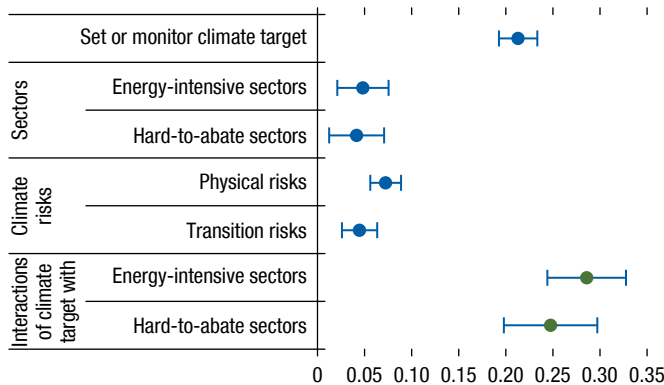
The effects of climate policies on debt dynamics also reflect the uneven impacts of such policies across age groups. Analysis based on an overlapping-generations model (Kotlikoff and others 2021) shows that mitigating the adverse impact of the green transition on current age cohorts through debt-financed transfers will impose higher taxes on future cohorts to finance future debt service (Online Annex 1.6). In contrast, if governments pursue a balanced-budget policy, each generation will bear the cost of contemporaneous climate change mitigation efforts. Current generations may be reluctant to advance climate mitigation, as they bear most of the costs, whereas future generations would suffer from worse climate outcomes arising from limited action today.

Rising public debt and scaled-up green public investment point to the need for strengthening fiscal frameworks and institutions to enhance spending efficiency and improving debt and investment management and practices (Online Annex 1.7). Green public financial management integrates climate considerations into existing budget processes. Existing frameworks can be adapted to prioritize and direct scarce resources to policies that respond to climate concerns. Public financial management should also promote transparency and accountability for the climate impact of fiscal policies. Moreover, governments need to ensure green public investment is routed through the usual budget channels. Alternative systems dedicated to green investments—such as extrabudgetary operations or provisions to exclude green investment in fiscal rules—run the risk of fragmenting the budget and fiscal decision making. While project-specific financing can attract private investors, earmarking public resources risks creating budget rigidities.

Facilitating Green Transition in Firms

The green transition will require strong complementary actions on the part of public and private actors because—as discussed earlier in the chapter—firms will need to undertake the majority of decarbonization efforts, working in tandem with governments to shift toward clean energy and technologies. Regulatory measures and fiscal incentives can encourage firms to improve energy efficiency, reduce their energy use, or invest in or adopt low-carbon technologies. This section examines the impact of these policies on firms' climate investments and resilience to higher energy prices, strengthening the case for using a mix of

Figure 1.15. Likelihood of Investing in Mitigation: New, Less-Polluting Technology
(Coefficient estimates)



Sources: European Investment Bank Group Survey on Investment and Investment Finance 2022; and IMF staff estimates.

Note: The figure shows estimated coefficients obtained from a linear regression model that includes country fixed effects and robust standard errors (see Online Annex 1.8). The dependent variable is binary, based on firms' responses to a survey question on whether they are investing in new, less-polluting business areas and technologies to reduce their greenhouse gas emissions. Results are consistent with the findings of the 2023 *EIB Investment Report*. The whiskers indicate the 95 percent confidence interval for the estimated coefficients.

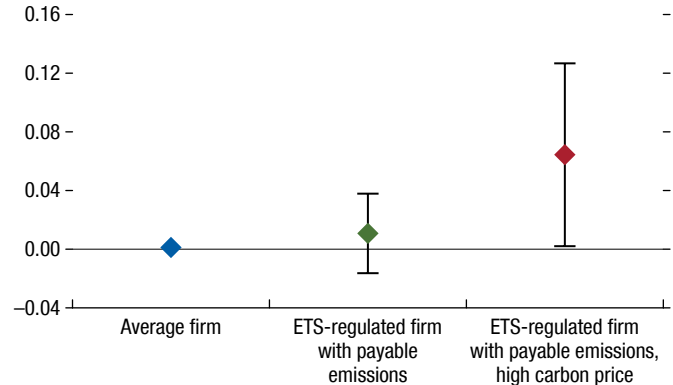
instruments, including carbon pricing, to facilitate decarbonization.

Regulations can enhance firm investment in low-carbon technologies. Analysis of a representative firm-level survey from the European Investment Bank¹⁸ provides evidence that firms that set or monitor emissions, particularly those operating in energy-intensive or hard-to-abate sectors (which are often subject to government regulations or emission standards) are among the most likely to invest in new, less-polluting technologies or products (Figure 1.15; Online Annex 1.8).¹⁹

¹⁸The European Investment Bank Group Survey on Investment and Investment Finance is a survey, administered by the European Investment Bank, covering all *European Union* 27 countries, the *United Kingdom* (until 2021), and the *United States* (since 2019), comprising approximately 13,000 firms annually. The survey is designed to be representative at the country level as well as sector and firm-size levels for most countries. For technical details, please see Brutscher and others (2020).

¹⁹While firm-level data cannot distinguish between mandatory and voluntary climate targets, the empirical result corroborates findings in existing literature that firm-level climate targets are positively correlated with investment in renewable energy and emission reduction (Ioannou, Li, and Serafeim 2016; Wang and Sueyoshi 2018; Dahlmann, Branicki, and Brammer 2019; Colmer and others 2022), with stronger effects for firms in energy-intensive sectors or in sectors with high abatement costs. Several advanced economies, among them *France*, *Japan*, *New Zealand*, and the *United States*, have regulations mandating firms' disclosures of climate risks (Carattini and others 2022).

Figure 1.16. Environmental Policy Stringency and Changes in European Firms' Investment
(Coefficient estimates)



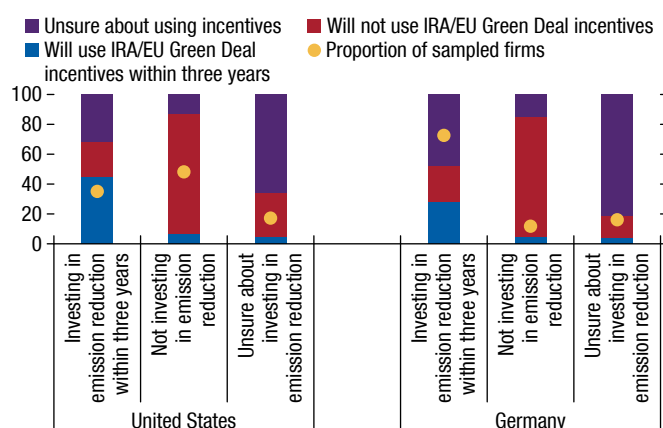
Sources: EU Emissions Trading System (ETS); European Investment Bank; IMF, World Economic Outlook database; Kalantzis and others, forthcoming; Orbis; and Organisation for Economic Co-operation and Development (OECD).

Note: The figure shows estimated coefficients obtained from a panel regression model for 12 European countries during 1995–2020 (see Online Annex 1.8). The dependent variable is changes in fixed assets (in logarithms) as a proxy for investment. Each coefficient estimate represents the impact of changes in the OECD's market-based Environmental Policy Stringency Index for the indicated sample of firms. "ETS-regulated firms" are those with regulated installations in the EU ETS. "Payable emissions" are the difference between verified emissions and free allowances. "High carbon price" refers to periods when EU carbon price exceeds 75th percentile. The whiskers indicate the 95 percent confidence interval for the estimated coefficients.

The stringency of regulatory policies associated with climate also affects the investment behavior of firms. To explore this, the analysis here examines firms regulated under the EU Emissions Trading System. It suggests that more stringent market-based policies that put a price on pollution, such as permit prices in carbon-trading schemes and taxes on greenhouse gas emissions, have a significant positive impact on the investment by firms regulated under the system, but only in periods of already-high carbon prices and when emissions exceed allowance levels (Figure 1.16). However, these regulations have no significant impact when emissions are within their free allowance levels. These findings suggest a reinforcing role between high carbon prices and market-based regulatory measures, in which stringent policies could provide incentives for investment by firms if they need to pay for emissions at high carbon prices (Online Annex 1.8).

An important question is whether firms are sufficiently resilient to respond to a rise in the cost of carbon-based energy. To assess firm responses to shocks to energy cost, this section explores how firms have responded to the energy price hike of 2022. Two surveys of firms in *Germany* and the *United States* (Online Annex 1.9) show that firm balance sheets have

Figure 1.17. Firms’ Plans for Utilizing Incentives of Recent Climate Policy Packages in United States and Germany, Spring 2023
(Percent of firms surveyed)



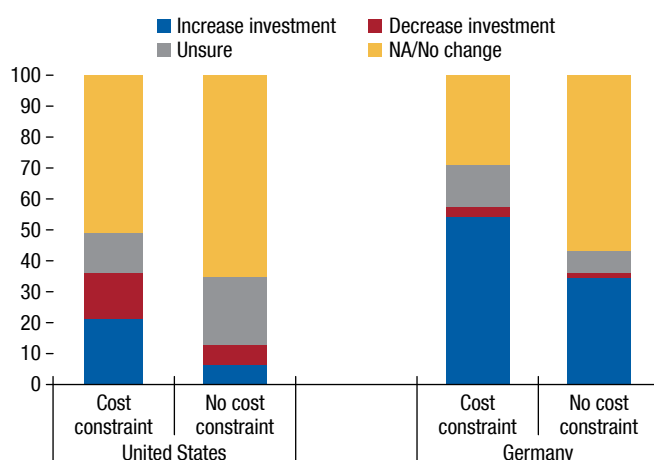
Sources: Business Inflation Expectations Survey (Federal Reserve Bank of Atlanta); Bundesbank Online Panel—Firms; CFO Survey (Duke University, Federal Reserve Bank of Richmond, and Federal Reserve Bank of Atlanta); and IMF staff estimates. Note: The stacked bars reflect the proportions of sampled firms that responded to surveys on their willingness to use incentives provided by the Inflation Reduction Act (firms in the *United States*) and Green Deal Industrial Plans (firms in *Germany*). The figure shows the share of firms that will use incentives in their country’s policy packages. IRA = Inflation Reduction Act.

been, on average, remarkably resilient to the 2022 energy price shock, with no large cuts in firms’ output, employment, or profitability (Box 1.3).²⁰ Firms have been able to pass the shocks to downstream firms or final consumers. Firms in *Germany*, which faced a larger spike in energy prices, responded to the price hike by both increasing or planning to increase investment in energy efficiency and reducing energy consumption.

Policymakers can also provide firms with fiscal incentives to enhance their green investment, although the effectiveness of these incentives depends on their design and implementation. Results from the same surveys show that some firms in *Germany* and the *United States* responded to the fiscal incentives announced in recent policy packages, such as the US Inflation Reduction Act of 2022 and the EU Green Deal Industrial Plan. Firms taking advantage of these fiscal incentives were often already investing in emission reductions, especially if they considered cost a major hurdle for investment (Figures 1.17 and 1.18).

²⁰The surveys were conducted in collaboration with the Federal Reserve Bank of Atlanta’s Business Inflation Expectations Survey; Duke University, Federal Reserve Bank of Richmond, and Federal Reserve Bank of Atlanta CFO Survey; and Bundesbank Online Panel in *Germany*.

Figure 1.18. Firms’ Responses to Financial Incentives to Invest in Emission Reduction, Spring 2023
(Percent of firms surveyed)



Sources: Business Inflation Expectations Survey (Federal Reserve Bank of Atlanta); Bundesbank Online Panel—Firms; CFO Survey (Duke University, Federal Reserve Bank of Richmond, and Federal Reserve Bank of Atlanta); and IMF staff estimates. Note: The stacked bars reflect the proportions of sampled firms that responded to surveys on whether they will adjust investment in emission reductions based on incentives of the Inflation Reduction Act (firms in the *United States*) and Green Deal industrial policies (firms in *Germany*). The vertical bars show the share of firms that report cost as one of the top three constraints on investment in emission reduction. NA = not applicable or no change.

However, the majority of firms in *Germany* reported that they were uncertain about the impact of policies on their climate-related investment plans.

This firm-level empirical analysis provides evidence that firms respond to regulations and fiscal incentives, which can accelerate the green transition, in particular when firms can calculate the impact of fiscal policies on their profitability from investing in the green transition. These findings offer several lessons for policy design and implementation:

- *Regulatory measures can facilitate the green transition, with varying effects.* Evidence suggests that firms adapt to stricter climate regulations by increasing investment. Policies that require firms to monitor their climate targets could reinforce higher carbon prices and are often associated with higher investment in low-carbon technologies by firms, particularly those in energy-intensive sectors.
- *Firms have been resilient on average and adapted to higher carbon prices.* Firms were broadly resilient to the 2022 energy price spikes and likely could adapt to higher energy prices by reducing energy consumption, investing in energy efficiency, and passing higher costs on to consumers or downstream

firms. Concerns that firms have difficulty adjusting to higher energy prices appear less relevant at the aggregate level, which strengthens the case for carbon pricing policies. Nonetheless, more adverse impacts to certain sectors or localities could occur if shocks are stronger and more persistent, suggesting the need for using a mix of instruments to accelerate the green transition.

- *Both policy design and implementation matter.* Fiscal incentives, in addition to higher carbon pricing, can encourage firms to invest. Policies need to be well communicated, including their horizon, their coverage, and the eligibility criteria for incentives, to provide certainty to firms in regard to the intended policies; otherwise, policy uncertainty could hamper investment (Berestycki and others 2022). Targeting can help minimize fiscal costs because some energy-intensive firms would have engaged in the same level of investment in green technologies even without fiscal incentives.

Conclusion

Climate action is an urgent global imperative, presenting policymakers with a fundamental trilemma between achieving climate goals, fiscal sustainability, and political feasibility. Prolonging the business-as-usual path and taking only moderate action will not contain global warming, leaving the world vulnerable to potential catastrophic consequences. The time to act is now, with a strong, clear, and concerted mix of policy efforts on the part of governments. Relying mostly on spending-based policies to achieve the net-zero-emissions goal will lead to fast-rising debt beyond the currently projected rising path, exacerbating risks to fiscal sustainability. Relying solely on carbon pricing to reach net zero, on the other hand, is likely to be politically unpalatable.

This chapter offers new insights to navigate this trilemma, recognizing that policymakers will need to strike a balance when crafting an optimal policy package. Achieving these joint goals will

require a carefully calibrated mix of revenue- and spending-based mitigation instruments that involves carbon pricing—necessary but not sufficient to reach the net-zero-emission goals—and other complementary measures, such as transfers, green subsidies and investment, and regulatory measures. The optimal mix varies across countries. Evidence presented on firms' investment responses and resilience to recent energy price shocks also strengthens the case for using a mix of policies to facilitate decarbonization.

Climate policies to decarbonize economies will likely entail a net fiscal cost, which varies considerably across countries depending on size of investment needs, revenues from carbon pricing, and borrowing costs. Advanced economies with sufficient fiscal space could likely accommodate a small increase in debt if needed. Yet many emerging market and developing economies with high debt will find it more challenging to accommodate rising debt, especially as many face pressing priorities for climate adaptation and other development goals. This calls for action to enhance domestic revenue mobilization and improve spending efficiency, combined with efforts to catalyze private financing and undertake structural reforms to accelerate growth.

Addressing climate change involves a collective responsibility to ensure a sustainable, thriving, and resilient world. No single country can tackle it alone. Policymakers must coordinate their efforts by setting minimum carbon prices, removing trade barriers, avoiding costly subsidy races, and developing an international architecture to crowd-in private financing. Facilitating access to established low-carbon technologies and developing strong institutions in emerging market and developing economies can accelerate adoption and narrow technology gaps. Financial support for low-income countries will be crucial to meet their sizable development needs and enable them to cope with climate change. The IMF's Resilience and Sustainability Trust provides long-term financing that can help emerging market and developing economies achieve these goals.

Box 1.1. GDP Impact of Climate Mitigation Policies

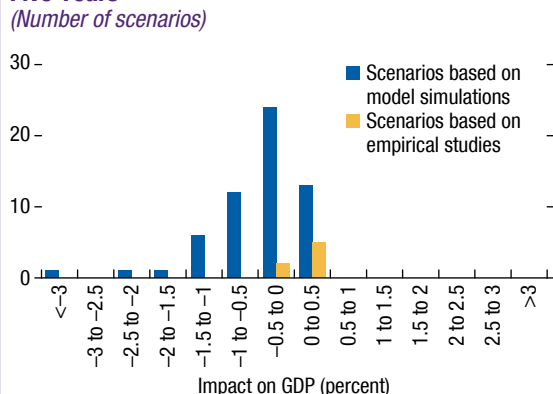
The impact of climate mitigation policies on the overall economy is important for policymakers. Analysis on the effects of climate mitigation policies on GDP and other macroeconomic variables has a long history. Can such policies raise GDP while also reducing emissions (a so-called double dividend) (Bovenberg 1999)? For instance, it has been argued that while carbon pricing increases the cost of energy, which could dampen output in the near term, using carbon revenues to reduce other distortionary taxes on labor or capital could raise output. Such a positive effect could be more likely in countries with large informal sectors, high levels of local air pollution, or low energy efficiency (Heine and Black 2019).

Studies have historically centered on model simulations, from which no consensus has emerged (Patuelli, Nijkamp, and Pels 2005; Freire-González 2018; Köppl and Schratzenstaller 2022). More recently, as an increasing number of countries have implemented climate mitigation policies, empirical evidence has been able to test the effect of carbon pricing on GDP. Figure 1.1.1 shows the estimated impacts on GDP of climate

mitigation policies based on a new meta-analysis of both ex ante (simulation-based results prior to policy implementation) and ex post (empirical post-implementation) studies. Estimates vary across these studies owing to differences in revenue-recycling strategies, reform strength (such as tax rates and emission reductions achieved), country and sectoral coverage, and whether they consider broader endogenous behavioral responses on the part of households and firms. The simulation-based studies show large variation in effects on GDP, which are somewhat skewed toward negative (although small) impacts. By contrast, the small but growing number of empirical studies show a different pattern of mostly positive impacts (Yamazaki 2017; Bernard and Kichian 2021; Metcalf and Stock 2023).

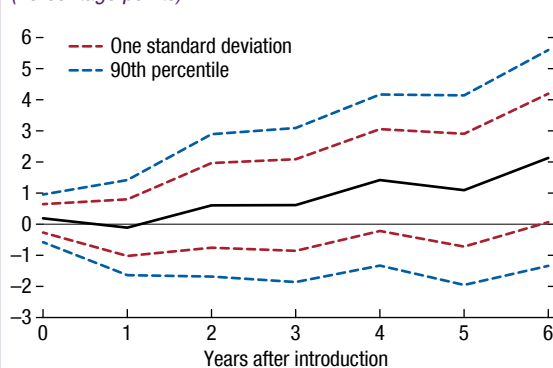
Figure 1.1.2 provides further support for this idea, showing the estimated cumulative impact on GDP from a \$40 carbon price covering 30 percent of national emissions in EU countries during 1990–2019 (see also Metcalf and Stock 2023). The estimates implicitly capture the impact from revenue recycling (Online Annex 1.10). While the confidence intervals are wide, the point estimates suggest that the impact on GDP could be positive during the six years following the reform.

Figure 1.1.1. Meta-analysis: GDP Impact after Five Years
(Number of scenarios)



Source: IMF staff compilations.
Note: “Scenarios based on model simulations” includes all studies based on such simulations, especially those employing competitive general equilibrium models. The figure excludes scenarios that do not include recycling of revenues. Endpoints on horizontal axis are included on the left side of each range.

Figure 1.1.2. Impact of Carbon Prices at \$40 a Ton on Real GDP for EU Countries, 1990–2019
(Percentage points)



Source: IMF staff estimates based on Metcalf and Stock 2023.
Note: The carbon tax covers 30 percent of emissions.

Box 1.2. The Energy Transition of Fossil Fuel-Exporting Countries

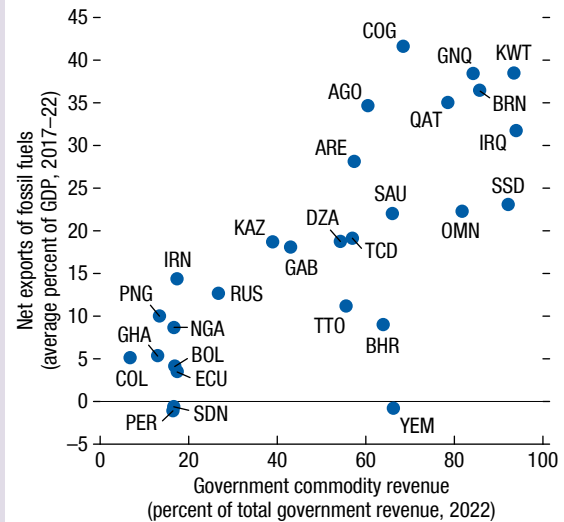
Fossil fuel-exporting countries face additional challenges during the global energy transition. First, the scope they will have for using extractive revenues to finance economic development will be highly sensitive to the pace of global decarbonization efforts. Second, fossil fuel-exporting countries will need to continue to supply adequate volumes of hydrocarbon products as the world tries to lower demand for fossil fuels while safeguarding energy security. Third, they will need to reduce domestic greenhouse gas emissions, including those in extractive industries, to meet their climate targets consistent with the 2015 Paris Agreement (Mesa Puyo and others 2023).

In more than half of fossil fuel-exporting countries, receipts from commodities make up more than half of total fiscal revenues. At the same time, a quarter of these countries have fossil fuel exports greater than 25 percent of GDP (Figure 1.2.1). The fossil fuel-dependent countries are highly concentrated in Africa, the Middle East and Central Asia, and the Western Hemisphere. While some of the largest hydrocarbon producers, such as *Canada, China,* and the *United States,* have more diversified economies and revenue bases, reduced demand for fossil fuels will still affect subnational regions in these countries unevenly, given the way fossil fuel resources are concentrated.

The scope for using revenues from fossil fuel extraction to finance development or economic diversification will be highly sensitive to the global energy transition path (Figure 1.2.2). The model framework in Baunsgaard and Vernon (2023) provides a first approximation of the impact on fossil fuel revenue under various scenarios for the global energy transition outlined in International Energy Agency (2022b): a *stated-policies scenario*, an *announced-pledges scenario*, and a *net zero scenario*.¹ Analyses show that a number of countries are highly

¹In the stated-policies scenario, only current policies and those under development are implemented; oil prices are projected to rise, and demand peaks in 2035. In the announced-pledges scenario, governments achieve their mitigation targets; oil prices are projected to be stable, and demand peaks in 2024. In the net zero scenario, global warming is limited to 1.5 degrees Celsius, and there is no new development in the area of fossil fuels. As a simplifying assumption, GDP is held constant across scenarios. Results are sensitive to the assumptions regarding future prices of and demand for fossil fuels, as well as country-level production (see Baunsgaard and Vernon 2023).

Figure 1.2.1. High Dependence on Commodity Revenues and Exports for Fossil Fuel-Exporting Countries



Sources: IMF, World Economic Outlook database; UN Conference on Trade and Development; and IMF staff calculations.
 Note: Commodity revenue includes all exploitable resources and fossil fuel revenue predominant among surveyed countries. Exports include other related primary products but exclude petrochemicals. Data labels in the figure use International Organization for Standardization (ISO) country codes.

exposed to energy transition risks—for example, 10 countries currently earn more than half of their revenues from fossil fuels and could face at least an 80 percent drop in such revenues by 2040 under the net zero scenario (for example, *Equatorial Guinea, Iraq,* and *Oman*)—and nearly all countries face large declines in revenue by 2030 under the net zero scenario as a result of falling prices of, and demand for, fossil fuels. A slower global energy transition could permit certain fossil fuel producers to increase their market shares on account of relatively lower extraction costs or other comparative advantages (for example, *Iran, Kuwait,* and *Qatar*). While revenue declines in most regions under the announced-pledges scenario, revenues among members of the Organization of the Petroleum Exporting Countries are more resilient, as their collective market share rises over the medium term owing to lower extraction costs, although some face a decline in fossil fuel revenues by 2040. Fiscal policy

Box 1.2 (continued)

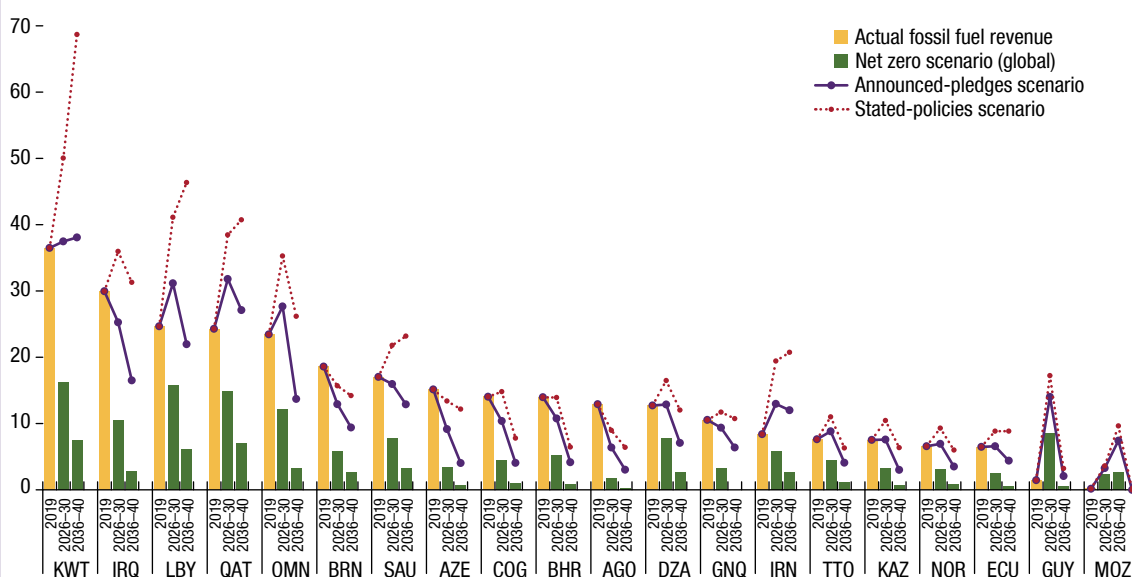
can help address fiscal and economic challenges fossil fuel producers face during the energy transition:

- Fossil fuel producers should withdraw explicit fossil fuel subsidies—which are currently estimated at 5.1 percent of GDP, on average—and gradually phase in emission pricing policies (Black and others 2023a). Methane fees can efficiently reduce emissions in the extractive sector (Parry and others 2022). Carbon pricing provides incentives to switch to lower carbon sources of energy, freeing up hydrocarbons for export markets, which can improve health and generate fiscal revenue.
- Upstream fiscal regimes can be adjusted to shift risks associated with energy transition from investors to government if countries want to attract private investment to extend the life of fossil fuel reserves. Fiscal regimes reliant on profit-based instruments are progressive, as they allocate more risks and upside to the government at the cost of forgoing earlier and more stable revenues from production-based fiscal instruments (royalties). Given existing fiscal regime conditions and revenue

objectives, governments should assess the appropriate mix of production and profit-based instruments to strike a balance between capturing a fair share of rents and securing a reasonable minimum share of revenue from extractive projects.

- National oil companies are key to advancing national policies for the energy transition. As those companies diversify into other businesses, it is important that they manage their balance sheets and associated fiscal risks carefully and that commercial basis drives their investment decisions.
- Fossil fuel producers need to build larger fiscal buffers and strengthen their fiscal frameworks to better manage resource wealth, as they face greater uncertainty during the energy transition. Increased savings of fossil fuel revenue in the near term could be managed under sovereign wealth funds (savings or stabilization funds) to ensure a just transition, promote intergenerational equity, and reduce procyclicality of fiscal policy (IMF 2012; Basdevant, Hooley, and Imamoglu 2021).

Figure 1.2.2. Fiscal Revenues for Select Fossil Fuel Producers under Various Energy Transition Scenarios (Percent of GDP)



Source: IMF staff calculations.

Note: The figure shows selected fossil fuel-producing countries where fossil fuel revenues make the highest contribution to total revenue as well as large new producers such as *Guyana* and *Mozambique*. The outlook in regard to energy markets is based on International Energy Agency (2022b), which considers scenarios involving “stated policies,” “announced pledges,” and net zero emissions. The green bar for the net-zero-policy scenario shows the revenue decline for most countries relative to actual fossil fuel revenues in 2019. The purple and red lines show the revenues generated in the announced-pledges and the stated-policies scenarios. Data labels in the figure use International Organization for Standardization (ISO) country codes.

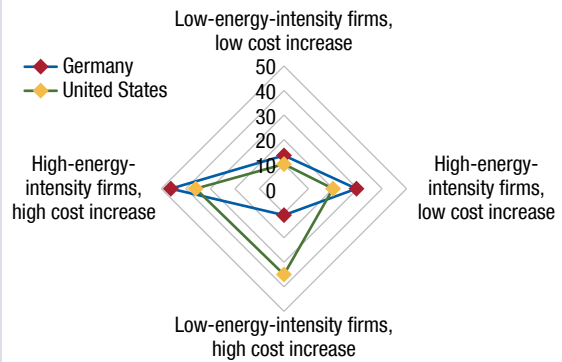
Box 1.3. How Have Firms Responded to Recent Energy Price Shocks?

The speed of the energy transition necessary to achieve the Paris Agreement climate goals has raised concerns that firms could face difficulties in adjusting to higher energy prices. The energy price spikes in 2022, partly driven by *Russia's* invasion of *Ukraine*, provide a natural experiment for assessing whether firms are resilient when energy prices surge and how they adjust to such surges.

Two surveys, one among firms in *Germany* and the other among firms in the *United States*, show that more than three-quarters of firms in each country experienced a rise in their energy costs in 2022, with a higher share of firms in energy-intensive industries reporting an energy price shock (Figure 1.3.1). The increase was much larger in *Germany*, where nearly 20 percent of surveyed firms (four times higher than the share of firms in the *United States*) reported their energy costs as rising by more than 50 percent during 2022. In response, more than 40 percent of the firms surveyed in *Germany* passed on a quarter or more of the cost increase to downstream firms or customers, compared with 36 percent of surveyed firms in the *United States* (Online Annex 1.9).

Less than 10 percent of surveyed firms in the *United States*, where the energy price shock was less acute, reported a cut in production or employment, but an even larger share reported an increase in either or both. The share of surveyed firms reporting a reduction in investment was somewhat higher, but so

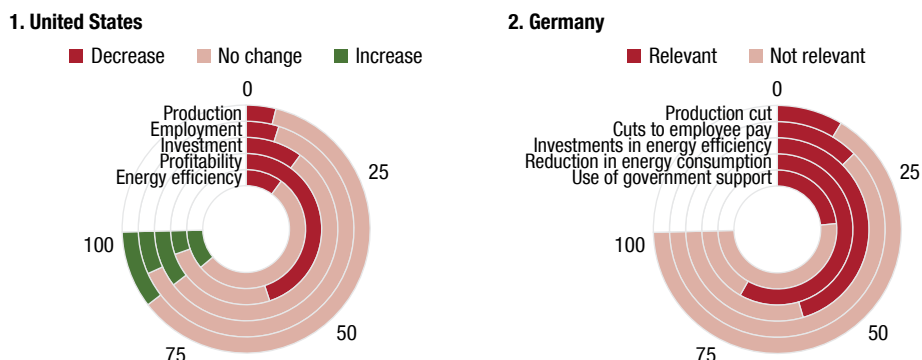
Figure 1.3.1. Firms Experiencing Energy Price Shocks, 2022
(Percent of surveyed firms)



Sources: Business Inflation Expectations Survey (Federal Reserve Bank of Atlanta); Bundesbank Online Panel; CFO Survey (Duke University, Federal Reserve Bank of Atlanta, Federal Reserve Bank of Richmond); and IMF staff estimates.
Note: A large (small) increase in energy costs is defined as an increase of greater (less) than 50 percent in 2022. Firms are classified as high (low) energy intensity if their energy costs are greater (less) than 3 percent of their operational costs.

was the share of firms reporting an increase, with the majority reporting no change (Figure 1.3.2). Although 60 percent of the US firms surveyed reported a reduction in profitability, only 6 percent indicated that profitability had declined significantly. Overall, balance sheets of US firms surveyed seemed to have remained

Figure 1.3.2. Impact of Rise in Energy Cost on Firms' Performance and Investment
(Percent of surveyed firms)



Sources: Business Inflation Expectations Survey (Federal Reserve Bank of Atlanta); Bundesbank Online Panel; CFO Survey (Duke University, Federal Reserve Bank of Atlanta, and Federal Reserve Bank of Richmond); and IMF staff estimates.
Note: The figure shows the proportion of firms experiencing a rise in energy costs that indicated a change in output, employment, investment, profitability, energy consumption, energy efficiency, or the use of government support measures (See Online Annex 1.9).

Box 1.3 (continued)

resilient to the energy price shock. Most firms that responded to the survey did not respond to higher energy prices by improving their energy efficiency.

This is in sharp contrast to what surveyed firms in *Germany* reported. In the face of a larger energy price shock (almost a doubling of nonresidential electricity prices relative to 2021 levels), 60 percent of surveyed firms in *Germany* reported investing or planning to invest in energy efficiency; and more than three-quarters reducing or planning to reduce their energy consumption. Somewhat surprisingly, only

12 percent of the responding firms reported an output loss. Hence, most surveyed firms in *Germany* were resilient by improving energy efficiency and reducing energy consumption. Differences between *Germany* and the *United States* may be attributable to the size and the perceived persistence of the shock or the level of government support received. For example, firms in *Germany* may have considered the energy price shock to be longer lasting and hence warranting investment in energy efficiency. Potential disruptions to firms could be larger if the shocks were more persistent.

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ECONOMY ABBREVIATIONS

Code	Name	Code	Name
AFG	Afghanistan	DNK	Denmark
AGO	Angola	DOM	Dominican Republic
ALB	Albania	DZA	Algeria
AND	Andorra	ECU	Ecuador
ARE	United Arab Emirates	EGY	Egypt
ARG	Argentina	ERI	Eritrea
ARM	Armenia	ESP	Spain
ATG	Antigua and Barbuda	EST	Estonia
AUS	Australia	ETH	Ethiopia
AUT	Austria	FIN	Finland
AZE	Azerbaijan	FJI	Fiji
BDI	Burundi	FRA	France
BEL	Belgium	FSM	Micronesia, Federated States of
BEN	Benin	GAB	Gabon
BFA	Burkina Faso	GBR	United Kingdom
BGD	Bangladesh	GEO	Georgia
BGR	Bulgaria	GHA	Ghana
BHR	Bahrain	GIN	Guinea
BHS	Bahamas, The	GMB	Gambia, The
BIH	Bosnia and Herzegovina	GNB	Guinea-Bissau
BLR	Belarus	GNQ	Equatorial Guinea
BLZ	Belize	GRC	Greece
BOL	Bolivia	GRD	Grenada
BRA	Brazil	GTM	Guatemala
BRB	Barbados	GUY	Guyana
BRN	Brunei Darussalam	HKG	Hong Kong Special Administrative Region
BTN	Bhutan	HND	Honduras
BWA	Botswana	HRV	Croatia
CAF	Central African Republic	HTI	Haiti
CAN	Canada	HUN	Hungary
CHE	Switzerland	IDN	Indonesia
CHL	Chile	IND	India
CHN	China	IRL	Ireland
CIV	Côte d'Ivoire	IRN	Iran
CMR	Cameroon	IRQ	Iraq
COD	Congo, Democratic Republic of the	ISL	Iceland
COG	Congo, Republic of	ISR	Israel
COL	Colombia	ITA	Italy
COM	Comoros	JAM	Jamaica
CPV	Cabo Verde	JOR	Jordan
CRI	Costa Rica	JPN	Japan
CYP	Cyprus	KAZ	Kazakhstan
CZE	Czech Republic	KEN	Kenya
DEU	Germany	KGZ	Kyrgyz Republic
DJI	Djibouti	KHM	Cambodia
DMA	Dominica	KIR	Kiribati

Code	Name	Code	Name
KNA	St. Kitts and Nevis	ROU	Romania
KOR	Korea	RUS	Russian Federation
KWT	Kuwait	RWA	Rwanda
LAO	Lao P.D.R.	SAU	Saudi Arabia
LBN	Lebanon	SDN	Sudan
LBR	Liberia	SEN	Senegal
LBY	Libya	SGP	Singapore
LCA	St. Lucia	SLB	Solomon Islands
LKA	Sri Lanka	SLE	Sierra Leone
LSO	Lesotho	SLV	El Salvador
LTU	Lithuania	SMR	San Marino
LUX	Luxembourg	SOM	Somalia
LVA	Latvia	SRB	Serbia
MAR	Morocco	SSD	South Sudan
MDA	Moldova	STP	São Tomé and Príncipe
MDG	Madagascar	SUR	Suriname
MDV	Maldives	SVK	Slovak Republic
MEX	Mexico	SVN	Slovenia
MHL	Marshall Islands	SWE	Sweden
MKD	North Macedonia	SWZ	Eswatini
MLI	Mali	SYC	Seychelles
MLT	Malta	SYR	Syria
MMR	Myanmar	TCD	Chad
MNE	Montenegro	TGO	Togo
MNG	Mongolia	THA	Thailand
MOZ	Mozambique	TJK	Tajikistan
MRT	Mauritania	TKM	Turkmenistan
MUS	Mauritius	TLS	Timor-Leste
MWI	Malawi	TON	Tonga
MYS	Malaysia	TTO	Trinidad and Tobago
NAM	Namibia	TUN	Tunisia
NER	Niger	TUR	Türkiye
NGA	Nigeria	TUV	Tuvalu
NIC	Nicaragua	TWN	Taiwan Province of China
NLD	Netherlands, The	TZA	Tanzania
NOR	Norway	UGA	Uganda
NPL	Nepal	UKR	Ukraine
NRU	Nauru	URY	Uruguay
NZL	New Zealand	USA	United States
OMN	Oman	UZB	Uzbekistan
PAK	Pakistan	VCT	St. Vincent and the Grenadines
PAN	Panama	VEN	Venezuela
PER	Peru	VNM	Vietnam
PHL	Philippines	VUT	Vanuatu
PLW	Palau	WSM	Samoa
PNG	Papua New Guinea	YEM	Yemen
POL	Poland	ZAF	South Africa
PRT	Portugal	ZMB	Zambia
PRY	Paraguay	ZWE	Zimbabwe
QAT	Qatar		

GLOSSARY

Adaptation¹ The process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

Ambition gap¹ A gap between emission pledges and emission reduction pathways consistent with 1.5–2°C.

Border carbon adjustment Levy charged on the unpriced carbon emissions embodied in imports (perhaps with remittances for domestic carbon taxes on exports).

Business as usual (BAU)¹ Scenarios that are based on the assumption that no mitigation policies or measures will be implemented beyond those that are already in force and/or are legislated or planned to be adopted. Equivalent to no policy scenario.

Carbon dioxide (CO₂) The main greenhouse gas, produced from burning fossil fuels, manufacturing cement, and forest practices. CO₂ has an average atmospheric residence time of 100 years.

Carbon dioxide capture and storage¹ A process in which a relatively pure stream of carbon dioxide (CO₂) from industrial and energy-related sources is separated (captured), conditioned, compressed and transported to a storage location for long-term isolation from the atmosphere.

Carbon leakage Changes in sectoral emissions arising from moving production to countries with laxer emission standards.

Carbon price¹ The price for avoided or released carbon dioxide (CO₂) or CO₂-equivalent emissions. This may refer to the rate of a carbon tax, or the price of emission permits.

Carbon tax A tax imposed on CO₂ releases emitted largely through the combustion of carbon-based fossil fuels. Administratively, the easiest way

to implement the tax is through taxing the supply of fossil fuels—coal, oil, and natural gas—in proportion to their carbon content.

Climate target¹ Climate target refers to a temperature limit, concentration level, or emissions reduction goals by a certain amount over a given time horizon.

Contingent liabilities Obligations that are not explicitly recorded on government balance sheets and that arise only in the event of a particular discrete situation, such as a crisis.

Cyclically adjusted balance (CAB) Difference between the overall balance and the automatic stabilizers; equivalently, an estimate of the fiscal balance that would apply under current policies if output were equal to potential.

Cyclically adjusted primary balance (CAPB) Cyclically adjusted balance excluding net interest payments (interest expenditure minus interest revenue).

Decarbonization The process by which countries, individuals, or other entities aim to achieve zero fossil carbon existence. Typically refers to a reduction of the carbon emissions associated with electricity, industry, and transport.

Emissions-trading system A market-based policy to reduce emissions (sometimes referred to as cap-and-trade). Covered sources are required to hold allowances for each ton of their emissions or (in an upstream program) the embodied emissions content in fuels. The total quantity of allowances is fixed, and market trading of allowances establishes a market price for emissions. Auctioning the allowances provides a valuable source of government revenue.

Externality A cost imposed by the actions of individuals or firms on other individuals or firms (possibly in the future, as in the case of climate change) that the former does not consider.

Feebate This policy would impose a sliding scale of fees on firms with emission rates (for example,

¹ Definition obtained from the Intergovernmental Panel on Climate Change (<https://apps.ipcc.ch/glossary/>).

CO₂ per kilowatt-hour) above a “pivot point” level and corresponding subsidies for firms with emission rates below the pivot point. Alternatively, the feebate might be applied to energy consumption rates (for example, gasoline per mile driven) rather than emission rates. Feebates can exploit many (but not all) of the mitigation opportunities promoted by carbon taxes but without a large increase in energy prices.

Fiscal buffer Fiscal space created by saving budgetary resources and reducing public debt in good times.

Fiscal consolidation Fiscal policy that reduces government deficits and government debt.

Fiscal framework The set of rules, procedures, and institutions that guide fiscal policy.

Fiscal space The room for undertaking discretionary fiscal policy (increasing spending or reducing taxes) relative to existing plans without endangering market access and debt sustainability.

General government All government units and all nonmarket, nonprofit institutions that are controlled and mainly financed by government units comprising the central, state, and local governments; includes social security funds and does not include public corporations or quasi corporations.

Government financing needs (also *Gross financing needs*) Overall new borrowing requirement plus debt maturing during the year.

Government credit guarantees Governments can undertake payment of a debt or liabilities in the event of a default by the primary creditor. The most common type is a government-guaranteed loan, which requires government to repay any amount outstanding on a loan in the event of default. In some contracts, governments provide a revenue or demand guarantee. The budget costs related to guarantees are usually not recognized in the budget without any upfront cost, but they create a contingent liability, with the government exposed to future calls on guarantees and fiscal risks.

Greenhouse gas A gas in the atmosphere that is transparent to incoming solar radiation but traps and absorbs heat radiated from the earth. CO₂ is easily the most predominant greenhouse gas.

Green industrial policies Policies to promote low-carbon technologies through targeted measures, such as subsidies and tax incentives on specific domestic firms, industries, sectors, or regions.

Green subsidies/investment Subsidies/investment to support environmentally friendly technologies, practices, and behaviors.

Green transition Transition to net zero emissions. See *Net zero emissions*

Gross debt All liabilities that require future payment of interest and/or principal by the debtor to the creditor. This includes debt liabilities in the form of special drawing rights, currency, and deposits; debt securities; loans; insurance, pension, and standardized guarantee programs; and other accounts payable. (See the IMF’s 2001 *Government Finance Statistics Manual* and *Public Sector Debt Statistics Manual*.) The term “public debt” is used in the *Fiscal Monitor*, for simplicity, as synonymous with gross debt of the general government, unless specified otherwise. (Strictly speaking, public debt refers to the debt of the public sector as a whole, which includes financial and nonfinancial public enterprises and the central bank.)

Gross financing needs See *Government financing needs*

Headline fiscal balance See *Overall fiscal balance*

Just transition Measures to provide support for households and firms to ensure a fair distribution of costs and benefits as a part of comprehensive mitigation strategy.

Mitigation¹ A human intervention to reduce emissions or enhance the sinks of greenhouse gases, including carbon dioxide removal options.

Nationally Determined Contribution (NDC) Climate strategies, including mitigation commitments, submitted by 190 parties for the Paris Agreement. Countries are required to report progress on implementing NDCs every two years and, since 2020, to submit revised NDCs (which are expected to contain progressively more stringent mitigation pledges) every five years.

Net debt Gross debt minus financial assets corresponding to debt instruments. These financial assets are monetary gold and special drawing rights;

¹ Definition obtained from the Intergovernmental Panel on Climate Change (<https://apps.ipcc.ch/glossary/>).

currency and deposits; debt securities; loans, insurance, pensions, and standardized guarantee programs; and other accounts receivable. In some countries, the reported net debt can deviate from this definition based on available information and national fiscal accounting practices.

Net (financial) worth Net worth is a measure of fiscal solvency. It is calculated as assets minus liabilities. Net financial worth is calculated as financial assets minus liabilities.

Network externality Occurs when additional infrastructure needed for one investor (for example, to connect a remote renewables site to the power grid) could potentially benefit other firms.

Net zero emissions¹ Balance at a global scale of residual carbon dioxide emissions with the same amount of carbon dioxide removal.

Nonfinancial public sector General government plus nonfinancial public corporations.

Overall fiscal balance (also *Headline fiscal balance*) Net lending and borrowing, defined as the difference between revenue and total expenditure, using the IMF's 2001 *Government Finance Statistics Manual* (GFSM 2001). Does not include policy lending. For some countries, the overall balance is still based on the GFSM 1986, which defines it as total revenue and grants minus total expenditure and net lending.

Paris Agreement An international accord (ratified in 2016) on climate mitigation, adaptation, and finance. The Agreement's central objective is to contain global average temperature increases to 1.5–2°C above preindustrial levels.

Price subsidies Price subsidies are measure that keep prices for end users below market levels, or for suppliers above market levels. Subsidies can take various forms including direct transfers, but also indirect support such as tax exemptions, price controls, or rebates.

Primary balance Overall balance excluding net interest payments (interest expenditure minus interest revenue).

Progressive (or regressive) taxes Taxes that feature an average tax rate that rises (or falls) with income.

¹ Definition obtained from the Intergovernmental Panel on Climate Change (<https://apps.ipcc.ch/glossary/>).

Public debt See *Gross debt*

Public sector Includes all resident institutional units that are deemed to be controlled by the government. It includes general government and resident public corporations.

Research and development Innovative activities undertaken by corporations or governments in developing new products or technologies.

Revenue recycling Use of (carbon) tax revenues to, for example, lower other taxes on households and firms or fund public investments.

Shadow carbon price The social cost of emitting a marginal ton of carbon or the social benefit of abating a ton of carbon.

Social protection The social protection system consists of policies designed to reduce individuals' exposures to risks and vulnerabilities and to enhance their capacity to manage negative shocks such as unemployment, sickness, poverty, disability, and old age. It has three broad categories: (1) social safety net programs (noncontributory transfer programs to ensure a minimum level of economic well-being); (2) social insurance programs (contributory interventions to help people better manage risks), and (3) labor market programs to insure individuals against unemployment risks and improve job search prospects.

Social safety nets Noncontributory transfer programs financed by general government revenue.

Stock-flow adjustments Change in the gross debt explained by factors other than the overall fiscal balance (for example, valuation changes).

Stranded assets¹ Assets exposed to devaluations or conversion to 'liabilities' because of unanticipated changes in their initially expected revenues due to innovations and/or evolutions of the business context, including changes in public regulations at the domestic and international levels.

Structural primary balance Extension of the cyclically adjusted primary balance that also corrects for other nonrecurrent effects that go beyond the cycle, such as one-off operations and other factors whose cyclical fluctuations do not coincide with the output cycle (for instance, asset and commodity prices and output composition effects).

Sustainable Development Goals A collection of 17 goals set by the United Nations General Assembly in 2015 covering global warming, poverty, health, education, gender equality, water, sanitation, energy, urbanization, environment, and social justice. Each goal has a set of targets to achieve, and in total there are 169 targets.

Tipping point A level of change in system properties beyond which a system reorganizes, often abruptly, and does not return to the initial state even

if the drivers of the change are abated. For the climate system, it refers to a critical threshold when global or regional climate changes from one stable state to another stable state.

Tradable performance standards Requirement to meet an emissions-per-unit-of-output performance standard, for example, for the average carbon emissions per kilowatt hour across power generation plants or per ton of steel.

METHODOLOGICAL AND STATISTICAL APPENDIX

This appendix comprises four sections. “Data and Conventions” describes the data and conventions used to calculate economy group composites. “Fiscal Policy Assumptions” summarizes the country-specific assumptions underlying the estimates and projections for 2023–28. “Definition and Coverage of Fiscal Data” summarizes the classification of countries in the various groups presented in the *Fiscal Monitor* and details the coverage and accounting practices underlying each country’s *Fiscal Monitor* data. Statistical tables on key fiscal variables complete the appendix. Data in these tables have been compiled on the basis of information available through September 29, 2023.

Data and Conventions

Country-specific data and projections for key fiscal variables are based on the October 2023 World Economic Outlook database, unless indicated otherwise, and compiled by the IMF staff. Historical data and projections are based on the information IMF country desk officers gather in the context of their missions and through their ongoing analysis of the evolving situation in each country; data are updated continually as more information becomes available. Structural breaks in data may be adjusted to produce smooth series through splicing and other techniques. IMF staff estimates serve as proxies when complete information is unavailable. As a result, *Fiscal Monitor* data may differ from official data in other sources, including the IMF’s *International Financial Statistics* and the *Government Finance Statistics Manual* (GFSM 2014).

Sources for fiscal data and projections not covered by the World Economic Outlook database are listed in the respective tables and figures.

Country classification in the *Fiscal Monitor* divides the world into three major groups: 41 advanced economies, 95 emerging market and middle-income economies, and 59 low-income developing countries. *Fiscal Monitor* tables display 37 advanced economies, 39 emerging market and middle-income economies, and 40 low-income developing countries. The countries in the tables generally represent the largest

countries within each group based on the size of their GDP in current US dollars. Data for the full list of economies can be found at <https://www.imf.org/external/datamapper/datasets/FM>. The seven largest advanced economies as measured by GDP (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) 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 membership has increased over time. Data for most European Union member countries have been revised following their adoption of the updated European System of National and Regional Accounts (ESA 2010). Low-income developing countries are countries that have per capita income levels below a certain threshold (set at \$2,700, as of 2016, as measured by the World Bank Atlas method), structural features consistent with limited development and structural transformation, and external financial relationships insufficiently open for the countries to be considered emerging market economies. Emerging market and middle-income economies include those not classified as advanced economies or low-income developing countries. See Table A, “Economy Groupings,” for more details.

Most fiscal data for advanced economies refer to the general government, whereas data for emerging market and developing economies often refer to only the central government or the budgetary central government (for specific details, see Tables B–D). All fiscal data refer to calendar years, except in the cases of The Bahamas, Bangladesh, Barbados, Bhutan, Botswana, Dominica, Egypt, Eswatini, Ethiopia, Fiji, Haiti, Hong Kong Special Administrative Region, India, the Islamic Republic of Iran, Jamaica, Lesotho, Malawi, the Marshall Islands, Mauritius, Micronesia, Myanmar, Namibia, Nauru, Nepal, Pakistan, Palau, Puerto Rico, Rwanda, Samoa, Singapore, St. Lucia, Thailand, Tonga, and Trinidad and Tobago, for which they refer to the fiscal year. For economies whose fiscal years end before June 30, data are recorded in the previous calendar year. For economies whose fiscal

years end on or after June 30, data are recorded in the current calendar year.

Composite data for country groups are weighted averages of individual-country data, unless specified otherwise. Data are weighted by annual nominal GDP converted to US dollars at average market exchange rates as a share of the group GDP.

For the purpose of data reporting in the *Fiscal Monitor*, the Group of Twenty member aggregate refers to the 19 country members and does not include the European Union.

In most advanced economies, and in some large emerging market and middle-income economies, fiscal data follow the GFSM 2014 or are produced using a national accounts methodology that follows the 2008 System of National Accounts (SNA) or ESA 2010, both broadly aligned with the GFSM 2014. Most other countries follow the GFSM 2001, but some countries, including a significant proportion of low-income developing countries, have fiscal data based on the GFSM 1986. The overall fiscal balance refers to net lending and borrowing by the general government. In some cases, however, the overall balance refers to total revenue and grants minus total expenditure and net lending.

The fiscal gross and net debt data reported in the *Fiscal Monitor* are drawn from official data sources and IMF staff estimates. Whereas attempts are made to align gross and net debt data with the definitions in the GFSM, data limitations or specific country circumstances can cause these data to deviate from the formal definitions. Although every effort is made to ensure the debt data are relevant and internationally comparable, differences in both sectoral and instrument coverage mean that the data are not universally comparable. As more information becomes available, changes in either data sources or instrument coverage can give rise to data revisions that are sometimes substantial.

As used in the *Fiscal Monitor*, the term “country” does not always refer to a territorial entity that is a state as understood by international law and practice. As used here, “country” also covers some territorial entities that are not states but whose statistical data are maintained separately and independently.

Australia: For cross-economy comparability, gross and net debt levels reported by national statistical agencies for economies that have adopted the

2008 SNA (Australia, Canada, Hong Kong Special Administrative Region, and the United States) are adjusted to exclude the unfunded pension liabilities of government employees defined-benefit pension plans.

Bangladesh: Data are on a fiscal year basis.

Brazil: The Brazil team is transitioning to GFSM 2014, with adjustments for the period 2001–2009. Municipalities’ primary balances follow below-the-line borrowing requirements from 2001 to 2022. Accrual data for non-interest revenues are not available. Gross public debt includes the Treasury bills on the central bank’s balance sheet, including those not used under repurchase agreements. Net public debt consolidates nonfinancial public sector and central bank debt. The authorities’ definition of general government gross debt excludes government securities held by the central bank, except the stock of Treasury securities the central bank uses for monetary policy (those pledged as security reverse repurchase agreement operations). According to the authorities’ definition, gross debt amounted to 72.9 percent of GDP at the end of 2022.

Canada: For cross-economy comparability, gross and net debt levels reported by national statistical agencies for economies that have adopted the 2008 SNA (Australia, Canada, Hong Kong Special Administrative Region, and the United States) are adjusted to exclude unfunded pension liabilities of government employees, defined-benefit pension plans. Canada’s net debt corresponds to net financial liabilities as reported by Statistics Canada and includes equity and investment fund shares, which Canada has built up substantially. Statistics Canada has made a recent methodological change to value assets at market value instead of book value, which has decreased net debt.

Chile: Cyclically adjusted balances refer to the structural balance, which includes adjustments for output and commodity price developments.

China: Deficit and public debt numbers cover a narrower perimeter of the general government than IMF staff estimates in China Article IV reports (see IMF 2023 for a reconciliation of the two estimates). Public debt data include central government debt as reported by the Ministry of Finance, explicit local government debt, and shares of contingent liabilities the government may incur, based on estimates from the National Audit Office estimate.

- IMF staff estimates exclude central government debt issued for China Railway. Relative to the authorities' definition, consolidated general government net borrowing excludes transfers to and from stabilization funds but includes state-administered funds, state-owned enterprise funds, and social security contributions and expenses as well as some off-budget spending by local governments. Deficit numbers do not include some expenditure items, mostly infrastructure investment financed off budget through land sales and local government financing vehicles. Fiscal balances are not consistent with reported debt because no time series of data in line with the National Audit Office debt definition is published officially.
- Colombia:* Gross public debt refers to the combined public sector, including Ecopetrol and excluding Banco de la República's outstanding external debt.
- Dominican Republic:* The fiscal series have the following coverage: The public debt, debt service, and cyclically adjusted or structural balances are for the consolidated public sector (which includes the central government, the rest of the nonfinancial public sector, and the central bank). The remaining fiscal series are for the central government.
- Egypt:* Data are on a fiscal year basis.
- Ethiopia:* Data are on a fiscal year basis. Gross debt refers to the nonfinancial public sector, excluding Ethiopian Airlines.
- Fiji:* Data are on a fiscal year basis.
- Greece:* General government gross debt follows the GFSM 2014 definition and includes the stock of deferred interest.
- Haiti:* Data are on a fiscal year basis.
- Hong Kong Special Administrative Region:* Data are on a fiscal year basis. Cyclically adjusted balances include adjustments for land revenue and investment income. For cross-economy comparability, gross and net debt levels reported by national statistical agencies for economies that have adopted the 2008 SNA (Australia, Canada, Hong Kong Special Administrative Region, and the United States) are adjusted to exclude the unfunded pension liabilities of government employees defined-benefit pension plans.
- Iceland:* Gross debt excludes insurance technical reserves (including pension liabilities) and other accounts payable.
- India:* Data are on a fiscal year basis.
- Islamic Republic of Iran:* Data are on a fiscal year basis.
- Ireland:* For 2015, if the conversion of the government's remaining preference shares to ordinary shares in one bank is excluded, then the fiscal balance is -1.1 percent of GDP. Cyclically adjusted balances reported in Tables A3 and A4 exclude financial sector support measures. Ireland's 2015 national accounts were revised as a result of restructuring and relocation of multinational companies, which resulted in a level shift of nominal and real GDP. For more information, see "National Income and Expenditure Annual Results: 2015," <http://www.cso.ie/en/releasesandpublications/er/nie/nationalincomeandexpenditureannualresults2015/>.
- Japan:* Gross debt is on an unconsolidated basis.
- Mexico:* General government refers to the central government, social security funds, public enterprises, development banks, the national insurance corporation, and the National Infrastructure Fund but excludes subnational governments.
- Myanmar:* Data are on a fiscal year basis.
- Nepal:* Data are on a fiscal year basis.
- Norway:* Cyclically adjusted balances correspond to the cyclically adjusted non-oil overall or primary balance. These variables are a percentage of non-oil potential GDP.
- Pakistan:* Data are on a fiscal year basis.
- Peru:* Cyclically adjusted balances include adjustments for commodity price developments.
- Singapore:* Data are on a fiscal year basis.
- Spain:* Overall and primary balances include financial sector support measures estimated to be 0.3 percent of GDP for 2013, 0.1 percent of GDP for 2014, 0.1 percent of GDP for 2015, and 0.2 percent of GDP for 2016.
- Sweden:* Cyclically adjusted balances account for output and employment gaps.
- Switzerland:* Data submissions at the cantonal and commune levels may be subject to sizable revisions. Cyclically adjusted balances include adjustments for extraordinary operations related to the banking sector.
- Thailand:* Data are on a fiscal year basis.
- Türkiye:* Projections in the *Fiscal Monitor* are based on the IMF-defined fiscal balance, which excludes some revenue and expenditure items included in the authorities' headline balance.
- Turkmenistan:* IMF staff 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, which are compiled using domestic statistical methodologies, include bond issuance and privatization proceeds as part of government revenues.

United States: For cross-economy comparability, expenditures and fiscal balances are adjusted to exclude the imputed interest on unfunded pension liabilities and the imputed compensation of employees, which are counted as expenditures under the 2008 SNA adopted by the United States. Data for the United States may thus differ from data published by the US Bureau of Economic Analysis. In addition, gross and net debt levels reported by the Bureau of Economic Analysis and national statistical agencies for other economies that have adopted the 2008 SNA (Australia, Canada, and Hong Kong Special Administrative Region) are adjusted to exclude the unfunded pension liabilities of government employees defined-benefit pension plans.

Uruguay: 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 2018–22 are affected by these transfers, which amounted to 1.2 percent of GDP in 2018, 1.1 percent of GDP in 2019, 0.6 percent of GDP in 2020, and 0.3 percent of GDP in 2021 and are projected to be 0.1 percent of GDP in 2022 and 0 percent thereafter. See IMF Country Report 19/64 for further details. 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 *World Economic Outlook*. 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.

Venezuela: Fiscal accounts include the budgetary central government, social security funds, FOGADE (insurance deposit institution), and a sample of public enterprises, including Petróleos de Venezuela, S.A. (PDVSA). Data for 2018–22 are IMF staff estimates.

Fiscal Policy Assumptions

Historical data and projections of key fiscal aggregates are in line with those of the October 2023 *World Economic Outlook*, unless noted otherwise. For underlying assumptions other than on fiscal policy, see the October 2023 *World Economic Outlook*.

Short-term fiscal policy assumptions are based on officially announced budgets, adjusted for differences between the national authorities and the IMF staff regarding macroeconomic assumptions and projected fiscal outturns. Medium-term fiscal projections incorporate policy measures judged likely to be implemented. When the IMF staff have insufficient information to assess the authorities' budget intentions and prospects for policy implementation, an unchanged structural primary balance is assumed, unless indicated otherwise.

Afghanistan: All data and projections for 2022–28 are omitted because of an unusually high degree of uncertainty and 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.

Algeria: Starting with the October 2022 *Regional Economic Outlook: Middle East and Central Asia*, total government expenditure and net lending/borrowing include policy lending by the government which mostly reflects support to the pension system and other public sector entities.

Argentina: Fiscal projections are based on the available information regarding budget outturn, budget plans, and IMF-supported program targets for the federal government; on fiscal measures announced by the

- authorities; and on the IMF staff's macroeconomic projections.
- Australia:* Fiscal projections are based on data from the Australian Bureau of Statistics, the fiscal year (FY)2023/24 budget published by the Commonwealth Government and the respective state/territory governments, and the IMF staff's estimates and projections.
- Austria:* Fiscal projections are based on the 2023 Stability Programme. The NextGenerationEU fund has also been incorporated.
- Belgium:* Projections are based on the Belgian Stability Program 2023–26, the 2023 Budgetary Plan, and other available information on the authorities' fiscal plans, with adjustments for the IMF staff's assumptions.
- Brazil:* Fiscal projections for 2023 reflect the current policy in place.
- Cambodia:* Historical fiscal and monetary data are from the Cambodian authorities. Projections are based on the IMF staff's assumptions given discussions with the authorities.
- Canada:* Projections use the baseline forecasts from the Government of Canada's Budget 2023 and the latest provincial budgets. The IMF staff make some adjustments to these forecasts, including those for differences in macroeconomic projections. The IMF staff's forecast also incorporates the most recent data releases from Statistics Canada's National Economic Accounts, including quarterly federal, provincial, and territorial budgetary outturns.
- Chile:* Projections are based on the authorities' budget projections, adjusted to reflect the IMF staff's projections for GDP, copper prices, depreciation, and inflation.
- China:* The IMF staff's fiscal projections incorporate the 2023 budget as well as estimates of off-budget financing.
- Colombia:* Projections are based on the authorities' policies and projections reflected in the 2023 Financing Plan and the 2023–2034 Medium-Term Fiscal Framework, adjusted to reflect the IMF staff's macroeconomic assumptions.
- Croatia:* Projections are based on macro framework and authorities' medium-term fiscal guidelines.
- Cyprus:* Projections are based on the IMF staff's assessment of authorities' budget plans and the IMF staff's macroeconomic assumptions.
- Czech Republic:* The fiscal projections are based on the authorities' latest-available convergence program, budget and medium-term fiscal framework as well as the IMF staff's macroeconomic framework. Structural balances are net of temporary fluctuations in some revenues and one-offs. COVID-19–related one-offs are, however, included.
- 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).
- Egypt:* Fiscal projections are mainly based on budget sector operations. Projections are based on the budget for FY2022/23 and the IMF's macroeconomic outlook.
- Estonia:* The forecast incorporates the authorities' Budget for 2023, adopted tax changes, recent developments, and staff's macroeconomic assumptions.
- Finland:* Fiscal projections are based on the authorities' projections which reflect their latest medium-term fiscal plan, adjusting where appropriate for the IMF staff's macroeconomic and other assumptions.
- France:* Projections for 2023 onward are based on the 2018–23 budget laws, the 2023 amending social security finance bill, Stability Program 2023–27, the draft medium-term programming bill, and other available information on the authorities' fiscal plans, adjusted for differences in revenue projections and assumptions on macroeconomic and financial variables.
- Ghana:* Government debt and interest rate projections are based on a pre-debt restructuring scenario.
- Germany:* The IMF staff's projections for 2023 and beyond are based on the 2023 budget, the 2023 Stability Programme, the draft 2024 federal budget, the federal government's medium-term budget plan, and data updates from the national statistical agency (Destatis) and the ministry of finance, adjusted for differences in the IMF staff's

- macroeconomic framework and assumptions concerning revenue elasticities.
- Greece:* Data since 2010 reflect adjustments in line with the primary balance definition under the enhanced surveillance framework for Greece.
- Hong Kong Special Administrative Region:* Projections are based on the authorities' medium-term fiscal projections for expenditures.
- Hungary:* Fiscal projections include the IMF staff's projections of the macroeconomic framework and fiscal policy plans announced in the 2023 and 2024 budgets.
- India:* Projections are based on available information on the authorities' fiscal plans, with adjustments for the IMF staff's assumptions. Data for states are incorporated with a lag of up to one year. General government data do not include local government, though available estimates suggest the effect of this on the fiscal deficit and debt is small. IMF and Indian presentations differ, particularly regarding disinvestment and license-auction proceeds, net versus gross recording of revenues in certain minor categories, and some public sector lending. Starting with FY2020/21 data, expenditure also includes the off-budget component of food subsidies, consistent with the revised treatment of food subsidies in the budget. The IMF staff adjust expenditure to take out payments for previous years' food subsidies, which are included as expenditure in budget estimates for FY2020/21.
- Indonesia:* The IMF staff's projections are based on maintaining a neutral fiscal stance going forward, accompanied by moderate tax policy and administration reforms, some expenditure realization, and a gradual increase in capital spending over the medium term in line with fiscal space.
- Ireland:* Fiscal projections are based on the country's Budget 2023.
- Italy:* The IMF staff's estimates and projections are informed by the fiscal plans included in the government's 2023 budget, 2023 Economic and Financial Document, and their amendments. The stock of maturing postal bonds is included in the debt projections. The data and forecasts reflect information available through September 21, 2023.
- Japan:* The projections reflect fiscal measures the government has already announced, with adjustments for the IMF staff's assumptions.
- Kazakhstan:* Fiscal projections are based on the budget law and the IMF staff's projections.
- Korea:* The forecast incorporates the 2023 budget and authorities' medium-term fiscal plan as well as the IMF staff's adjustments.
- Lebanon:* Data and projections for 2023–28 are omitted owing to an unusually high degree of uncertainty.
- Libya:* The IMF staff's judgments are based on 2022 fiscal accounts.
- Malaysia:* Fiscal projections are based on budget numbers, discussion with the authorities, and IMF staff estimates.
- Mali:* Fiscal projections are based on approved budget and IMF staff estimates for past and current year, authorities' medium-term fiscal framework, and IMF staff estimates for outer years.
- Malta:* Projections are based on the authorities' latest budget document, adjusted for the IMF staff's macroeconomic and other assumptions.
- Mexico:* The 2020 public sector borrowing requirements estimated by the IMF staff adjust for some statistical discrepancies between above-the-line and below-the-line numbers. Fiscal projections for 2023 and 2024 are informed by the estimates in *Criteria 2024*; projections for 2025 onward assume continued compliance with rules established in the Federal Budget and Fiscal Responsibility Law.
- Moldova:* Fiscal projections are based on various bases and growth rates for GDP, consumption, imports, wages, and energy prices and on demographic changes.
- Myanmar:* Fiscal projections are made based on budget numbers and changed macro environment.
- The Netherlands:* Fiscal projections for 2023–28 are based on the IMF staff's forecast framework and are also informed by the authorities' draft budget plan and Bureau for Economic Policy Analysis projections.
- New Zealand:* Fiscal projections are based on the FY2023/24 budget (May 2023) and the IMF staff's estimates.
- Nicaragua:* Fiscal projections use the latest forecast from Nicaragua's Finance Ministry and the IMF staff's assumptions.
- Niger:* Fiscal data contain outturns as of the end of 2022. Fiscal sector projections are based on the 2023 budget, discussions with the authorities, as well as the recent political events.

Nigeria: Fiscal projections are based on macro framework reflecting the authorities' recent reforms, as well as the 2023 budget.

Norway: The fiscal projections are based on the 2023 budget and subsequent ad hoc updates.

Philippines: Revenue projections reflect the IMF staff's macroeconomic assumptions and incorporate the updated data. Expenditure projections are based on budgeted figures, institutional arrangements, and current data in each year.

Poland: Data are based on ESA-95 2004 and prior. Data are based on ESA 2010 beginning in 2005 (accrual basis). Projections begin in 2023, based on the 2023 budgets and subsequently announced fiscal measures.

Portugal: The projections for the current year are based on the authorities' approved budget, adjusted to reflect the IMF staff's macroeconomic forecast. Projections thereafter are based on the assumption of unchanged policies. Projections for 2023 reflect information available in the 2023 budget proposal.

Romania: Fiscal projections reflect legislated changes up to the end of 2022 and measures announced in 2023. Medium-term projections include assumptions about gradual implementation of measures and disbursement in the framework of the European Union's Recovery and Resilience Facility.

Russian Federation: The fiscal rule was suspended last year by the government in response to the sanctions imposed after the invasion of Ukraine, allowing for windfall oil and gas revenues above benchmark to be used to finance a larger deficit in 2022. Savings accumulated in the National Welfare Fund can also now be used in this way. A new fiscal rule will become fully effective in 2025. The new rule allows for higher oil and gas revenues to be spent, but it simultaneously targets a smaller primary structural deficit.

Saudi Arabia: The IMF staff's baseline fiscal projections are primarily based on its understanding of government policies as outlined in the 2023 budget statement. Export oil revenues are based on *World Economic Outlook* 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: FY2021 figures are based on budget execution. FY2022 projections are based on

revised figures based on budget execution through the end of 2022. FY2023 projections are based on the initial budget of February 14, 2023. The IMF staff's revenue projections include (1) an increase in the Goods and Services Tax from 7 percent to 8 percent on January 1, 2023, and to 9 percent on January 1, 2024; and (2) an increase of the carbon tax from S\$5 per ton to S\$25 per ton in 2024 and 2025 and S\$45 per ton in 2026 and 2027.

Slovak Republic: The fiscal projection is based on the 2023 Stability Program and takes into consideration available data for 2022.

Spain: Fiscal projections from 2023 onward assume energy support measures amounting to 1 percent of GDP in 2023. Projections reflect disbursements under the European Union's Recovery and Resilience Facility.

Sri Lanka: Fiscal projections are based on the IMF staff's judgment.

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

Sweden: Fiscal estimates are based on the authorities' budget projections and adjusted to reflect the IMF's staff's macroeconomic forecasts.

Switzerland: The projections assume that fiscal policy is adjusted as necessary to keep fiscal balances in line with the requirements of Switzerland's fiscal rules.

Türkiye: The basis for the projections is the IMF-defined fiscal balance, which excludes some revenue and expenditure items that are included in the authorities' headline balance.

United Kingdom: Fiscal projections are based on the March 2023 forecast from the Office for Budget Responsibility (OBR) and the September 2023 release on public sector finances from the Office of National Statistics. IMF projections take the OBR forecast as a reference and overlay adjustments (for differences in assumptions) to both revenues and expenditures. IMF forecasts do not necessarily assume that the new fiscal rules announced on November 17, 2022, will be met at the end of the forecast period. Data are presented on a calendar year basis. Projections do not incorporate the significant upward statistical revisions to 2020 and 2021 GDP that were previewed on September 1, 2023 (with a release date of September 29, 2023).

United States: Fiscal projections are based on the May 2023 Congressional Budget Office baseline and the latest treasury monthly statement, adjusted for the IMF staff's policy and macroeconomic assumptions. Projections incorporate the effects of the Fiscal Responsibility Act. 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.

Uruguay: Historical fiscal and monetary data are from the Uruguayan authorities. Projections are based on the authorities' policies and projections, adjusted to reflect IMF staff's macroeconomic assumptions and assessment of policy plans.

Venezuela: Projections for 2023–28 are omitted due to an unusual high degree of uncertainty.

Vietnam: Projections starting 2022 use authorities' 2022 budget numbers and the IMF staff's own projections.

Yemen: Hydrocarbon revenue projection are based on *World Economic Outlook* assumptions for hydrocarbon prices and authorities' projections for oil and gas production. Non-hydrocarbon revenues largely reflect authorities' projection and the evolution of other key indicators. Over the medium term, we assume conflict resolution, a recovery in economic activity, and additional expenditures associated with reconstruction costs.

Zambia: Government net and gross debt projections for 2023–28 are omitted due to debt restructuring.

Definition and Coverage of Fiscal Data

Table A. Economy Groupings

The following groupings of economies are used in the *Fiscal Monitor*. Data for all the economies can be found at <https://www.imf.org/external/datamapper/datasets/FM>.

Advanced Economies	Emerging Market and Middle-Income Economies	Low-Income Developing Countries	G7 Countries	G20 Countries ¹	Advanced G20 Countries ¹	Emerging G20 Countries
Andorra	Albania	Afghanistan	Canada	Argentina	Australia	Argentina
Australia	Algeria	Bangladesh	France	Australia	Canada	Brazil
Austria	Angola	Benin	Germany	Brazil	France	China
Belgium	Antigua and Barbuda	Bhutan	Italy	Canada	Germany	India
Canada	Armenia	Burkina Faso	Japan	China	Italy	Indonesia
Croatia	Aruba	Burundi	United Kingdom	France	Japan	Mexico
Cyprus	Azerbaijan	Cambodia	United States	Germany	Korea	Russian Federation
Czech Republic	Bahamas, The	Cameroon		India	United Kingdom	Saudi Arabia
Denmark	Barbados	Central African Republic		Indonesia	United States	South Africa
Estonia	Bahrain	Chad		Italy		Türkiye
Finland	Belarus	Chad		Japan		
France	Belize	Comoros		Korea		
Germany	Bolivia	Congo, Democratic Republic of the		Mexico		
Greece	Bosnia and Herzegovina	Congo, Republic of		Russian Federation		
Hong Kong SAR	Brazil	Côte d'Ivoire		Saudi Arabia		
Iceland	Brunei Darussalam	Djibouti		South Africa		
Ireland	Bulgaria	Eritrea		Türkiye		
Israel	Cabo Verde	Ethiopia		United Kingdom		
Italy	Chile	Gambia, The		United States		
Japan	China	Ghana				
Korea	Colombia	Guinea				
Latvia	Costa Rica	Guinea-Bissau				
Lithuania	Dominica	Haiti				
Luxembourg	Dominican Republic	Honduras				
Macao SAR	Ecuador	Kenya				
Malta	Egypt	Kiribati				
Netherlands, The	El Salvador	Kyrgyz Republic				
New Zealand	Equatorial Guinea	Lao P.D.R.				
Norway	Eswatini	Lesotho				
Portugal	Fiji	Liberia				
Puerto Rico	Gabon	Madagascar				
San Marino	Georgia	Malawi				
Singapore	Grenada	Mali				
Slovak Republic	Guatemala	Mauritania				
Slovenia	Guyana	Moldova				
Spain	Hungary	Mozambique				
Sweden	India	Myanmar				
Switzerland	Indonesia	Nepal				
Taiwan Province of China	Iran	Nicaragua				
United Kingdom	Iraq	Niger				
United States	Jamaica	Nigeria				
	Jordan	Papua New Guinea				
	Kazakhstan	Rwanda				
	Kosovo	São Tomé and Príncipe				
	Kuwait	Senegal				
	Lebanon	Sierra Leone				
	Libya	Solomon Islands				
	Malaysia	South Sudan				
		Somalia				
		Sudan				
		Tajikistan				

Table A. Economy Groupings (continued)

Advanced Economies	Emerging Market and Middle-Income Economies	Low-Income Developing Countries	G7 Countries	G20 Countries ¹	Advanced G20 Countries ¹	Emerging G20 Countries
	Maldives	Tanzania				
	Marshall Islands	Timor-Leste				
	Mauritius	Togo				
	Mexico	Uganda				
	Micronesia	Uzbekistan				
	Mongolia	Vietnam				
	Montenegro	Yemen				
	Morocco	Zambia				
	Namibia	Zimbabwe				
	Nauru					
	North Macedonia					
	Oman					
	Pakistan					
	Palau					
	Panama					
	Paraguay					
	Peru					
	Philippines					
	Poland					
	Qatar					
	Romania					
	Russian Federation					
	Samoa					
	Saudi Arabia					
	Serbia					
	Seychelles					
	South Africa					
	Sri Lanka					
	St. Kitts and Nevis					
	St. Lucia					
	St. Vincent and the Grenadines					
	Suriname					
	Thailand					
	Tonga					
	Trinidad and Tobago					
	Tunisia					
	Türkiye					
	Turkmenistan					
	Tuvalu					
	Ukraine					
	United Arab Emirates					
	Uruguay					
	Vanuatu					
	Venezuela					
	West Bank and Gaza					

Note: G7 = Group of Seven; G20 = Group of Twenty.

¹ Does not include European Union aggregate.

Table A. Economy Groupings (continued)

Euro Area	Emerging Market and Middle-Income Asia	Emerging Market and Middle-Income Europe	Emerging Market and Middle-Income Latin America	Emerging Market and Middle-Income Middle East, North Africa, and Pakistan	Emerging Market and Middle-Income Africa
Austria	Brunei Darussalam	Albania	Antigua and Barbuda	Algeria	Angola
Belgium	China	Azerbaijan	Argentina	Bahrain	South Africa
Croatia	Fiji	Belarus	Aruba	Egypt	
Cyprus	India	Bosnia and Herzegovina	Bahamas, The	Iran	
Estonia	Indonesia	Bulgaria	Barbados	Iraq	
Finland	Malaysia	Hungary	Belize	Jordan	
France	Maldives	Kazakhstan	Bolivia	Kuwait	
Germany	Marshall Islands	Kosovo	Brazil	Lebanon	
Greece	Micronesia	Montenegro	Chile	Libya	
Ireland	Mongolia	North Macedonia	Colombia	Morocco	
Italy	Nauru	Poland	Costa Rica	Oman	
Latvia	Palau	Romania	Dominica	Pakistan	
Lithuania	Philippines	Russian Federation	Dominican Republic	Qatar	
Luxembourg	Samoa	Serbia	Ecuador	Saudi Arabia	
Malta	Sri Lanka	Türkiye	El Salvador	Tunisia	
Netherlands	Thailand	Ukraine	Grenada	United Arab Emirates	
Portugal	Tonga		Guatemala		
Slovak Republic	Tuvalu		Guyana		
Slovenia	Vanuatu		Jamaica		
Spain			Mexico		
			Panama		
			Paraguay		
			Peru		
			St. Kitts and Nevis		
			St. Lucia		
			St. Vincent and the Grenadines		
			Suriname		
			Trinidad and Tobago		
			Uruguay		
			Venezuela		

Table A. Economy Groupings (continued)

Low-Income Developing Asia	Low-Income Developing Latin America	Low-Income Developing Sub-Saharan Africa	Low-Income Developing Others	Low-Income Oil Producers	Oil Producers
Bangladesh	Haiti	Benin	Afghanistan	Chad	Algeria
Bhutan	Honduras	Burkina Faso	Djibouti	Congo, Republic of	Angola
Cambodia	Nicaragua	Burundi	Kyrgyz Republic	Nigeria	Azerbaijan
Kiribati		Cameroon	Mauritania	Timor-Leste	Bahrain
Lao P.D.R.		Central African Republic	Moldova	Yemen	Brunei Darussalam
Myanmar		Chad	Somalia		Chad
Nepal		Chad	Sudan		Canada
Papua New Guinea		Comoros	Tajikistan		Congo, Republic of
Solomon Islands		Congo, Democratic Republic of the	Uzbekistan		Ecuador
Timor-Leste		Congo, Republic of	Yemen		Equatorial Guinea
Vietnam		Côte d'Ivoire			Gabon
		Eritrea			Iran
		Ethiopia			Iraq
		Gambia, The			Kazakhstan
		Ghana			Kuwait
		Guinea			Libya
		Guinea-Bissau			Nigeria
		Kenya			Norway
		Lesotho			Oman
		Liberia			Qatar
		Madagascar			Russian Federation
		Malawi			Saudi Arabia
		Mali			Timor-Leste
		Mozambique			Trinidad and Tobago
		Niger			Turkmenistan
		Nigeria			United Arab Emirates
		Rwanda			Venezuela
		São Tomé and Príncipe			Yemen
		Senegal			
		Sierra Leone			
		South Sudan			
		Tanzania			
		Togo			
		Uganda			
		Zambia			
		Zimbabwe			

Table B. Advanced Economies: Definition and Coverage of Fiscal Monitor Data

	Overall Fiscal Balance ¹			Cyclically Adjusted Balance			Gross Debt		
	Coverage		Accounting Practice	Coverage		Accounting Practice	Coverage		Valuation of Debt ²
	Aggregate	Subsectors		Aggregate	Subsectors		Aggregate	Subsectors	
Andorra	GG	CG,LG,SS	A	...	...	...	GG	CG	Nominal
Australia	GG	CG,SG,LG,TG	A	GG	CG,SG,LG,TG	A	GG	CG,SG,LG,TG	Current market
Austria	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	Face
Belgium	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	Face
Canada	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	Face
Croatia	GG	CG,LG	A	GG	CG,LG	A	GG	CG,LG	Nominal
Cyprus	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Czech Republic	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Denmark	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Estonia	GG	CG,LG,SS	C	...	...	...	GG	CG,LG,SS	Nominal
Finland	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
France	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Germany	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	Face
Greece	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Hong Kong SAR	GG	CG	C	GG	CG	C	GG	CG	Face
Iceland	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Ireland	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Israel	GG	CG,LG,SS	Mixed	GG	CG,LG,SS	Mixed	GG	CG,LG,SS	Nominal
Italy	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Japan	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Current market
Korea	CG	CG,SS	C	CG	CG,SS	C	GG	CG,SS	Nominal
Latvia	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
Lithuania	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Luxembourg	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Malta	GG	CG,SS	A	GG	CG,SS	A	GG	CG,SS	Nominal
The Netherlands	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
New Zealand	GG	CG,LG	A	GG	CG,LG	A	GG	CG,LG	Current market
Norway	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Current market
Portugal	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Singapore	GG	CG	C	GG	CG	C	GG	CG	Nominal
Slovak Republic	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Slovenia	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Spain	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	Nominal
Sweden	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Switzerland	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	A	GG	CG,SG,LG,SS	Nominal
United Kingdom	GG	CG,LG	A	GG	CG,LG	A	GG	CG,LG	Nominal
United States	GG	CG,SG,LG	A	GG	CG,SG,LG	A	GG	CG,SG,LG	Nominal

Note: Coverage: CG = central government; GG = general government; LG = local governments; SG = state governments; SS = social security funds; TG = territorial governments. Accounting practice: A = accrual; C = cash; Mixed = combination of accrual and cash accounting.

¹In many economies, fiscal data follow the IMF's *Government Finance Statistics Manual 2014*. The concept of overall fiscal balance refers to net lending and borrowing of the general government. In some cases, however, the overall balance refers to total revenue and grants minus total expenditure and net lending.

²"Nominal" refers to debt securities that are valued at their nominal values; that is, the nominal value of a debt instrument at any moment in time is the amount that the debtor owes to the creditor. "Face" refers to the undiscounted amount of principal to be repaid at (or before) maturity. The use of face value as a proxy for nominal value in measuring the gross debt position can result in an inconsistent approach across all instruments and is not recommended unless nominal and market values are not available. "Current market" refers to debt securities that are valued at market prices; insurance, pension, and standardized guarantee schemes are valued according to principles that are equivalent to market valuation; and all other debt instruments are valued at nominal prices, which are considered to be the best generally available proxies for their market prices.

Table C. Emerging Market and Middle-Income Economies: Definition and Coverage of Fiscal Monitor Data

	Overall Fiscal Balance ¹			Cyclically Adjusted Balance			Gross Debt		
	Coverage		Accounting Practice	Coverage		Accounting Practice	Coverage		Valuation of Debt ²
	Aggregate	Subsectors		Aggregate	Subsectors		Aggregate	Subsectors	
Algeria	CG	CG	C	...	...	...	CG	CG	Face
Angola ³	GG	CG,LG	Mixed	...	...	...	GG	CG,LG	Nominal
Argentina	GG	CG,SG,SS	C	CG	CG	C	CG	CG	Nominal
Belarus ⁴	GG	CG,LG,SS	C	...	...	...	GG	CG,LG,SS	Nominal
Brazil	GG	CG,SG,LG,SS	C	GG	CG,SG,LG,SS	C	GG	CG,SG,LG,SS	Nominal
Bulgaria	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
Chile	GG	CG,LG	A	CG	CG	A	GG	CG,LG	Face
China	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Face
Colombia ⁵	GG	CG,SG,LG,SS	Mixed	GG	CG,SG,LG,SS	Mixed	GG	CG,SG,LG,SS	Face
Dominican Republic	CG	CG,LG,SS,NMPC	Mixed	PS	CG,LG,SS,NMPC	Mixed	PS	CG,LG,SS,NMPC	Face
Ecuador	NFPS	CG,SG,LG,SS,NFPFC	Mixed	NFPS	CG,SG,LG,SS,NFPFC	Mixed	NFPS	CG,SG,LG,SS,NFPFC	Nominal
Egypt	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
Hungary	GG	CG,LG,SS,NMPC	A	GG	CG,LG,SS,NMPC	A	GG	CG,LG,SS,NMPC	Face
India	GG	CG,SG	C	GG	CG,SG	C	GG	CG,SG	Nominal
Indonesia	GG	CG,LG	C	GG	CG,LG	C	GG	CG,LG	Face
Iran	CG	CG	C	...	...	...	CG	CG	Nominal
Kazakhstan	GG	CG,LG	C	...	...	...	GG	CG,LG	Nominal
Kuwait	GG	CG,SS	Mixed	...	...	...	GG	CG,SS	Nominal
Lebanon	CG	CG	Mixed	CG	CG	Mixed	CG	CG	Nominal
Malaysia	GG	CG,SG,LG	C	GG	CG,SG,LG	C	GG	CG,SG,LG	Nominal
Mexico	PS	CG,SS,NMPC,NFPFC	C	PS	CG,SS,NMPC,NFPFC	C	PS	CG,SS,NMPC,NFPFC	Face
Morocco	CG	CG	A	...	...	...	CG	CG	Face
Oman	CG	CG	C	...	...	...	CG	CG	Nominal
Pakistan	GG	CG,SG,LG	C	...	...	...	GG	CG,SG,LG	Nominal
Peru	GG	CG,SG,LG,SS	C	GG	CG,SG,LG,SS	C	NFPS	CG,SG,LG,SS,NFPFC	Face
Philippines	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
Poland	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Face
Qatar	CG	CG	C	...	...	...	CG	CG	Nominal
Romania	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Face
Russian Federation	GG	CG,SG,SS	Mixed	GG	CG,SG,SS	Mixed	GG	CG,SG,SS	Current market
Saudi Arabia	CG	CG	C	...	...	...	CG	CG	Nominal
South Africa ⁶	GG	CG,SG,SS	C	GG	CG,SG,SS	C	GG	CG,SG,SS	Nominal
Sri Lanka	CG	CG	C	...	...	...	CG	CG	Nominal
Thailand ⁷	PS	CG,BCG,LG,SS	A	PS	CG,BCG,LG,SS	A	PS	CG,BCG,LG,SS	Nominal
Türkiye	GG	CG,LG,SS	A	GG	CG,LG,SS	A	GG	CG,LG,SS	Nominal
Ukraine	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
United Arab Emirates	GG	CG,BCG,SG,SS	Mixed	...	...	...	GG	CG,BCG,SG,SS	Nominal
Uruguay	NFPS	CG,LG,SS,NMPC,NFPFC	A	...	...	...	NFPS	CG,LG,SS,NMPC,NFPFC	Face
Venezuela ⁸	GG	BCG,NFPFC	C	GG	BCG,NFPFC	C	GG	BCG,NFPFC	Nominal

Note: Coverage: BCG = budgetary central government; CG = central government; GG = general government; LG = local governments; NFPFC = nonfinancial public corporations; NFPS = nonfinancial public sector; NMPC = nonmonetary financial public corporations; PS = public sector; SG = state governments; SS = social security funds. Accounting practice: A = accrual; C = cash; Mixed = combination of accrual and cash accounting.

¹In many economies, fiscal data follow the IMF's *Government Finance Statistics Manual 2014*. The concept of overall fiscal balance refers to net lending and borrowing of the general government. In some cases, however, the overall balance refers to total revenue and grants minus total expenditure and net lending.

²"Nominal" refers to debt securities that are valued at their nominal values; that is, the nominal value of a debt instrument at any moment in time is the amount that the debtor owes to the creditor. "Face" refers to the undiscounted amount of principal to be repaid at (or before) maturity. The use of face value as a proxy for nominal value in measuring the gross debt position can result in an inconsistent approach across all instruments and is not recommended unless nominal and market values are not available. "Current market" refers to debt securities that are valued at market prices; insurance, pension, and standardized guarantee schemes are valued according to principles that are equivalent to market valuation; and all other debt instruments are valued at nominal prices, which are considered to be the best generally available proxies of their market prices.

³Gross debt includes the domestic and external debt of the central government; the external debt of the state-owned oil company, Sonangol, and the state-owned airline, TAAQ; public guarantees; and reported external liabilities of other state entities, including external arrears.

⁴Gross debt refers to general government public debt, including publicly guaranteed debt.

⁵Revenue is recorded on a cash basis and expenditure on an accrual basis.

⁶Coverage for South Africa is consolidated government, which serves as a good proxy for the general government. It includes the national and provincial governments and certain public entities, while local governments are only partly covered. The subnational government debt is estimated to be limited given the available data from the South African Reserve Bank.

⁷Data for Thailand do not include the debt of specialized financial institutions (SFIs/NMPC) without a government guarantee.

⁸The fiscal accounts include the budgetary central government, social security, FOGADE (an insurance deposit institution), and a sample of public enterprises, including Petróleos de Venezuela, S.A. (PDVSA). Data for 2018–22 are IMF staff estimates.

Table D. Low-Income Developing Countries: Definition and Coverage of Fiscal Monitor Data

	Overall Fiscal Balance ¹			Cyclically Adjusted Balance			Gross Debt		
	Coverage		Accounting Practice	Coverage		Accounting Practice	Coverage		Valuation of Debt ²
	Aggregate	Subsectors		Aggregate	Subsectors		Aggregate	Subsectors	
Afghanistan	CG	CG	C	...	...	...	CG	CG	Nominal
Bangladesh	CG	CG	C	CG	CG	C	CG	CG	Nominal
Benin	CG	CG	C	...	...	...	CG	CG	Nominal
Burkina Faso	CG	CG	CB	...	...	...	CG	CG	Face
Cambodia	CG	CG,LG	A	CG	CG,LG	A	CG	CG,LG	Face
Cameroon	CG	CG	C	...	...	...	CG	CG	Nominal
Chad	NFPS	CG,NFPC	C	...	...	...	CG	CG	Face
Congo, Democratic Republic of the	CG	CG,LG	C	...	...	...	GG	CG,LG,NFPC	Nominal
Congo, Republic of	CG	CG	A	...	...	...	CG	CG	Nominal
Côte d'Ivoire	CG	CG,SS	Mixed	...	...	...	CG	CG,NFPC	Nominal
Ethiopia	GG	CG,SG,LG	C	...	...	...	NFPS	CG,SG,LG,NFPC	Nominal
Ghana	CG	CG	CB	...	...	...	CG	CG	Face
Guinea	CG	CG	Mixed	...	...	...	CG	CG	Nominal
Haiti ³	CG	CG	C	...	...	...	CG	CG	Nominal
Honduras	GG	CG,LG,SS	Mixed	GG	CG,LG,SS	Mixed	GG	CG,LG,SS	Nominal
Kenya	CG	CG	C	...	...	...	CG	CG	Current market
Kyrgyz Republic	GG	CG,LG,SS	C	...	...	...	GG	CG,LG,SS	Face
Lao P.D.R. ⁴	CG	CG	C	CG	CG	C	CG	CG	Nominal
Madagascar	CG	CG,LG	CB	...	...	...	NFPS	CG,LG,NFPC	Nominal
Malawi	CG	CG	C	...	...	...	CG	CG	...
Mali	CG	CG	Mixed	...	...	...	CG	CG	Nominal
Moldova	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
Mozambique	CG	CG,SG	Mixed	CG	CG,SG	Mixed	CG	CG,SG	Nominal
Myanmar ⁵	NFPS	CG,NFPC	C	...	...	...	NFPS	CG,NFPC	Face
Nepal	CG	CG	C	CG	CG	C	CG	CG	Face
Nicaragua	GG	CG,LG,SS	C	GG	CG,LG,SS	C	GG	CG,LG,SS	Nominal
Niger	CG	CG	A	...	...	...	CG	CG	Nominal
Nigeria	GG	CG,SG,LG	C	...	...	...	GG	CG,SG,LG	Current market
Papua New Guinea	CG	CG	C	...	...	...	CG	CG	Face
Rwanda	GG	CG,LG	Mixed	...	...	...	CG	CG	Nominal
Senegal	CG	CG	C	...	...	...	PS	CG,LG,SS,NFPC	Nominal
Sudan	CG	CG	Mixed	...	...	...	CG	CG	Nominal
Tajikistan	GG	CG,LG,SS	C	...	...	...	GG	CG,LG,SS	Nominal
Tanzania	CG	CG,LG	C	...	...	...	CG	CG,LG	Nominal
Uganda	CG	CG	C	...	...	...	CG	CG	Nominal
Uzbekistan ⁶	GG	CG,SG,LG,SS	C	...	...	...	GG	CG,SG,LG,SS	Nominal
Vietnam	GG	CG,SG,LG	C	GG	CG,SG,LG	C	GG	CG,SG,LG	Nominal
Yemen	GG	CG,LG	C	...	...	...	GG	CG,LG	Nominal
Zambia	CG	CG	C	...	...	...	CG	CG	Nominal
Zimbabwe	CG	CG	C	...	...	...	CG	CG	Current market

Note: Coverage: CG = central government; LG = local governments; NFPC = nonfinancial public corporations; NFPS = nonfinancial public sector; PS = public sector; SG = state governments; SS = social security funds. Accounting practice: A = accrual; C = cash; CB = commitments based; Mixed = combination of accrual and cash accounting.

¹ In many countries, fiscal data follow the IMF's *Government Finance Statistics Manual 2014*. The concept of overall fiscal balance refers to net lending and borrowing of the general government. In some cases, however, the overall balance refers to total revenue and grants minus total expenditure and net lending.

² "Nominal" refers to debt securities that are valued at their nominal values; that is, the nominal value of a debt instrument at any moment in time is the amount that the debtor owes to the creditor. "Face" refers to the undiscounted amount of principal to be repaid at (or before) maturity. The use of face value as a proxy for nominal value in measuring the gross debt position can result in an inconsistent approach across all instruments and is not recommended unless nominal and market values are not available. "Current market" refers to debt securities that are valued at market prices; insurance, pension, and standardized guarantee schemes are valued according to principles that are equivalent to market valuation; and all other debt instruments are valued at nominal prices, which are considered to be the best generally available proxies of their market prices.

³ Haiti's fiscal balance and debt data cover the central government, special funds and programs (Fonds d'Entretien Routier and Programme de Scolarisation Universelle, Gratuite, et Obligatoire), and the state-owned electricity company EDH.

⁴ Lao P.D.R.'s fiscal spending includes capital spending by local governments financed by loans provided by the central bank.

⁵ Overall and primary balances in 2012 are based on monetary statistics and are different from the balances calculated from expenditure and revenue data.

⁶ Uzbekistan's listing includes the Fund for Reconstruction and Development.

Table A1. Advanced Economies: General Government Overall Balance, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-3.1	-2.6	-2.7	-2.4	-2.4	-3.0	-10.2	-7.5	-3.3	-5.2	-4.4	-4.2	-3.9	-3.8	-4.0
Euro Area	-2.5	-1.9	-1.5	-0.9	-0.4	-0.6	-7.1	-5.3	-3.6	-3.4	-2.7	-2.3	-2.1	-2.1	-2.1
G7	-3.6	-3.0	-3.3	-3.3	-3.3	-3.8	-11.6	-9.1	-4.1	-6.5	-5.6	-5.3	-5.0	-4.8	-5.0
G20 Advanced	-3.4	-2.9	-3.1	-3.0	-3.0	-3.6	-11.2	-8.7	-4.0	-6.1	-5.3	-5.0	-4.7	-4.5	-4.7
Andorra	2.1	1.7	4.1	3.3	2.7	2.3	-1.1	-1.2	4.9	3.3	3.4	3.4	3.5	3.7	3.7
Australia	-2.9	-2.8	-2.4	-1.7	-1.3	-4.4	-8.7	-6.5	-2.3	-1.4	-2.2	-1.9	-1.5	-1.5	-1.2
Austria	-2.7	-1.0	-1.5	-0.8	0.2	0.6	-8.0	-5.8	-3.2	-2.4	-2.0	-1.7	-1.6	-1.5	-1.5
Belgium	-3.1	-2.4	-2.4	-0.7	-0.9	-2.0	-9.0	-5.5	-3.9	-4.9	-4.8	-4.8	-5.1	-5.5	-5.5
Canada	0.2	-0.1	-0.5	-0.1	0.4	0.0	-10.9	-4.4	-0.8	-0.7	-0.6	-0.5	-0.4	-0.3	-0.2
Croatia	-5.2	-3.5	-1.0	0.8	0.1	2.2	-7.3	-2.5	0.4	-0.8	-1.7	-1.1	-0.8	-0.8	-0.6
Cyprus ¹	-0.2	0.1	0.3	1.9	-3.6	1.3	-5.8	-2.0	2.1	1.9	1.7	1.5	1.3	1.0	0.9
Czech Republic	-2.1	-0.6	0.7	1.5	0.9	0.3	-5.8	-5.1	-3.6	-4.1	-2.3	-2.0	-1.9	-1.6	-1.4
Denmark	1.1	-1.3	-0.1	1.8	0.8	4.1	0.4	4.1	3.4	1.8	0.9	0.5	0.3	0.1	0.0
Estonia	0.3	-0.4	-1.0	-1.0	-1.1	0.1	-5.5	-2.4	-0.9	-3.9	-3.2	-2.8	-2.7	-2.6	-2.5
Finland	-3.0	-2.4	-1.7	-0.7	-0.9	-0.9	-5.6	-2.8	-0.9	-2.6	-2.5	-2.8	-2.0	-1.3	-1.1
France	-3.9	-3.6	-3.6	-3.0	-2.3	-3.1	-9.0	-6.5	-4.8	-4.9	-4.5	-4.0	-3.6	-3.5	-3.6
Germany	0.6	1.0	1.2	1.3	1.9	1.5	-4.3	-3.6	-2.5	-2.9	-1.7	-0.9	-0.6	-0.5	-0.5
Greece	-4.2	-3.0	0.3	0.9	0.8	0.0	-10.5	-7.7	-2.3	-1.6	-0.8	-0.9	-0.9	-1.1	-1.2
Hong Kong SAR	3.6	0.6	4.4	5.5	2.3	-0.6	-9.2	0.0	-6.6	-3.9	-1.0	0.2	0.6	1.3	1.3
Iceland	0.3	-0.4	12.5	1.0	1.0	-1.6	-8.9	-8.5	-4.1	-0.9	-1.2	-1.3	-0.3	-0.4	-0.9
Ireland ¹	-3.6	-2.0	-0.8	-0.3	0.1	0.5	-5.0	-1.6	1.6	1.7	1.8	1.8	1.6	1.1	0.9
Israel	-2.3	-1.2	-1.7	-1.2	-3.6	-3.9	-10.8	-3.7	0.6	-1.6	-2.0	-2.8	-3.2	-3.5	-3.7
Italy	-3.0	-2.6	-2.4	-2.4	-2.2	-1.5	-9.7	-9.0	-8.0	-5.0	-4.0	-3.3	-2.7	-2.7	-2.5
Japan	-5.6	-3.7	-3.6	-3.1	-2.5	-3.0	-9.1	-6.2	-6.9	-5.6	-3.7	-2.6	-2.7	-2.9	-3.3
Korea	0.6	0.5	1.6	2.2	2.6	0.4	-2.2	0.0	-1.6	-1.2	-0.9	-0.3	-0.2	0.0	0.0
Latvia	-1.7	-1.5	-0.4	-0.8	-0.7	-0.4	-3.7	-5.4	-3.7	-3.7	-1.8	-2.0	-2.0	-1.1	-0.9
Lithuania	-0.7	-0.2	0.3	0.5	0.6	0.3	-7.2	-1.0	-0.6	-1.8	-1.4	-1.1	-1.1	-1.0	-1.0
Luxembourg	1.3	1.3	1.9	1.4	3.0	2.2	-3.4	0.7	0.2	-2.8	-1.9	-1.3	-0.8	-0.7	-0.7
Malta	-1.7	-1.0	1.1	3.3	2.0	0.5	-9.5	-7.7	-5.7	-5.2	-3.9	-3.5	-2.9	-2.2	-1.6
The Netherlands	-2.3	-1.9	0.1	1.4	1.5	1.8	-3.7	-2.3	-0.1	-2.1	-1.9	-2.0	-2.2	-2.4	-2.5
New Zealand	-0.3	0.4	1.0	1.4	1.3	-2.5	-4.4	-3.5	-3.5	-3.4	-3.5	-2.2	-1.3	-0.4	0.0
Norway	8.6	6.0	4.0	5.0	7.8	6.5	-2.6	10.0	25.3	15.1	14.4	13.1	12.0	10.9	9.8
Portugal	-7.3	-4.3	-1.9	-3.0	-0.3	0.1	-5.8	-2.9	-0.4	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2
Singapore	4.6	2.9	3.3	5.2	3.7	3.8	-6.8	1.2	0.8	3.2	2.8	3.4	2.9	2.8	2.7
Slovak Republic	-3.1	-2.7	-2.6	-1.0	-1.0	-1.2	-5.4	-5.4	-2.0	-5.5	-4.4	-4.4	-4.5	-4.0	-3.9
Slovenia	-5.5	-2.8	-1.9	-0.1	0.7	0.7	-7.6	-4.6	-3.1	-3.5	-2.7	-2.3	-1.9	-1.7	-1.7
Spain ¹	-6.1	-5.3	-4.3	-3.1	-2.6	-3.1	-10.1	-6.8	-4.7	-3.9	-3.0	-3.4	-3.4	-3.4	-3.4
Sweden	-1.5	0.0	1.0	1.4	0.8	0.6	-2.8	-0.1	0.7	-0.4	-0.6	0.2	0.4	0.4	0.4
Switzerland	-0.2	0.5	0.2	1.1	1.3	1.3	-3.0	-0.3	0.9	0.1	0.4	0.3	0.2	0.2	0.2
United Kingdom	-5.5	-4.5	-3.3	-2.4	-2.2	-2.2	-13.0	-8.3	-5.5	-4.5	-3.9	-3.7	-3.7	-3.5	-3.5
United States ²	-4.0	-3.5	-4.4	-4.8	-5.3	-5.7	-14.0	-11.6	-3.7	-8.2	-7.4	-7.4	-7.0	-6.7	-7.0

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: For country-specific details, see "Data and Conventions" in text and Table B.

¹Data include financial sector support. For Cyprus, 2014 and 2015 balances exclude financial sector support.

²For cross-economy comparison, the expenditures and fiscal balances of the United States are adjusted to exclude the imputed interest on unfunded pension liabilities and the imputed compensation of employees, which are counted as expenditures under the 2008 System of National Accounts (2008 SNA) adopted by the United States, but not in economies that have not yet adopted the 2008 SNA. Data for the United States in this table may therefore differ from data published by the US Bureau of Economic Analysis.

Table A2. Advanced Economies: General Government Primary Balance, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-1.5	-1.1	-1.1	-1.0	-0.9	-1.6	-9.0	-6.1	-1.6	-3.5	-2.6	-2.2	-1.8	-1.6	-1.6
Euro Area	-0.2	0.1	0.4	0.8	1.2	0.8	-5.7	-4.0	-2.1	-1.9	-1.0	-0.5	-0.2	-0.1	0.0
G7	-1.8	-1.3	-1.6	-1.6	-1.6	-2.1	-10.1	-7.4	-2.1	-4.4	-3.3	-2.9	-2.4	-2.1	-2.1
G20 Advanced	-1.7	-1.3	-1.5	-1.4	-1.4	-2.0	-9.7	-7.0	-2.1	-4.1	-3.1	-2.7	-2.2	-1.9	-2.0
Andorra	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Australia	-2.1	-1.9	-1.5	-0.8	-0.4	-3.6	-7.8	-5.7	-1.4	-0.2	-0.7	-0.3	0.1	0.2	0.5
Austria	-0.7	0.9	0.1	0.6	1.4	1.6	-7.0	-5.1	-2.6	-1.7	-0.8	-0.5	-0.2	-0.1	-0.1
Belgium	-0.2	0.2	0.0	1.4	1.0	-0.3	-7.3	-4.0	-2.6	-3.3	-3.0	-2.8	-3.0	-3.1	-3.0
Canada	0.5	0.6	0.1	0.1	0.5	0.1	-10.5	-5.0	-1.3	-1.0	-0.7	-0.5	-0.3	-0.2	0.0
Croatia	-2.3	-0.4	1.8	3.2	2.2	4.2	-5.5	-1.1	1.6	0.9	0.0	0.4	0.5	0.4	0.5
Cyprus ¹	2.8	3.0	2.7	4.2	-1.4	3.3	-3.7	-0.3	3.5	3.2	3.0	2.7	2.5	2.2	2.2
Czech Republic	-1.0	0.3	1.5	2.1	1.5	0.8	-5.2	-4.5	-3.1	-3.2	-1.2	-1.0	-0.8	-0.6	-0.4
Denmark	1.6	-0.6	0.4	1.7	0.4	3.9	0.1	3.7	3.2	1.4	0.4	0.0	-0.2	-0.3	-0.5
Estonia	0.2	-0.4	-1.0	-1.1	-1.2	0.1	-5.5	-2.5	-0.9	-3.6	-2.9	-2.4	-2.2	-2.2	-2.1
Finland	-2.8	-2.3	-1.4	-0.4	-0.7	-0.8	-5.5	-2.8	-0.9	-2.6	-2.1	-2.1	-1.6	-1.1	-1.0
France	-1.8	-1.8	-1.9	-1.3	-0.7	-1.7	-7.8	-5.2	-3.0	-3.3	-2.7	-2.0	-1.5	-1.1	-0.9
Germany	1.8	2.0	2.1	2.2	2.7	2.1	-3.9	-3.1	-1.9	-2.1	-0.8	0.0	0.3	0.4	0.4
Greece	-0.2	0.6	3.5	4.1	4.2	3.0	-7.5	-5.2	0.1	1.0	2.0	2.0	2.2	2.2	2.2
Hong Kong SAR	3.6	0.6	3.6	4.7	1.0	-2.2	-11.1	-2.7	-9.8	-5.9	-2.4	-1.3	-0.6	0.2	0.2
Iceland	3.8	3.2	15.5	3.9	3.1	0.5	-6.8	-6.3	-0.9	1.4	0.6	0.7	1.5	1.6	1.0
Ireland ¹	-0.3	0.3	1.5	1.6	1.7	1.7	-4.0	-0.8	2.2	2.3	2.4	2.3	2.1	1.6	1.3
Israel	-0.2	0.6	0.2	0.7	-1.4	-2.0	-9.0	-1.0	3.8	1.1	0.4	-0.6	-1.0	-1.3	-1.4
Italy	1.4	1.4	1.3	1.2	1.3	1.7	-6.4	-5.6	-3.8	-1.1	0.0	0.8	1.5	1.5	1.7
Japan	-4.5	-2.6	-2.5	-2.2	-1.7	-2.4	-8.4	-5.6	-6.5	-5.5	-3.6	-2.4	-2.5	-2.6	-2.8
Korea	0.2	0.2	1.4	1.8	2.1	-0.1	-2.7	-0.4	-1.9	-1.4	-1.0	-0.3	-0.2	0.1	0.1
Latvia	-0.2	0.3	0.8	0.3	0.2	0.5	-2.8	-4.7	-3.2	-3.1	-1.0	-1.1	-1.0	-0.3	-0.2
Lithuania	1.1	1.5	1.8	1.7	1.6	1.2	-6.5	-0.5	-0.3	-1.3	-0.8	-0.3	-0.2	-0.2	-0.2
Luxembourg	1.1	1.1	1.6	1.1	2.8	2.0	-3.7	0.4	-0.1	-3.1	-2.3	-1.7	-1.3	-1.3	-1.4
Malta	0.9	1.2	3.2	5.1	3.5	1.8	-8.2	-6.6	-4.7	-3.7	-2.3	-1.7	-1.1	-0.4	0.3
The Netherlands	-1.1	-1.0	1.0	2.2	2.2	2.4	-3.2	-2.0	0.3	-1.4	-1.2	-1.2	-1.3	-1.4	-1.4
New Zealand	0.3	1.0	1.6	2.0	1.9	-1.9	-3.7	-2.8	-2.6	-1.9	-1.4	-0.1	0.9	1.9	2.3
Norway	6.3	3.4	1.5	2.6	5.7	4.5	-4.6	8.7	23.9	10.7	9.5	8.4	7.7	7.2	6.2
Portugal	-3.0	-0.1	1.9	0.7	2.9	2.9	-3.1	-0.6	1.4	2.0	2.3	2.2	2.2	2.2	2.2
Singapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Slovak Republic	-1.4	-1.2	-1.2	0.2	0.1	-0.2	-4.3	-4.5	-1.2	-4.6	-3.3	-3.1	-3.0	-2.6	-2.6
Slovenia	-2.7	0.0	0.7	2.1	2.5	2.2	-6.2	-3.5	-2.2	-2.8	-1.9	-1.4	-0.9	-0.7	-0.5
Spain ¹	-3.1	-2.7	-1.9	-0.9	-0.4	-1.0	-8.1	-4.8	-2.6	-1.8	-0.7	-0.9	-0.8	-0.8	-0.8
Sweden	-1.4	0.0	1.0	1.4	0.7	0.5	-2.9	-0.2	0.9	-0.2	-0.4	0.4	0.6	0.6	0.6
Switzerland	0.0	0.8	0.4	1.3	1.4	1.4	-2.9	-0.2	1.1	0.2	0.5	0.4	0.3	0.3	0.3
United Kingdom	-3.7	-3.1	-1.8	-0.6	-0.5	-0.9	-12.0	-6.1	-2.2	-2.0	-1.9	-1.5	-1.4	-1.6	-1.8
United States ²	-2.1	-1.7	-2.4	-2.8	-3.1	-3.5	-11.9	-9.3	-1.3	-5.5	-4.3	-4.2	-3.5	-3.0	-3.1

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: "Primary balance" is defined as the overall balance, excluding net interest payments. For country-specific details, see "Data and Conventions" in text and Table B.

¹Data include financial sector support. For Cyprus, 2014 and 2015 balances exclude financial sector support.

²For cross-economy comparison, the expenditures and fiscal balances of the United States are adjusted to exclude the imputed interest on unfunded pension liabilities and the imputed compensation of employees, which are counted as expenditures under the 2008 System of National Accounts (2008 SNA) adopted by the United States, but not in economies that have not yet adopted the 2008 SNA. Data for the United States in this table may therefore differ from data published by the US Bureau of Economic Analysis.

Table A3. Advanced Economies: General Government Cyclically Adjusted Balance, 2014–28
(Percent of potential GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-2.2	-1.9	-2.2	-2.3	-2.5	-3.2	-7.8	-7.1	-5.0	-5.6	-4.6	-4.4	-4.2	-4.1	-4.3
Euro Area	-0.9	-0.6	-0.5	-0.6	-0.3	-0.7	-4.4	-4.1	-3.7	-3.3	-2.4	-2.2	-2.1	-2.1	-2.1
G7	-2.5	-2.2	-2.7	-3.0	-3.2	-3.9	-8.9	-8.5	-5.8	-6.7	-5.6	-5.3	-5.1	-5.0	-5.2
G20 Advanced	-2.4	-2.1	-2.5	-2.7	-2.9	-3.7	-8.6	-8.1	-5.6	-6.4	-5.3	-5.1	-4.8	-4.7	-4.9
Andorra	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Australia ¹	-2.7	-2.5	-2.2	-1.5	-1.1	-4.0	-7.9	-6.3	-2.5	-1.6	-2.3	-1.9	-1.4	-1.4	-1.2
Austria	-2.2	-0.6	-1.3	-0.9	-0.3	0.2	-7.0	-4.8	-3.6	-2.1	-1.3	-1.2	-1.4	-1.5	-1.5
Belgium	-2.6	-2.3	-2.3	-0.8	-1.2	-2.8	-6.5	-5.3	-4.5	-5.2	-4.8	-4.8	-5.1	-5.5	-5.5
Canada	-0.2	0.0	-0.1	-0.3	0.1	-0.2	-9.2	-3.7	-1.1	-0.7	-0.5	-0.5	-0.5	-0.3	-0.2
Croatia	-5.1	-3.1	-0.8	0.9	0.2	2.1	-5.5	-3.3	-0.5	-1.3	-2.1	-1.3	-0.9	-0.8	-0.6
Cyprus	2.3	2.2	1.3	1.7	2.6	0.6	-3.7	-1.4	1.2	1.3	1.2	1.1	1.0	0.7	0.7
Czech Republic	-0.6	-0.4	0.7	0.8	0.1	-0.8	-5.5	-5.4	-3.8	-3.8	-2.2	-2.0	-1.9	-1.6	-1.4
Denmark	2.5	-0.5	-0.4	0.8	-0.3	3.5	2.9	3.2	2.1	0.8	0.2	0.5	0.3	0.1	0.0
Estonia	0.1	-0.2	-0.7	-1.4	-1.5	-0.6	-4.6	-2.9	-0.6	-2.5	-2.3	-2.2	-2.5	-2.6	-2.6
Finland	-0.6	0.1	-0.4	-0.9	-1.0	-1.3	-3.4	-2.4	-1.2	-1.7	-1.9	-2.3	-1.7	-1.2	-1.1
France	-2.5	-2.1	-2.0	-2.0	-1.8	-3.1	-5.9	-5.2	-4.2	-4.3	-4.1	-3.6	-3.5	-3.5	-3.7
Germany	0.8	1.2	1.1	0.8	1.5	1.3	-2.9	-3.0	-2.8	-2.4	-1.1	-0.6	-0.6	-0.5	-0.5
Greece	3.5	3.9	6.5	6.1	4.8	2.8	-2.6	-4.2	-1.8	-1.8	-1.1	-1.2	-1.2	-1.3	-1.2
Hong Kong SAR	3.6	0.7	4.7	5.5	2.3	0.3	-5.5	1.0	-4.6	-3.1	-0.4	0.5	0.8	1.4	1.3
Iceland	1.1	0.1	11.9	0.1	-1.0	-3.4	-5.6	-6.5	-4.4	-1.5	-1.5	-1.3	-0.3	-0.4	-1.0
Ireland ²	-3.1	-1.4	-1.4	-0.9	-0.2	0.3	-4.3	-1.8	1.1	1.5	1.7	1.7	1.6	1.1	0.9
Israel	-2.5	-0.8	-1.6	-1.3	-3.9	-4.3	-9.5	-3.5	-0.2	-2.2	-2.4	-3.0	-3.4	-3.6	-3.7
Italy	-0.5	-0.3	-0.6	-1.3	-1.3	-0.7	-5.8	-6.5	-7.7	-4.8	-3.7	-3.4	-2.7	-2.8	-2.7
Japan	-6.0	-4.5	-4.5	-3.7	-3.0	-3.3	-8.1	-5.5	-6.8	-5.7	-3.8	-2.6	-2.7	-2.9	-3.3
Korea	0.7	0.7	1.8	2.3	2.6	0.5	-1.5	0.1	-1.7	-1.1	-0.8	-0.2	-0.1	0.0	0.0
Latvia	-1.1	-1.1	-0.3	-1.2	-1.5	-1.2	-2.8	-5.3	-3.6	-2.9	-1.2	-1.5	-1.8	-1.0	-0.9
Lithuania	-0.4	0.1	0.6	0.5	0.5	0.1	-6.1	-2.0	-1.3	-1.7	-1.3	-1.1	-1.1	-1.0	-1.0
Luxembourg	1.3	1.5	1.1	1.1	3.1	2.1	-2.4	-0.2	-0.5	-2.5	-1.5	-1.1	-0.8	-0.7	-0.7
Malta	-1.2	-1.6	2.1	2.6	0.7	-1.8	-5.7	-7.3	-6.5	-5.6	-3.9	-3.5	-2.9	-2.2	-1.6
The Netherlands	-0.6	-0.7	0.9	1.4	0.9	1.1	-1.2	-1.7	-1.2	-2.8	-2.5	-2.6	-2.6	-2.5	-2.5
New Zealand	0.4	0.7	1.0	1.1	0.9	-2.2	-4.3	-4.5	-4.8	-5.4	-5.5	-3.4	-1.6	-0.4	0.3
Norway ²	-5.6	-6.6	-7.6	-7.7	-7.0	-7.5	-12.1	-9.7	-7.0	-7.4	-8.0	-8.1	-8.1	-8.2	-8.2
Portugal	-2.7	-1.1	0.2	-2.3	-0.5	-0.7	-2.7	-1.3	-1.3	-0.9	-0.3	-0.4	-0.3	-0.2	-0.2
Singapore	1.0	-0.7	0.7	1.8	0.7	1.7	-7.9	-1.1	-1.3	0.7	0.3	0.8	0.3	0.3	0.2
Slovak Republic	-2.3	-3.3	-3.1	-1.5	-1.6	-1.7	-3.9	-4.9	-1.7	-5.2	-4.3	-4.4	-4.5	-4.0	-3.9
Slovenia	-4.4	-1.9	-1.8	0.0	0.6	0.3	-6.3	-5.6	-3.9	-3.9	-2.9	-2.3	-1.9	-1.7	-1.7
Spain ²	-1.2	-2.1	-2.5	-2.4	-2.2	-3.1	-4.5	-4.0	-4.5	-3.9	-2.9	-3.4	-3.4	-3.4	-3.4
Sweden ²	-0.9	-0.7	0.7	1.0	0.4	-0.1	-1.5	-0.6	0.1	-0.3	-0.1	0.4	0.5	0.4	0.4
Switzerland ²	-0.2	0.5	0.2	1.1	1.1	1.2	-2.3	-0.2	0.8	0.1	0.4	0.3	0.2	0.2	0.2
United Kingdom ²	-2.9	-2.5	-1.6	-1.3	-1.4	-1.6	-10.7	-7.7	-6.5	-4.8	-3.4	-3.1	-3.4	-3.4	-3.5
United States ^{2,3}	-2.7	-2.5	-3.6	-4.3	-5.1	-6.0	-10.7	-11.3	-6.5	-8.8	-7.6	-7.6	-7.2	-7.0	-7.3

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: For country-specific details, see "Data and Conventions" in text and Table B.

¹Data are based on the fiscal year-based potential GDP.

²Data for these economies include adjustments beyond the output cycle.

³For cross-economy comparison, the expenditures and fiscal balances of the United States are adjusted to exclude the imputed interest on unfunded pension liabilities and the imputed compensation of employees, which are counted as expenditures under the 2008 System of National Accounts (2008 SNA) adopted by the United States, but not in economies that have not yet adopted the 2008 SNA. Data for the United States in this table may therefore differ from data published by the US Bureau of Economic Analysis.

Table A4. Advanced Economies: General Government Cyclically Adjusted Primary Balance, 2014–28
 (Percent of potential GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-0.5	-0.4	-0.7	-0.8	-1.0	-1.8	-6.6	-5.7	-3.3	-3.9	-2.8	-2.4	-2.1	-1.9	-1.9
Euro Area	1.3	1.4	1.4	1.2	1.3	0.7	-3.1	-2.8	-2.1	-1.7	-0.7	-0.4	-0.2	-0.1	-0.1
G7	-0.7	-0.5	-1.0	-1.3	-1.4	-2.1	-7.4	-6.8	-3.8	-4.6	-3.3	-2.9	-2.5	-2.2	-2.3
G20 Advanced	-0.7	-0.5	-0.9	-1.1	-1.2	-2.1	-7.2	-6.5	-3.7	-4.3	-3.1	-2.7	-2.3	-2.1	-2.1
Andorra	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Australia ¹	-1.8	-1.6	-1.3	-0.7	-0.2	-3.2	-7.1	-5.5	-1.6	-0.3	-0.7	-0.3	0.2	0.3	0.5
Austria	-0.3	1.3	0.4	0.5	0.9	1.2	-6.0	-4.1	-3.0	-1.4	-0.2	0.0	0.0	-0.1	-0.1
Belgium	0.2	0.2	0.1	1.3	0.6	-1.1	-4.8	-3.9	-3.2	-3.6	-3.0	-2.8	-3.0	-3.1	-3.0
Canada	0.1	0.6	0.5	-0.1	0.2	0.0	-8.8	-4.3	-1.6	-1.0	-0.5	-0.5	-0.4	-0.2	0.0
Croatia	-2.1	0.0	2.0	3.3	2.3	4.2	-3.7	-1.8	0.8	0.3	-0.3	0.2	0.4	0.4	0.5
Cyprus	4.3	4.2	3.1	3.5	4.3	2.3	-2.2	-0.1	2.3	2.4	2.2	2.1	1.9	1.7	1.7
Czech Republic	0.4	0.5	1.5	1.5	0.7	-0.3	-4.9	-4.8	-3.2	-3.0	-1.1	-1.0	-0.8	-0.6	-0.4
Denmark	2.9	0.2	0.1	0.7	-0.6	3.2	2.6	2.8	1.9	0.4	-0.3	0.0	-0.2	-0.3	-0.5
Estonia	0.0	-0.3	-0.8	-1.5	-1.5	-0.6	-4.6	-2.9	-0.6	-2.3	-1.9	-1.8	-2.0	-2.2	-2.1
Finland	-0.5	0.3	-0.1	-0.7	-0.9	-1.2	-3.3	-2.4	-1.3	-1.7	-1.4	-1.6	-1.3	-1.0	-1.0
France	-0.5	-0.3	-0.3	-0.4	-0.2	-1.7	-4.8	-4.0	-2.5	-2.7	-2.3	-1.6	-1.3	-1.1	-0.9
Germany	2.0	2.2	2.0	1.7	2.3	1.9	-2.5	-2.6	-2.2	-1.7	-0.3	0.3	0.3	0.4	0.4
Greece	6.9	7.0	9.3	8.9	7.9	5.6	0.0	-1.9	0.6	0.9	1.6	1.7	2.0	2.1	2.2
Hong Kong SAR	3.6	0.7	3.9	4.7	0.9	-1.3	-7.3	-1.7	-7.7	-5.0	-1.8	-1.0	-0.4	0.3	0.2
Iceland	4.5	3.7	14.8	3.1	1.2	-1.3	-3.6	-4.4	-1.2	0.7	0.4	0.6	1.5	1.5	1.0
Ireland ²	0.2	1.0	0.8	1.1	1.4	1.6	-3.3	-1.1	1.7	2.1	2.3	2.2	2.1	1.6	1.3
Israel	-0.4	0.9	0.3	0.7	-1.7	-2.4	-7.7	-0.9	3.0	0.6	0.0	-0.8	-1.1	-1.4	-1.5
Italy	3.7	3.4	3.0	2.2	2.1	2.4	-2.8	-3.2	-3.5	-1.0	0.3	0.6	1.5	1.4	1.5
Japan	-4.9	-3.4	-3.4	-2.7	-2.2	-2.6	-7.5	-4.9	-6.5	-5.5	-3.7	-2.5	-2.5	-2.6	-2.8
Korea	0.3	0.4	1.5	2.0	2.2	0.0	-2.0	-0.3	-1.9	-1.3	-0.9	-0.2	-0.1	0.1	0.1
Latvia	0.4	0.6	0.9	-0.1	-0.5	-0.3	-1.9	-4.5	-3.1	-2.4	-0.4	-0.7	-0.8	-0.3	-0.2
Lithuania	1.3	1.7	2.1	1.7	1.5	1.1	-5.3	-1.4	-1.0	-1.2	-0.7	-0.3	-0.2	-0.1	-0.2
Luxembourg	1.1	1.2	0.8	0.9	2.9	1.9	-2.6	-0.5	-0.8	-2.7	-1.8	-1.5	-1.3	-1.3	-1.4
Malta	1.4	0.7	4.1	4.4	2.2	-0.5	-4.5	-6.2	-5.5	-4.0	-2.3	-1.7	-1.1	-0.4	0.2
The Netherlands	0.5	0.2	1.8	2.2	1.7	1.7	-0.7	-1.4	-0.8	-2.2	-1.8	-1.8	-1.7	-1.5	-1.4
New Zealand	1.0	1.3	1.6	1.8	1.5	-1.6	-3.6	-3.7	-3.8	-3.8	-3.4	-1.3	0.6	2.0	2.5
Norway ²	-8.2	-9.5	-10.4	-10.4	-9.4	-9.8	-14.4	-11.2	-8.6	-12.4	-13.6	-13.3	-13.0	-12.3	-12.3
Portugal	1.4	3.0	3.9	1.3	2.7	2.2	-0.1	0.9	0.6	1.3	2.1	2.1	2.2	2.2	2.2
Singapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Slovak Republic	-0.7	-1.8	-1.6	-0.3	-0.5	-0.6	-3.0	-4.0	-0.9	-4.3	-3.1	-3.1	-3.1	-2.6	-2.6
Slovenia	-1.6	0.8	0.8	2.1	2.4	1.8	-5.0	-4.5	-2.9	-3.2	-2.1	-1.4	-0.9	-0.7	-0.5
Spain ²	1.6	0.4	-0.2	-0.2	0.0	-1.0	-2.6	-2.1	-2.3	-1.8	-0.6	-0.9	-0.8	-0.8	-0.8
Sweden ²	-0.8	-0.6	0.7	0.9	0.3	-0.1	-1.6	-0.7	0.3	-0.1	0.1	0.7	0.6	0.6	0.6
Switzerland ²	0.0	0.8	0.4	1.3	1.1	1.3	-2.3	0.0	0.9	0.2	0.5	0.4	0.3	0.3	0.3
United Kingdom ²	-1.2	-1.1	-0.1	0.5	0.2	-0.3	-9.7	-5.6	-3.2	-2.3	-1.4	-0.9	-1.2	-1.6	-1.7
United States ^{2,3}	-0.8	-0.7	-1.6	-2.3	-2.9	-3.7	-8.6	-9.0	-4.1	-6.0	-4.6	-4.4	-3.7	-3.3	-3.4

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: "Cyclically adjusted primary balance" is defined as the cyclically adjusted balance plus net interest payable/paid (interest expense minus interest revenue) following the *World Economic Outlook* convention. For economy-specific details, see "Data and Conventions" in text and Table B.

¹ Data are based on the fiscal year-based potential GDP.

² The data for these economies include adjustments beyond the output cycle.

³ For cross-economy comparison, expenditures and fiscal balances of the United States are adjusted to exclude the imputed interest on unfunded pension liabilities and the imputed compensation of employees, which are counted as expenditures under the 2008 System of National Accounts (2008 SNA) adopted by the United States, but not in economies that have not yet adopted the 2008 SNA. Data for the United States in this table may therefore differ from data published by the US Bureau of Economic Analysis.

Table A10. Emerging Market and Middle-Income Economies: General Government Primary Balance, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-0.7	-2.4	-2.8	-2.1	-1.7	-2.7	-7.0	-3.4	-3.2	-3.4	-3.1	-2.8	-2.7	-2.6	-2.7
Asia	-0.5	-1.9	-2.4	-2.2	-2.8	-4.3	-8.0	-4.9	-5.7	-5.0	-4.7	-4.6	-4.6	-4.5	-4.5
Europe	-0.4	-1.5	-1.7	-0.8	1.4	0.4	-4.5	-0.9	-1.5	-3.3	-2.2	-1.3	-1.0	-0.8	-0.5
Latin America	-1.4	-1.6	-1.7	-1.5	-1.1	-0.3	-5.1	-0.6	0.5	-0.4	-0.3	0.7	0.9	1.1	1.1
MENA	-1.2	-7.5	-8.6	-4.8	-0.8	-1.3	-7.6	-1.0	3.9	0.7	0.3	0.4	0.4	0.5	0.3
G20 Emerging	-0.8	-2.4	-2.8	-2.2	-2.2	-3.3	-7.5	-3.7	-4.1	-4.1	-3.7	-3.4	-3.3	-3.3	-3.3
Algeria	-7.8	-15.4	-13.1	-7.7	-6.3	-9.0	-11.0	-6.5	-1.4	-7.3	-10.1	-8.3	-7.2	-6.1	-5.6
Angola	-4.7	-1.1	-1.7	-3.0	7.0	6.4	5.0	9.0	4.7	3.4	5.8	6.4	6.3	6.0	6.0
Argentina	-3.5	-4.4	-4.8	-4.2	-2.2	-0.4	-6.2	-2.5	-1.8	-1.6	-0.5	0.4	1.4	2.0	2.0
Belarus	1.1	-1.3	0.3	1.6	3.8	2.6	-1.2	-0.2	-3.0	1.0	2.3	3.3	3.4	3.2	3.2
Brazil	-0.3	-0.4	-1.6	-2.2	-1.0	-0.3	-7.9	2.0	2.1	-1.2	-0.2	0.2	0.7	1.1	1.1
Bulgaria	-3.4	-2.4	1.8	1.2	0.3	-0.8	-2.8	-2.8	-0.8	-2.8	-3.0	-3.1	-2.4	-2.3	-2.3
Chile	-1.4	-1.9	-2.4	-2.3	-1.1	-2.4	-6.6	-6.9	0.9	-2.0	-1.2	-0.5	0.0	0.5	0.5
China	-0.1	-2.0	-2.7	-2.6	-3.5	-5.2	-8.8	-5.1	-6.6	-6.0	-5.8	-5.8	-5.8	-5.8	-5.9
Colombia	-0.2	-1.7	-0.4	-0.5	-2.5	-1.0	-4.4	-4.4	-2.4	0.3	1.7	0.8	0.5	0.6	0.8
Dominican Republic	-0.4	2.3	-0.6	-0.5	0.4	-0.7	-4.7	0.2	-0.4	-0.1	0.2	0.5	0.8	1.1	1.2
Ecuador ¹	-7.9	-6.3	-9.5	-4.7	-1.4	-1.9	-5.6	-1.4	0.5	-0.2	0.2	0.7	0.8	0.9	1.0
Egypt	-4.0	-3.9	-4.1	-2.4	-0.4	1.3	1.2	1.1	0.4	2.3	1.5	2.0	2.0	2.2	2.3
Hungary	1.0	1.3	1.2	0.1	0.2	0.1	-5.3	-5.1	-3.9	-2.8	-0.7	-0.3	0.1	0.0	-0.1
India	-2.6	-2.7	-2.5	-1.5	-1.7	-3.0	-7.3	-4.4	-4.1	-3.4	-2.9	-2.5	-2.3	-2.2	-2.2
Indonesia	-0.9	-1.2	-1.0	-0.9	-0.1	-0.4	-4.1	-2.5	-0.4	-0.2	-0.1	0.0	0.0	0.1	0.1
Iran	-1.0	-1.4	-1.3	-1.0	-0.8	-3.5	-4.6	-3.2	-3.1	-3.0	-2.9	-2.8	-2.7	-2.5	-2.4
Kazakhstan	2.0	-5.9	-4.3	-5.2	1.8	-0.8	-7.7	-4.4	0.8	0.2	0.0	0.2	-0.1	-0.3	-0.5
Kuwait ²	12.6	-7.5	-14.2	-9.9	-4.3	-8.6	-28.3	-14.3	7.2	0.6	-3.4	-4.5	-6.3	-8.9	-10.6
Lebanon	2.5	1.4	0.4	0.8	-1.4	-0.3	-0.5	1.9	-4.3	...	...	...	...	...	...
Malaysia	-0.9	-0.9	-0.8	-0.6	-0.8	0.0	-3.1	-3.7	-3.8	-2.3	-1.8	-1.6	-1.5	-1.5	-1.3
Mexico	-1.7	-1.2	0.3	2.5	1.5	1.4	-0.5	0.0	0.7	1.6	-0.7	1.8	1.6	1.5	1.4
Morocco	-2.2	-2.0	-2.0	-0.9	-1.2	-1.4	-4.6	-3.9	-3.1	-2.4	-1.5	-1.0	-0.6	-0.3	-0.2
Oman	-1.9	-14.1	-20.0	-11.1	-5.2	-4.6	-13.0	-0.9	8.0	6.8	6.6	4.8	4.3	3.8	3.3
Pakistan	-0.3	-0.5	-0.1	-1.4	-1.8	-3.0	-1.5	-1.1	-3.0	-1.2	0.4	0.5	0.5	0.4	0.4
Peru	0.7	-1.2	-1.3	-1.9	-0.9	-0.2	-6.9	-1.2	0.0	-0.7	-0.2	0.2	0.7	0.9	0.8
Philippines	3.5	2.1	1.0	0.9	0.2	0.1	-3.7	-4.4	-3.5	-2.6	-1.8	-1.4	-1.0	-0.4	-0.1
Poland	-1.7	-0.8	-0.7	0.1	1.2	0.6	-5.6	-0.7	-2.2	-3.5	-2.9	-2.6	-2.7	-2.4	-1.9
Qatar	16.6	23.1	-3.4	-1.2	7.3	6.6	3.6	6.1	14.9	12.1	11.3	10.3	10.1	10.1	9.8
Romania	-0.5	-0.1	-1.3	-1.8	-1.4	-3.4	-8.3	-5.3	-3.8	-3.9	-3.8	-4.0	-3.7	-3.7	-3.4
Russian Federation	-0.7	-3.1	-3.2	-1.0	3.4	2.2	-3.7	1.1	-1.1	-3.4	-2.3	-1.0	-0.3	0.1	0.4
Saudi Arabia	-4.2	-17.5	-16.5	-11.3	-6.0	-4.2	-12.5	-2.0	2.5	0.2	0.7	1.0	1.2	1.4	1.0
South Africa	-1.2	-1.4	-0.6	-0.8	-0.4	-1.1	-5.5	-1.3	-0.2	-1.2	-0.8	-0.6	0.3	0.7	0.8
Sri Lanka	-1.9	-2.1	-0.2	0.0	0.6	-1.9	-5.9	-5.7	-3.7	...	...	...	...	...	...
Thailand	-0.1	0.7	1.0	0.1	0.7	-0.2	-3.9	-6.1	-3.5	-1.7	-1.5	-1.6	-1.5	-1.3	-1.2
Türkiye	0.5	0.6	-1.0	-0.9	-2.3	-2.9	-3.2	-2.3	-0.4	-3.1	-0.8	-0.3	-0.4	-0.4	-0.4
Ukraine	-1.2	3.0	1.6	1.4	1.2	1.0	-3.0	-1.1	-12.6	-14.7	-12.3	-5.3	-1.1	0.0	1.4
United Arab Emirates	2.1	-6.3	-2.9	0.0	4.0	2.9	-2.2	4.3	10.4	5.7	5.0	4.5	4.3	4.0	3.6
Uruguay ³	-0.5	0.2	-0.3	-0.2	0.5	-0.5	-2.1	-0.6	-0.5	-1.7	-1.1	-0.8	-0.4	-0.2	0.0
Venezuela	-7.5	-6.8	-7.7	-13.1	-30.3	-10.0	-4.9	-4.6	-5.8	...	...	...	...	...	...

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: "Primary balance" is defined as the overall balance, excluding net interest payments. For country-specific details, see "Data and Conventions" in text and Table C. MENA = Middle East and North Africa.

¹ The data for Ecuador reflect primary balance of the nonfinancial public sector.

² Interest revenue is proxied by IMF staff estimates of investment income. The country team does not have the breakdown of investment income between interest revenue and dividends.

³ Data are for the nonfinancial public sector, which includes central government, local government, social security funds, nonfinancial public corporations, and Banco de Seguros del Estado. The coverage of fiscal data was changed from the consolidated public sector to the nonfinancial public sector with the October 2019 submission. With this narrower coverage, the central bank balances are not included in the fiscal data. Historical data were also revised accordingly. Starting in October 2018, the 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 2018–22 are affected by these transfers, which amounted to 1.2 percent of GDP in 2018, 1.1 percent of GDP in 2019, 0.6 percent of GDP in 2020, and 0.3 percent of GDP in 2021 and are projected to be 0.1 percent of GDP in 2022 and 0 thereafter. See IMF Country Report No. 19/64 for further details. The disclaimer about the public pension system applies only to the revenues and net lending/borrowing series.

Table A11. Emerging Market and Middle-Income Economies: General Government Cyclically Adjusted Balance, 2014–28
(Percent of potential GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-2.6	-3.5	-3.8	-3.7	-3.7	-4.6	-7.3	-5.1	-5.6	-6.0	-5.9	-5.7	-5.7	-5.7	-5.7
Asia	-1.7	-2.8	-3.6	-3.5	-4.2	-5.5	-8.1	-5.9	-6.6	-6.5	-6.5	-6.7	-6.9	-7.0	-7.0
Europe	-1.1	-2.2	-2.2	-1.6	-0.2	-0.9	-4.7	-2.1	-2.9	-5.2	-4.1	-3.3	-2.8	-2.6	-2.3
Latin America	-5.1	-5.7	-4.7	-5.1	-4.3	-3.3	-6.3	-3.7	-3.6	-4.9	-4.7	-3.3	-3.0	-2.8	-2.7
MENA	-9.6	-10.7	-10.3	-8.2	-7.4	-7.8	-8.0	-7.2	-4.2	-5.4	-7.3	-7.7	-7.2	-6.5	-5.9
G20 Emerging	-2.5	-3.6	-3.9	-3.8	-3.9	-4.9	-7.8	-5.1	-5.8	-6.3	-6.2	-6.0	-6.1	-6.1	-6.2
Algeria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Angola	-9.6	-1.4	-2.9	-4.7	3.2	2.0	1.3	4.4	1.4	-0.4	1.2	1.0	1.1	1.9	1.3
Argentina	-3.4	-6.2	-6.0	-7.2	-5.0	-3.4	-5.0	-3.3	-3.8	-2.3	-2.3	-1.0	0.0	0.3	0.2
Belarus	-0.8	-2.3	0.0	0.4	1.5	0.3	-3.0	-2.6	-3.4	-0.2	0.6	1.3	1.3	1.2	1.0
Brazil	-7.5	-8.6	-6.0	-7.2	-6.2	-4.4	-10.2	-2.2	-3.2	-7.7	-6.2	-5.4	-4.9	-4.5	-4.4
Bulgaria	-3.0	-2.7	1.4	0.6	-0.2	-1.9	-1.4	-2.9	-1.1	-2.7	-3.1	-3.5	-2.8	-2.7	-2.7
Chile ¹	-0.5	0.5	-1.0	-2.0	-1.5	-1.7	-1.6	-11.9	-1.9	-3.4	-2.3	-1.8	-1.2	-0.9	-0.7
China	-0.7	-2.2	-3.1	-3.2	-4.1	-5.8	-8.4	-5.6	-6.6	-6.6	-6.7	-7.0	-7.4	-7.6	-7.8
Colombia	-2.4	-3.9	-2.6	-2.3	-4.2	-2.5	-4.9	-7.4	-7.7	-4.0	-2.5	-3.1	-3.1	-2.8	-2.6
Dominican Republic	-4.3	-4.2	-3.8	-3.7	-3.3	-3.2	-7.6	-3.4	-3.5	-4.0	-3.9	-3.5	-3.4	-2.9	-2.6
Ecuador ²	-8.9	-8.0	-10.1	-5.2	-3.4	-3.4	-4.9	-1.3	-0.8	-0.8	-1.0	-0.4	-0.2	-0.2	0.0
Egypt	-11.0	-10.8	-11.4	-10.1	-9.0	-7.3	-6.6	-7.1	-6.0	-4.6	-10.1	-10.7	-10.0	-8.8	-7.8
Hungary	-1.3	-1.1	-0.6	-1.8	-2.3	-2.9	-6.7	-7.1	-6.2	-4.9	-3.5	-2.6	-2.1	-2.0	-1.5
India	-6.6	-7.0	-7.4	-6.2	-6.8	-7.6	-9.1	-8.7	-9.3	-8.8	-8.5	-8.0	-7.7	-7.4	-7.2
Indonesia	-2.3	-2.7	-2.5	-2.4	-1.8	-2.1	-5.3	-3.9	-2.1	-2.2	-2.2	-2.1	-2.1	-2.1	-2.0
Iran	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kazakhstan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kuwait	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lebanon	-13.5	-11.6	-11.5	-13.7	-12.7	-18.4	-12.1	-2.4	0.2	...	...	...	...	...	...
Malaysia	-2.6	-2.6	-2.7	-2.6	-3.6	-1.6	-3.9	-5.0	-6.2	-4.9	-4.5	-4.5	-4.5	-4.4	-4.2
Mexico	-4.4	-4.2	-4.0	-2.7	-2.7	-2.8	-3.6	-3.3	-4.3	-4.2	-5.7	-2.7	-2.7	-2.7	-2.7
Morocco	-6.1	-4.8	-4.9	-4.3	-3.9	-3.8	-5.5	-6.0	-5.1	-5.0	-4.4	-3.8	-3.5	-3.3	-3.0
Oman	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pakistan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peru	-0.1	-1.5	-1.9	-2.2	-1.9	-0.9	-6.0	-3.9	-2.0	-2.1	-1.9	-1.6	-1.2	-1.1	-1.1
Philippines	1.2	0.2	-0.8	-0.8	-1.5	-1.5	-3.3	-5.3	-5.6	-4.8	-4.3	-4.0	-3.5	-2.8	-2.4
Poland	-2.9	-2.2	-1.7	-1.6	-1.5	-2.4	-5.4	-2.1	-5.0	-5.0	-4.2	-4.4	-4.8	-4.5	-4.0
Qatar	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Romania	-1.0	-0.4	-1.4	-3.1	-3.8	-5.7	-8.2	-6.8	-6.2	-6.1	-5.8	-5.8	-5.6	-5.6	-5.4
Russian Federation	-0.1	-3.1	-3.2	-1.0	2.9	2.0	-4.4	0.5	-1.1	-3.8	-2.7	-1.5	-0.8	-0.3	0.1
Saudi Arabia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South Africa	-4.0	-4.2	-3.6	-3.8	-3.7	-4.4	-5.9	-5.1	-5.7	-6.2	-6.3	-6.3	-6.4	-6.5	-6.7
Sri Lanka	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thailand	-0.7	0.4	0.8	-0.4	-0.1	-1.0	-3.6	-5.8	-4.0	-2.4	-2.2	-2.7	-2.6	-2.4	-1.2
Türkiye	-1.6	-1.6	-2.1	-2.9	-4.2	-4.0	-3.6	-4.4	-2.3	-6.3	-4.3	-3.8	-3.6	-3.5	-3.4
Ukraine	-3.2	1.5	-0.9	-1.4	-2.2	-1.7	-4.4	-3.3	-15.0	...	...	...	...	...	...
United Arab Emirates	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uruguay ³	-3.5	-2.1	-2.7	-2.7	-1.9	-2.0	-3.0	-1.5	-2.1	-2.8	-2.4	-2.2	-2.0	-1.9	-1.7
Venezuela	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: For country-specific details, see "Data and Conventions" in text and Table C. MENA = Middle East and North Africa.

¹Data for these economies include adjustments beyond the output cycle.

²The data for Ecuador reflect cyclically adjusted balance of the nonfinancial public sector.

³Data are for the nonfinancial public sector, which includes central government, local government, social security funds, nonfinancial public corporations, and Banco de Seguros del Estado. The coverage of fiscal data was changed from the consolidated public sector to the nonfinancial public sector with the October 2019 submission. With this narrower coverage, the central bank balances are not included in the fiscal data. Historical data were also revised accordingly. Starting in October 2018, the 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 2018–22 are affected by these transfers, which amounted to 1.2 percent of GDP in 2018, 1.1 percent of GDP in 2019, 0.6 percent of GDP in 2020, and 0.3 percent of GDP in 2021 and are projected to be 0.1 percent of GDP in 2022 and 0 thereafter. See IMF Country Report No. 19/64 for further details. The disclaimer about the public pension system applies only to the revenues and net lending/borrowing series.

Table A12. Emerging Market and Middle-Income Economies: General Government Cyclically Adjusted Primary Balance, 2014–28
(Percent of potential GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-0.8	-1.6	-1.9	-1.7	-1.8	-2.7	-5.5	-3.3	-3.6	-3.7	-3.3	-3.1	-3.0	-3.0	-2.9
Asia	-0.4	-1.7	-2.2	-2.0	-2.8	-4.1	-6.5	-4.4	-5.0	-4.6	-4.5	-4.5	-4.6	-4.5	-4.5
Europe	0.1	-0.9	-1.1	-0.5	1.0	0.2	-3.7	-1.0	-2.0	-3.8	-2.4	-1.5	-1.1	-0.9	-0.6
Latin America	-1.8	-1.4	-1.2	-1.1	-0.3	0.2	-3.2	-0.5	0.3	-0.4	-0.3	0.7	0.9	1.1	1.1
MENA	-5.2	-6.2	-5.1	-3.5	-2.2	-2.3	-2.6	-2.2	0.2	-0.8	-0.5	0.0	0.3	0.6	0.9
G20 Emerging	-0.7	-1.7	-2.1	-1.8	-2.0	-3.1	-6.0	-3.3	-3.8	-4.0	-3.7	-3.5	-3.5	-3.4	-3.5
Algeria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Angola	-8.4	0.2	-0.3	-1.5	7.6	7.1	6.9	9.4	5.2	4.5	5.9	6.2	6.2	6.1	6.1
Argentina	-2.7	-4.6	-4.1	-4.7	-1.8	0.5	-2.8	-1.5	-1.8	-0.1	0.8	1.3	1.9	2.3	2.2
Belarus	0.2	-0.6	1.9	2.4	3.5	2.1	-1.4	-1.1	-2.4	1.5	2.3	3.1	3.0	2.7	2.5
Brazil	-1.8	-0.2	-0.2	-1.1	-0.2	0.3	-6.3	2.2	2.1	-1.7	-0.4	0.2	0.7	1.1	1.1
Bulgaria	-2.8	-2.3	1.7	0.9	0.0	-1.8	-1.3	-2.9	-1.1	-2.6	-2.9	-3.1	-2.4	-2.3	-2.3
Chile ¹	-0.4	0.7	-0.7	-1.7	-1.2	-1.4	-1.1	-11.2	-2.4	-3.7	-2.1	-1.5	-0.9	-0.6	-0.5
China	-0.2	-1.7	-2.5	-2.5	-3.3	-4.9	-7.5	-4.7	-5.7	-5.4	-5.4	-5.6	-5.7	-5.8	-5.9
Colombia	-0.8	-2.1	-0.6	-0.3	-2.0	0.1	-2.4	-4.4	-3.3	0.5	2.4	1.1	0.6	0.8	1.1
Dominican Republic	-2.0	-1.9	-1.3	-1.2	-0.7	-0.5	-4.6	-0.3	-0.7	-0.9	-0.6	-0.2	0.0	0.5	0.8
Ecuador ²	-8.7	-7.6	-9.5	-4.1	-2.0	-1.9	-3.4	-1.1	-0.3	0.1	0.1	0.8	1.0	1.1	1.3
Egypt	-4.3	-4.4	-3.7	-2.6	-0.5	1.5	2.0	0.9	0.2	2.3	2.1	2.5	2.1	2.2	2.3
Hungary	2.3	2.2	2.3	0.8	0.0	-0.7	-4.5	-5.0	-3.9	-2.3	-0.4	-0.2	0.1	0.0	-0.1
India	-2.2	-2.5	-2.8	-1.4	-2.0	-2.9	-3.9	-3.7	-4.2	-3.4	-2.9	-2.5	-2.3	-2.2	-2.2
Indonesia	-1.1	-1.3	-1.0	-0.8	0.0	-0.4	-3.3	-2.0	-0.2	-0.1	-0.1	0.0	0.0	0.1	0.2
Iran	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kazakhstan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kuwait	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lebanon	-4.9	-2.8	-2.1	-3.9	-2.1	-7.4	-9.4	-1.3	0.7	...	...	...	...	...	...
Malaysia	-0.8	-1.0	-0.9	-0.8	-1.7	0.4	-2.3	-2.9	-4.1	-2.5	-2.0	-1.8	-1.7	-1.5	-1.3
Mexico	-1.7	-1.4	-0.9	0.9	1.1	1.0	0.0	0.3	0.7	1.4	-0.9	1.7	1.6	1.5	1.4
Morocco	-3.5	-2.3	-2.5	-1.9	-1.6	-1.7	-3.1	-3.9	-3.1	-2.5	-1.6	-1.0	-0.6	-0.3	-0.2
Oman	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pakistan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peru	0.8	-0.6	-1.0	-1.2	-0.7	0.3	-4.0	-2.6	-0.7	-0.7	-0.3	-0.2	0.0	0.0	0.0
Philippines	3.3	2.2	1.0	0.8	0.1	0.1	-1.7	-3.5	-3.6	-2.6	-1.8	-1.4	-1.0	-0.4	-0.1
Poland	-0.9	-0.5	0.0	-0.1	-0.1	-1.0	-4.1	-1.0	-3.4	-3.3	-2.4	-2.4	-2.6	-2.4	-1.9
Qatar	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Romania	0.4	0.8	-0.2	-2.0	-2.4	-4.5	-6.9	-5.3	-4.1	-3.8	-3.7	-3.9	-3.7	-3.7	-3.4
Russian Federation	0.3	-2.8	-2.8	-0.5	3.4	2.3	-4.1	0.8	-0.8	-3.5	-2.5	-1.2	-0.5	-0.1	0.2
Saudi Arabia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South Africa	-1.2	-1.2	-0.5	-0.6	-0.3	-0.9	-2.1	-1.0	-1.2	-1.0	-0.7	-0.2	0.4	0.7	0.8
Sri Lanka	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thailand	0.0	0.9	1.2	0.2	0.5	-0.3	-3.0	-4.9	-3.0	-1.3	-1.1	-1.5	-1.4	-1.2	0.0
Türkiye	0.4	0.2	-0.8	-1.6	-2.6	-2.2	-1.8	-2.7	-1.0	-4.0	-1.4	-0.8	-0.6	-0.4	-0.4
Ukraine	0.0	5.4	3.0	2.3	1.1	1.3	-1.6	-0.5	-11.8	...	...	...	...	...	...
United Arab Emirates	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uruguay ³	-1.4	0.1	-0.3	-0.3	0.5	0.1	-0.5	0.4	-0.1	-1.3	-0.9	-0.6	-0.2	-0.1	0.1
Venezuela	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: "Cyclically adjusted primary balance" is defined as the cyclically adjusted balance plus net interest payable/paid (interest expense minus interest revenue) following the *World Economic Outlook* convention. For country-specific details, see "Data and Conventions" in text and Table C. MENA = Middle East and North Africa.

¹ Data for these economies include adjustments beyond the output cycle. For country-specific details, see "Data and Conventions" in text and Table C.

² The data for Ecuador reflect cyclically adjusted primary balance of the nonfinancial public sector.

³ Data are for the nonfinancial public sector, which includes central government, local government, social security funds, nonfinancial public corporations, and Banco de Seguros del Estado. The coverage of fiscal data was changed from the consolidated public sector to the nonfinancial public sector with the October 2019 submission. With this narrower coverage, the central bank balances are not included in the fiscal data. Historical data were also revised accordingly. Starting in October 2018, the 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 2018–22 are affected by these transfers, which amounted to 1.2 percent of GDP in 2018, 1.1 percent of GDP in 2019, 0.6 percent of GDP in 2020, and 0.3 percent of GDP in 2021 and are projected to be 0.1 percent of GDP in 2022 and 0 thereafter. See IMF Country Report No. 19/64 for further details. The disclaimer about the public pension system applies only to the revenues and net lending/borrowing series.

Table A16. Emerging Market and Middle-Income Economies: General Government Net Debt, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average ¹	24.1	28.5	34.1	35.5	36.3	38.0	45.4	45.0	42.4	42.8	43.0	43.6	44.1	44.5	44.7
Asia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Europe	29.1	28.2	30.3	28.9	29.2	28.9	35.7	36.2	30.6	32.4	32.2	32.8	33.8	34.2	34.3
Latin America	31.4	34.5	39.9	42.1	42.6	43.8	50.8	48.3	48.7	49.7	51.6	52.6	53.3	54.0	54.5
MENA	-3.0	12.6	26.9	27.6	28.9	33.2	43.2	45.5	37.0	36.1	33.3	33.6	33.9	33.9	34.1
G20 Emerging	22.9	25.7	31.6	34.6	35.4	36.9	43.9	43.3	40.5	42.0	42.9	43.6	44.1	44.4	44.7
Algeria	-21.8	-7.6	13.3	21.6	25.7	30.5	43.8	51.7	41.2	48.9	55.6	60.7	65.0	68.4	71.3
Angola	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Argentina	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Belarus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Brazil	32.6	35.6	46.1	51.4	52.8	54.7	61.4	55.8	57.1	60.7	63.7	66.2	68.0	69.4	70.8
Bulgaria	13.1	15.4	11.3	10.3	9.0	8.4	13.3	12.7	11.2	11.4	13.8	16.4	18.3	20.1	21.7
Chile	-4.4	-3.5	0.9	4.4	5.7	8.0	13.3	20.1	19.6	21.2	22.2	22.5	22.2	21.5	20.8
China ²	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Colombia	32.9	42.1	38.6	38.6	43.1	43.1	54.7	54.1	54.9	52.6	50.8	49.6	49.1	48.8	48.5
Dominican Republic	37.6	37.2	38.5	40.3	41.4	43.4	57.5	49.5	46.6	46.8	46.4	45.5	44.5	43.1	41.5
Ecuador	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Egypt	73.2	75.3	81.6	86.6	80.7	74.6	80.6	85.2	83.9	88.0	83.4	79.2	76.8	74.2	71.8
Hungary	70.3	70.5	67.9	65.2	62.1	58.4	72.3	69.6	66.4	61.8	58.8	57.1	55.2	53.3	50.7
India	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Indonesia	20.4	22.0	23.5	25.3	26.7	27.0	36.1	37.9	37.3	36.4	36.2	36.0	35.8	35.6	35.4
Iran	-3.4	21.6	36.4	32.9	31.5	36.9	40.3	36.1	28.7	25.6	25.6	27.0	28.5	29.8	30.7
Kazakhstan	-19.1	-30.8	-23.8	-15.8	-15.8	-13.9	-8.6	-3.3	-1.2	-0.1	0.2	0.5	1.1	2.0	3.0
Kuwait	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lebanon	130.0	134.4	140.7	144.4	150.8	167.1	147.9	346.4	283.9	...	...	...	...	...	...
Malaysia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mexico	41.1	44.9	47.2	44.5	43.6	43.3	50.2	49.3	48.0	46.6	48.7	49.1	49.4	49.9	50.2
Morocco	58.1	57.8	59.6	59.9	60.2	60.0	71.6	68.9	71.1	69.3	68.6	68.3	68.0	67.4	66.5
Oman	-39.3	-37.0	-24.2	-10.4	6.4	11.2	27.7	24.9	12.9	6.9	2.3	0.6	-0.9	-1.8	-1.4
Pakistan	52.9	53.3	55.1	55.9	59.9	70.2	72.9	66.0	69.9	71.6	68.3	67.0	65.3	63.9	61.8
Peru	2.7	5.3	6.9	8.7	10.2	11.1	21.0	19.8	19.9	20.7	21.5	21.5	20.9	20.1	19.4
Philippines	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Poland	45.4	46.4	47.9	44.4	41.5	38.5	44.9	40.7	37.2	39.1	42.1	44.3	46.7	48.3	49.6
Qatar	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Romania	28.4	28.3	26.8	25.9	26.2	28.6	37.8	40.6	39.1	40.1	42.0	44.8	46.9	49.1	51.2
Russian Federation	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saudi Arabia	-46.4	-35.1	-16.6	-7.4	-0.1	4.7	15.1	17.0	10.0	9.5	8.8	8.1	7.1	5.9	5.1
South Africa	38.1	41.0	42.1	43.8	46.6	50.6	62.1	63.0	66.4	71.2	74.2	77.5	80.5	83.1	85.7
Sri Lanka	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thailand	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Türkiye	23.7	22.8	23.3	22.1	24.0	25.5	30.2	33.8	23.8	27.9	26.0	25.3	25.2	24.3	23.2
Ukraine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
United Arab Emirates	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uruguay ³	40.8	44.4	44.3	44.2	46.7	50.0	57.3	53.3	50.5	52.9	52.8	53.2	53.3	53.3	53.0
Venezuela	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: For country-specific details, see "Data and Conventions" in text and Table C. MENA = Middle East and North Africa.

¹ The average does not include the debt incurred by the European Union and used to finance the grants portion of the NextGenerationEU package. This totaled €58 billion (0.4 percent of EU GDP) as of December 31, 2021, and €158 billion (1 percent of EU GDP) as of February 16, 2023. Debt incurred by the European Union and used to on-lend to member states is included within member state debt data and regional aggregates.

² China's deficit and public debt numbers presented in this table cover a narrower perimeter of the general government than IMF staff's estimates in China Article IV reports (see IMF 2023 for a reconciliation of the two estimates).

³ Data are for the nonfinancial public sector, which includes central government, local government, social security funds, nonfinancial public corporations, and Banco de Seguros del Estado. The coverage of fiscal data was changed from the consolidated public sector to the nonfinancial public sector with the October 2019 submission. With this narrower coverage, the central bank balances are not included in the fiscal data. Historical data were also revised accordingly.

Table A17. Low-Income Developing Countries: General Government Overall Balance, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-3.1	-3.8	-3.7	-3.6	-3.3	-3.5	-5.0	-4.4	-3.8	-3.6	-3.3	-3.2	-3.2	-3.2	-3.2
Oil Producers	-2.9	-4.6	-5.3	-5.4	-4.1	-4.5	-5.3	-5.6	-5.0	-4.7	-4.0	-4.1	-4.3	-4.5	-4.8
Asia	-3.5	-3.8	-3.2	-3.1	-2.8	-3.0	-4.3	-3.5	-2.5	-3.3	-3.4	-3.5	-3.6	-3.5	-3.5
Latin America	-2.7	-1.2	-0.6	-0.7	-1.0	-0.6	-3.4	-2.5	0.3	-1.2	-1.2	-1.2	-1.2	-1.0	-1.1
Sub-Saharan Africa	-3.3	-4.1	-4.5	-4.5	-4.0	-4.0	-5.8	-5.5	-5.1	-4.0	-3.4	-3.2	-3.2	-3.2	-3.2
Others	-1.7	-3.1	-2.5	-2.3	-1.9	-3.0	-3.5	-2.0	-2.9	-3.8	-3.0	-2.5	-2.2	-2.2	-2.0
Afghanistan	-1.7	-1.4	0.1	-0.7	1.6	-1.1	-2.2	-0.3	...	...	...	...	...	...	...
Bangladesh	-2.6	-3.3	-3.2	-4.2	-4.1	-5.4	-4.8	-3.6	-4.1	-4.5	-4.5	-4.5	-5.0	-5.0	-5.0
Benin	-1.7	-5.6	-4.3	-4.2	-3.0	-0.5	-4.7	-5.7	-5.6	-4.3	-3.7	-2.9	-2.9	-2.9	-2.9
Burkina Faso	-1.7	-2.1	-3.1	-6.9	-4.4	-3.4	-5.1	-7.4	-10.7	-6.6	-5.6	-4.7	-3.8	-3.0	-3.0
Cambodia	-1.6	-0.6	-0.3	-0.8	0.7	3.0	-3.4	-7.1	-0.9	-4.5	-3.0	-2.9	-2.7	-2.6	-2.7
Cameroon	-4.1	-4.2	-5.9	-4.7	-2.4	-3.2	-3.2	-3.0	-1.1	-0.8	-0.6	-0.3	-0.7	-1.0	-1.0
Chad	-4.2	-4.4	-1.9	-0.2	1.9	-0.1	1.6	-2.0	5.1	8.3	0.8	1.7	1.5	2.4	1.7
Congo, Democratic Republic of the	0.0	-0.4	-0.5	1.3	-1.1	-2.4	-3.3	-2.0	-0.8	-2.0	-2.0	-2.4	-1.8	-2.4	-1.8
Congo, Republic of	-10.7	-17.8	-14.5	-5.6	5.2	4.3	-1.1	1.6	8.9	4.1	5.0	3.6	2.7	3.4	3.8
Côte d'Ivoire	-1.6	-2.0	-3.0	-3.3	-2.9	-2.2	-5.4	-4.9	-6.8	-5.2	-4.1	-3.0	-3.0	-2.8	-2.8
Ethiopia	-2.6	-1.9	-2.3	-3.2	-3.0	-2.5	-2.8	-2.8	-4.2	-2.7	-2.0	-2.5	-3.0	-3.0	-3.0
Ghana	-7.8	-4.0	-6.7	-4.0	-6.8	-7.5	-17.4	-12.0	-11.2	-4.6	-4.1	-3.5	-3.0	-2.6	-2.8
Guinea	-3.2	-6.6	-0.1	-2.1	-1.1	-0.3	-3.1	-1.8	-0.7	-2.3	-2.4	-2.3	-2.4	-2.6	-2.2
Haiti	-3.6	-1.5	0.1	-0.3	-1.1	-2.0	-2.5	-2.6	-2.1	-1.5	-1.8	-1.8	-1.9	-2.0	-2.0
Honduras	-2.9	-0.8	-0.4	-0.4	0.2	0.1	-4.5	-3.1	1.6	-1.9	-1.7	-1.5	-1.4	-1.0	-1.1
Kenya	-5.8	-6.7	-7.5	-7.4	-6.9	-7.4	-8.1	-7.2	-5.8	-4.7	-4.1	-3.7	-3.6	-3.8	-3.8
Kyrgyz Republic	-3.1	-2.5	-5.8	-3.7	-0.6	-0.1	-3.1	-0.7	-0.3	-1.8	-3.3	-3.1	-3.2	-3.4	-3.6
Lao P.D.R.	-3.1	-5.6	-4.9	-5.5	-4.7	-3.3	-5.6	-1.3	-1.6	-3.4	-3.5	-3.4	-3.5	-3.0	-2.9
Madagascar	-2.0	-2.9	-1.1	-2.1	-1.3	-1.4	-3.9	-2.6	-6.4	-3.9	-3.4	-5.1	-4.0	-4.5	-4.1
Malawi	-3.1	-4.2	-4.9	-5.2	-4.3	-4.5	-8.2	-8.6	-9.3	-6.8	-8.0	-7.5	-5.0	-4.3	-3.0
Mali	-2.9	-1.8	-3.9	-2.9	-4.7	-1.7	-5.4	-4.8	-4.8	-4.8	-4.4	-3.7	-3.0	-3.0	-3.0
Moldova	-1.6	-1.9	-1.5	-0.7	-0.9	-1.5	-5.3	-2.6	-3.2	-6.0	-4.6	-3.8	-3.4	-3.1	-2.6
Mozambique	-9.9	-6.7	-5.1	-2.0	-5.6	1.7	-5.4	-3.6	-5.0	-2.8	-2.2	-1.0	-0.5	0.7	2.1
Myanmar	-1.3	-2.8	-3.9	-2.9	-3.4	-3.9	-5.6	-11.0	-5.1	-4.5	-4.6	-4.6	-4.2	-3.7	-3.4
Nepal	1.3	0.6	1.2	-2.7	-5.8	-5.0	-5.4	-4.0	-3.2	-5.9	-4.9	-4.3	-3.9	-3.3	-2.9
Nicaragua	-1.2	-1.5	-1.8	-1.6	-3.0	-0.3	-2.3	-1.2	0.8	0.8	0.4	0.4	0.4	0.4	0.4
Niger	-6.1	-6.7	-4.5	-4.1	-3.0	-3.6	-4.8	-5.9	-6.8	-4.9	-4.1	-3.0	-3.0	-3.0	-3.0
Nigeria	-2.4	-3.8	-4.6	-5.4	-4.3	-4.7	-5.6	-6.0	-5.6	-5.4	-4.5	-4.5	-4.7	-5.0	-5.3
Papua New Guinea	-6.3	-4.5	-4.7	-2.5	-2.6	-4.4	-8.9	-6.8	-5.3	-4.4	-4.0	-2.5	-1.4	-0.2	0.0
Rwanda	-3.9	-2.7	-2.3	-2.5	-2.6	-5.1	-9.5	-7.0	-5.8	-5.0	-7.3	-4.0	-3.3	-3.3	-3.3
Senegal	-3.9	-3.7	-3.3	-3.0	-3.7	-3.9	-6.4	-6.3	-6.6	-5.0	-3.9	-3.3	-2.6	-2.4	-3.0
Sudan	-4.7	-3.9	-3.9	-6.1	-7.9	-10.8	-5.9	-0.3	-2.5	-4.2	-2.7	-1.4	-1.7	-1.3	-0.1
Tajikistan	0.8	-2.0	-9.0	-5.7	-2.7	-2.1	-4.3	-0.7	-0.2	-2.5	-2.5	-2.5	-2.5	-2.5	-2.5
Tanzania	-2.9	-3.2	-2.1	-1.2	-1.9	-2.0	-2.5	-3.4	-3.7	-3.3	-2.6	-2.5	-2.5	-2.5	-2.5
Uganda	-2.7	-2.5	-2.6	-3.6	-3.0	-4.8	-7.5	-7.5	-5.8	-4.2	-2.7	-2.4	-2.1	-1.1	1.2
Uzbekistan	1.9	-0.3	0.7	1.1	2.0	-0.3	-3.3	-4.6	-4.2	-4.6	-3.9	-3.3	-2.8	-2.8	-2.9
Vietnam	-5.0	-5.0	-3.2	-2.0	-1.0	-0.4	-2.9	-1.4	0.3	-1.3	-1.7	-2.1	-2.1	-2.1	-2.0
Yemen	-4.1	-8.7	-8.5	-4.9	-7.8	-5.9	-4.5	-0.9	-2.6	-2.7	0.0	-0.9	-0.6	-0.5	-0.1
Zambia	-5.4	-8.9	-5.7	-7.5	-8.3	-9.4	-13.8	-8.1	-7.7	-6.0	-4.6	-3.4	-4.4	-2.2	-1.2
Zimbabwe	-1.1	-1.8	-6.6	-10.6	-5.4	-0.9	0.8	-2.2	-2.0	-4.1	-3.2	-2.7	-2.2	-2.2	-2.1

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: For country-specific details, see "Data and Conventions" in text and Table D.

Table A18. Low-Income Developing Countries: General Government Primary Balance, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average	-1.9	-2.5	-2.3	-2.2	-1.7	-1.9	-3.2	-2.5	-1.8	-1.8	-1.4	-1.3	-1.3	-1.3	-1.2
Oil Producers	-1.6	-3.1	-3.7	-4.1	-2.5	-2.8	-3.3	-3.3	-2.3	-2.1	-1.2	-1.3	-1.5	-1.6	-1.7
Asia	-2.0	-2.3	-1.7	-1.7	-1.3	-1.6	-2.7	-1.9	-0.9	-1.7	-1.9	-2.0	-2.1	-2.0	-2.0
Latin America	-2.4	-0.7	-0.1	-0.2	-0.4	0.2	-2.6	-1.7	1.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2
Sub-Saharan Africa	-2.2	-2.8	-2.9	-2.8	-2.0	-2.0	-3.7	-3.1	-2.6	-1.6	-0.9	-0.8	-0.8	-0.8	-0.7
Others	-0.4	-1.8	-1.6	-2.0	-1.7	-2.7	-3.1	-1.8	-2.5	-3.4	-2.5	-2.0	-1.7	-1.6	-1.5
Afghanistan	-1.7	-1.3	0.2	-0.6	1.7	-1.0	-2.2	-0.3	...	...	...	...	...	...	...
Bangladesh	-0.9	-1.6	-1.6	-2.6	-2.5	-3.7	-3.0	-1.6	-2.2	-2.4	-2.6	-2.6	-3.2	-3.1	-3.1
Benin	-1.4	-5.0	-3.4	-2.8	-1.4	1.1	-2.7	-3.5	-3.9	-2.7	-2.1	-1.3	-1.4	-1.4	-1.4
Burkina Faso	-1.1	-1.5	-2.2	-6.0	-3.3	-2.1	-3.8	-5.7	-8.7	-4.5	-3.0	-2.0	-1.2	-0.4	-0.4
Cambodia	-1.3	-0.3	0.1	-0.5	1.0	3.3	-3.0	-6.7	-0.5	-4.3	-2.8	-2.7	-2.5	-2.3	-2.4
Cameroon	-3.7	-3.9	-5.2	-3.9	-1.5	-2.2	-2.3	-2.0	-0.4	0.3	0.4	0.7	0.3	0.0	0.0
Chad	-3.6	-2.7	0.1	1.3	3.0	0.8	2.7	-0.8	6.6	9.9	2.1	3.2	2.5	3.3	2.6
Congo, Democratic Republic of the	0.3	-0.1	-0.2	1.6	-0.7	-2.2	-3.0	-1.7	-0.4	-1.7	-1.7	-2.2	-1.5	-2.2	-1.3
Congo, Republic of	-10.6	-17.2	-12.7	-4.0	7.0	7.2	0.1	3.7	11.5	6.6	7.4	6.1	5.4	5.9	6.2
Côte d'Ivoire	-0.7	-0.9	-1.7	-2.0	-1.6	-0.8	-3.6	-3.0	-4.6	-3.0	-1.9	-0.8	-0.8	-0.6	-0.7
Ethiopia	-2.2	-1.5	-1.8	-2.8	-2.5	-2.0	-2.4	-2.2	-3.5	-2.1	-1.4	-1.7	-1.8	-1.6	-1.5
Ghana	-3.3	0.9	-1.5	1.2	-1.4	-2.0	-11.2	-4.8	-3.7	-0.5	0.5	1.5	1.5	1.5	1.5
Guinea	-2.2	-5.7	0.9	-1.2	-0.3	0.2	-2.4	-1.2	0.1	-1.6	-1.5	-1.4	-1.5	-1.6	-1.2
Haiti	-3.4	-1.4	0.3	-0.2	-0.9	-1.7	-2.2	-2.2	-1.7	-1.2	-1.6	-1.6	-1.7	-1.7	-1.8
Honduras	-2.6	0.0	0.2	0.2	0.8	0.8	-3.6	-2.1	2.6	-0.7	-0.4	-0.2	-0.1	0.1	0.1
Kenya	-3.4	-4.2	-4.6	-4.2	-3.4	-3.8	-4.2	-3.1	-1.4	-0.1	0.6	0.8	0.9	0.8	0.8
Kyrgyz Republic	-2.3	-1.7	-4.9	-2.9	0.4	0.8	-2.1	0.0	0.8	-0.8	-2.2	-1.7	-1.5	-1.5	-1.5
Lao P.D.R.	-2.4	-4.8	-4.0	-4.7	-3.5	-2.0	-4.1	-0.3	0.0	0.3	0.3	0.2	0.2	0.1	0.0
Madagascar	-1.5	-2.2	-0.4	-1.4	-0.6	-0.7	-3.2	-2.0	-5.9	-2.9	-2.5	-4.2	-3.3	-3.8	-3.4
Malawi	0.0	-1.9	-1.8	-2.4	-1.6	-1.5	-5.0	-4.6	-4.6	-2.2	-0.9	0.7	2.7	2.5	3.0
Mali	-2.3	-1.2	-3.3	-2.0	-3.9	-0.7	-4.2	-3.5	-3.3	-3.3	-2.9	-2.2	-1.5	-1.5	-1.4
Moldova	-1.1	-1.2	-0.4	0.5	0.0	-0.7	-4.5	-1.8	-2.2	-4.2	-3.4	-2.6	-2.3	-2.0	-1.5
Mozambique	-8.9	-5.5	-2.7	1.0	-1.2	5.0	-2.3	-0.9	-2.1	0.4	0.8	1.7	1.8	2.8	3.9
Myanmar	-0.1	-1.6	-2.6	-1.5	-1.6	-2.4	-4.0	-8.9	-2.5	-1.9	-2.0	-2.1	-1.6	-1.1	-0.9
Nepal	1.8	0.9	1.5	-2.4	-5.4	-4.5	-4.7	-3.2	-2.3	-4.6	-3.3	-2.7	-2.2	-1.6	-1.2
Nicaragua	-0.9	-1.1	-1.2	-0.7	-1.9	1.0	-1.1	0.0	2.1	1.8	1.6	1.5	1.5	1.5	1.4
Niger	-5.8	-6.3	-3.8	-3.4	-2.1	-2.6	-3.8	-4.8	-5.5	-3.6	-2.8	-1.7	-1.8	-1.8	-1.8
Nigeria	-1.5	-2.7	-3.4	-4.1	-2.6	-3.0	-3.5	-3.6	-2.8	-2.7	-1.5	-1.5	-1.7	-1.9	-2.0
Papua New Guinea	-4.6	-2.8	-2.8	-0.4	-0.2	-1.9	-6.2	-4.4	-3.0	-2.2	-1.0	0.3	1.4	2.6	1.7
Rwanda	-3.1	-1.8	-1.3	-1.5	-1.4	-3.8	-7.9	-5.2	-3.9	-2.3	-4.6	-1.4	-0.8	-0.9	-2.1
Senegal	-2.6	-2.1	-1.6	-1.1	-1.7	-1.9	-4.4	-4.3	-4.4	-2.3	-1.3	-1.1	-0.3	-0.2	-0.8
Sudan	-3.9	-3.2	-3.5	-5.6	-7.7	-10.6	-5.9	-0.2	-2.3	-4.1	-2.2	-0.9	-1.0	0.0	0.4
Tajikistan	1.4	-1.5	-8.3	-5.2	-1.6	-1.2	-3.4	0.2	0.5	-1.7	-1.4	-1.3	-1.3	-1.3	-1.4
Tanzania	-1.6	-1.7	-0.6	0.4	-0.2	-0.3	-0.9	-1.8	-1.9	-1.3	-0.6	-0.5	-0.5	-0.5	-0.5
Uganda	-1.5	-1.1	-0.6	-1.5	-1.2	-2.7	-5.2	-4.6	-2.8	-1.1	0.2	0.4	0.7	1.9	3.7
Uzbekistan	1.8	-0.4	0.6	0.9	1.6	-0.5	-3.4	-4.8	-4.3	-4.5	-3.7	-3.1	-2.6	-2.5	-2.5
Vietnam	-3.7	-3.4	-1.6	-0.4	0.5	1.0	-1.5	-0.2	1.3	-0.4	-0.8	-1.2	-1.2	-1.1	-1.0
Yemen	1.5	-2.6	-3.2	-4.7	-7.8	-5.7	-2.6	0.2	-1.6	-1.9	0.7	-0.3	0.0	0.0	0.3
Zambia	-3.2	-6.0	-2.2	-3.5	-3.5	-2.5	-7.8	-2.0	-1.6	0.2	1.3	1.9	1.1	1.9	2.2
Zimbabwe	-0.4	-0.9	-6.0	-9.7	-4.4	-0.5	0.9	-1.7	-1.9	-3.3	-2.4	-2.0	-1.5	-1.4	-1.4

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: "Primary balance" is defined as the overall balance, excluding net interest payments. For country-specific details, see "Data and Conventions" in text and Table D.

Table A22. Low-Income Developing Countries: General Government Net Debt, 2014–28
(Percent of GDP)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Average
Oil Producers
Asia
Latin America
Sub-Saharan Africa
Others
Afghanistan
Bangladesh
Benin
Burkina Faso
Cambodia
Cameroon	19.1	27.6	30.5	33.3	35.9	39.5	43.0	45.4	43.9	40.1	37.0	33.8	31.7	30.2	28.9
Chad
Congo, Democratic Republic of the
Congo, Republic of
Côte d'Ivoire
Ethiopia
Ghana ¹	45.3	49.8	50.9	51.9	60.7	58.3	72.3	79.2	92.4	84.9	81.5	78.8	75.8	72.8	70.0
Guinea
Haiti
Honduras
Kenya	34.8	39.7	47.5	48.1	50.8	54.1	63.0	64.2	65.3	67.5	65.9	64.5	63.0	62.0	61.0
Kyrgyz Republic
Lao P.D.R.
Madagascar
Malawi
Mali	19.7	23.1	30.0	31.1	34.1	34.6	40.4	43.4	47.7	46.8	47.0	47.5	47.7	48.1	48.4
Moldova
Mozambique
Myanmar
Nepal
Nicaragua
Niger	17.2	25.9	29.5	32.3	34.1	35.9	41.0	45.1	45.2	46.2	44.7	44.1	43.8	43.6	43.4
Nigeria ²	13.8	15.9	19.0	20.9	23.5	25.5	34.1	36.4	39.4	38.6	41.1	40.2	40.0	39.9	40.2
Papua New Guinea
Rwanda
Senegal
Sudan
Tajikistan
Tanzania
Uganda
Uzbekistan
Vietnam
Yemen	48.0	56.2	73.3	81.6	85.8	90.9	85.8	72.1	64.3	64.8	54.9	44.5	37.1	32.1	27.8
Zambia
Zimbabwe

Source: IMF staff estimates and projections. Projections are based on staff assessments of current policies (see "Fiscal Policy Assumptions" in text).

Note: For country-specific details, see "Data and Conventions" in text and Table D.

¹ Ghana is in the process of restructuring its debt. Government debt projections are based on a pre-debt restructuring scenario.

² Debt includes overdrafts from the Central Bank of Nigeria and liabilities of the Asset Management Corporation of Nigeria. The overdrafts and government deposits at the Central Bank of Nigeria almost cancel each other out, and the Asset Management Corporation of Nigeria debt is roughly halved.

Table A23. Advanced Economies: Structural Fiscal Indicators
(Percent of GDP, except when indicated otherwise)

	Pension Spending Change, 2022-30 ^{1,9}	Net Present Value of Pension Spending Change, 2022-50 ^{2,9}	Health Care Spending Change, 2022-30 ^{3a,3b}	Net Present Value of Health Care Spending Change, 2022-50 ²	Gross Financing Need, 2023 ⁴	Average Term to Maturity, 2023 (years) ⁵	Debt to Average Maturity, 2023 ⁶	Projected Interest Rate-Growth Differential, 2023-28 (percent)	Prepandemic Overall Balance, 2012-19	Projected Overall Balance, 2023-28	Nonresident Holding of General Government Debt, 2022 (percent of total) ⁷	Net Financial Worth of General Government, 2021 (percent of GDP) ¹⁰
Average	0.6	17.3	2.3	94.3	20.0	7.3	16.7	-1.4	-3.2	-4.2	29.3	
G7	0.6	16.2	2.6	105.6	24.0	7.0	19.0	-1.3	-3.9	-5.4	27.4	
G20 Advanced	0.6	16.8	2.6	103.0	22.5	7.1	18.2	-1.3	-3.7	-5.1	27.6	
Andorra	2.2	84.2	...	...	-3.3	7.5	5.0	...	2.2	3.5	...	...
Australia	-0.1	-3.4	1.4	55.8	2.5	6.9	7.6	-0.4	-2.7	-1.6	31.9	-41.2
Austria	1.1	24.7	1.2	53.4	6.3	12.1	6.2	-2.4	-1.2	-1.8	59.3	-55.6
Belgium	1.3	41.1	1.5	68.5	16.3	10.4	10.2	-1.4	-2.4	-5.1	51.3	-90.6
Canada	0.7	15.7	1.1	45.1	9.3	5.9	17.9	-0.5	-0.5	-0.5	19.6	-37.1
Croatia	0.4	1.1	1.1	48.2	7.6	5.4	11.9	-3.4	-2.2	-1.0	41.2	-43.4
Cyprus	0.7	18.5	...	...	8.1	8.3	9.4	-3.8	-1.4	1.4	81.1	-55.1
Czech Republic	0.4	28.3	0.6	25.4	7.7	2.9	15.6	-2.2	-0.6	-2.2	...	-13.1
Denmark	-0.5	-18.8	1.3	47.2	0.7	8.6	3.5	0.3	0.2	0.6	22.0	-18.3
Estonia	-0.5	-19.1	0.5	23.9	...	7.2	3.0	-3.5	-0.5	-3.0	95.9	14.2
Finland	0.4	-2.6	1.1	39.2	8.8	7.4	9.9	-1.5	-1.8	-2.1	46.4	-30.6
France	0.5	2.4	1.2	49.4	10.6	8.4	13.2	-1.8	-3.6	-4.0	45.8	-146.7
Germany	0.9	26.7	0.7	38.8	6.5	6.6	10.0	-2.5	0.9	-1.2	38.7	-70.0
Hong Kong SAR	1.2	47.9	...	...	...	...	...	...	2.5	-0.3	...	...
Iceland	1.2	46.4	1.2	55.0	4.7	4.5	4.5	0.2	1.1	-0.8	11.3	-35.1
Ireland	0.9	35.2	0.4	21.2	-1.7	10.9	3.9	-3.7	-2.6	1.5	53.0	-40.1
Israel	0.2	12.2	0.3	14.3	...	6.9	8.5	-1.7	-2.8	-2.8	17.5	...
Italy	1.5	33.5	0.5	27.2	23.0	20.9	20.9	-2.5	-2.5	-3.4	25.9	-226.0
Japan	-0.6	8.0	1.1	39.8	34.1	8.3	30.8	-2.6	-4.7	-3.5	13.9	-161.3
Korea	1.1	50.6	1.8	78.6	3.0	10.4	5.2	-2.4	1.3	-0.4	...	-11.7
Latvia	-0.2	-9.9	0.7	29.5	...	7.5	5.4	-4.5	-0.7	-1.9	...	-20.5
Lithuania	0.6	17.5	1.0	46.6	4.4	8.6	4.2	-3.6	-0.6	-1.2	61.7	-17.2
Luxembourg	1.6	62.3	0.7	35.2	...	8.4	3.3	-3.3	1.6	-1.4	45.0	51.1
Malta	-0.5	-4.7	...	...	10.0	7.8	7.0	-2.6	-0.2	-3.2	15.0	-39.5
The Netherlands	1.0	34.3	1.6	62.7	3.9	9.0	5.5	-2.0	-0.8	-2.2	39.4	-33.3
New Zealand	1.1	35.5	1.3	54.6	4.0	7.2	6.4	0.1	-0.3	-1.8	28.0	...
Norway	1.0	25.1	1.4	55.9	...	4.5	8.2	-1.1	7.8	12.6	62.6	278.2
Portugal	1.2	20.8	1.0	43.5	4.8	7.3	14.9	-1.8	-3.5	-0.2	45.2	-105.7
Singapore ⁸	0.8	30.5	...	...	5.4	3.3	50.8	...	4.6	3.0	...	...
Slovak Republic	1.1	49.5	0.4	18.9	6.8	8.7	6.6	-3.9	-2.3	-4.5	44.1	-51.9
Slovenia	0.8	59.6	0.7	35.3	4.2	9.7	7.1	-4.2	-3.4	-2.3	48.8	-32.6
Spain	-0.2	4.6	1.2	51.9	7.7	7.9	13.5	-1.9	-5.4	-3.4	39.9	-101.2
Sweden	-0.3	-10.7	0.5	21.7	2.9	5.7	5.7	-2.9	0.0	0.1	14.4	26.6
Switzerland	0.4	13.4	2.0	84.6	1.8	10.8	3.7	-2.1	0.5	0.2	7.9	20.6
United Kingdom	0.2	11.1	1.6	64.6	8.3	14.1	7.4	-1.6	-4.2	-3.8	25.8	-139.7
United States	0.7	16.7	3.8	150.3	29.9	5.9	20.7	-1.0	-5.1	-7.3	26.6	-121.7

Sources: Bloomberg Finance L.P.; Joint External Debt Hub, Quarterly External Debt Statistics; national authorities; and IMF staff estimates and projections.

Note: All economy averages are weighted by nominal GDP converted to US dollars at average market exchange rates in the years indicated and on the basis of data availability.

¹ Pension projections rely on authorities' estimates when these are available. When authorities' estimates are not available, IMF staff projections use the method described in Clements, Eich, and Gupta, *Equitable and Sustainable Pensions: Challenges and Experience* (IMF 2014). These pension spending projections may be different from the previous edition of the *Fiscal Monitor* because of new baseline pension numbers, new authorities' projections, or updated demographic data from the UN World Population Prospects.

² For net present value calculations, a discount rate of 1 percent a year in excess of GDP growth is used for each economy.

^{3a} IMF staff projections for health care spending are driven by demographics and other factors. The difference between the growth of health care spending and real GDP growth that is not explained by demographics ("excess cost growth") is assumed to start at the economy-specific historical average and converge to the advanced economy historical average by 2050 (0.6 percent).

^{3b} These health expenditure projections have been updated to include new available underlying health and economic data as well as technical adjustments to the excess cost growth calculation and the age-expenditure profiles. The projections exclude health expenditure growth during the COVID-19 pandemic in the underlying trend expenditure growth estimate.

⁴ "Gross financing need" is defined as the projected overall deficit and maturing government debt in 2023. For most economies, data on maturing debt refer to central government securities. Data are from Bloomberg Finance L.P. and IMF staff projections.

⁵ For most economies, the average-term-to-maturity data refer to central government securities and are determined by calculating the maturity across government securities, with their respective amounts serving as weights; the source is Bloomberg Finance L.P.

⁶ The debt-to-average-maturity data are calculated by dividing government securities with the average term to maturity to quantify the average annual debt repayment obligation.

⁷ Nonresident holding of general government debt data are for the fourth quarter of 2022 or latest available from the Joint External Debt Hub, Quarterly External Debt Statistics, which include marketable and nonmarketable debt. For some economies, tradable instruments in the Joint External Debt Hub are reported at market value. External debt in US dollars is converted to local currency and then taken as a percentage of the 2022 gross general government debt.

⁸ Singapore's general government debt is covered by financial assets and is mainly issued to deepen the domestic market, meet the Central Provident Fund's investment needs, provide individuals with a long-term savings option, and facilitate the transfer of official reserves not needed by the central bank to the government.

⁹ In the case of all EU members, including Slovakia, pension spending projections reflect the estimates published in the latest available Aging Report. Reforms and changes in methodology or assumptions between Aging Report vintages are not incorporated into the *Fiscal Monitor* annexes.

¹⁰ Net financial worth of general government data are for 2021 or latest available from the Public Sector Balance Sheet (PSBS) Database.

Table A24. Emerging Market and Middle-Income Economies: Structural Fiscal Indicators
(Percent of GDP, except when indicated otherwise)

	Pension Spending Change, 2022-30 ¹	Net Present Value of Pension Spending Change, 2022-50 ²	Health Care Spending Change, 2022-30 ^{3a,b}	Net Present Value of Health Care Spending Change, 2022-50 ²	Gross Financing Need, 2023 ⁴	Average Term to Maturity, 2023 (years) ⁵	Debt to Average Maturity, 2023	Projected Interest Rate-Growth Differential, 2023-28 (percent)	Prepandemic Overall Balance, 2012-19	Projected Overall Balance, 2023-28	Nonresident Holding of General Government Debt, 2022 (percent of total) ⁶	Net Financial Worth of General Government, 2021 (percent of GDP) ¹⁰
Average	1.4	70.9	0.6	28.9	12.2	7.7	9.8	-2.9	-3.2	-5.4	12.9	
G20 Emerging	1.4	73.8	0.6	28.9	11.8	7.9	9.6	-2.7	-3.4	-6.2	9.0	
Algeria	3.0	142.2	0.6	29.4	...	6.8	8.1	-4.0	-8.4	-9.7	1.0	
Angola	0.1	2.3	0.1	5.9	...	6.8	12.5	-6.4	-1.6	0.8	...	
Argentina	0.7	46.2	1.0	46.5	16.0	7.1	12.6	...	-5.0	...	...
Belarus	2.7	96.6	0.7	32.0	...	...	...	-2.6	-0.3	1.1	61.5	
Brazil ⁷	0.2	30.4	0.9	41.1	19.1	5.6	15.8	2.8	-5.9	-5.4	10.4	-151.4
Bulgaria	0.0	5.4	0.9	41.5	...	7.4	2.8	-3.3	-0.9	-3.0	48.5	-5.3
Chile	1.0	44.1	1.2	55.5	3.6	9.8	3.9	-2.3	-1.6	-0.6	36.0	
China	1.8	95.0	0.7	31.1	...	7.4	11.2	-3.6	-2.7	-7.4	3.2	
Colombia	2.0	91.4	1.7	79.9	...	10.6	5.2	0.1	-2.4	-2.5	35.3	-52.5
Dominican Republic	0.1	2.5	0.6	27.3	5.4	8.5	7.0	-2.5	-3.2	-2.7	53.6	
Ecuador	0.7	35.4	0.9	41.6	6.5	11.4	4.9	0.9	-6.0	-0.6	72.6	
Egypt	1.1	56.7	0.2	9.0	32.2	3.3	28.3	-6.5	-10.1	-8.9	...	
Hungary	-0.1	21.7	1.0	42.7	15.5	5.8	11.9	-2.1	-2.3	-3.0	31.1	-55.9
India	0.7	33.3	0.2	8.9	13.0	10.9	7.5	-3.0	-7.0	-7.9	4.7	
Indonesia	0.1	6.7	0.3	14.9	4.0	8.3	4.7	-1.5	-2.2	-2.1	35.2	-12.9
Iran	1.2	86.5	0.5	23.2	...	...	...	-13.8	-1.7	-6.2	...	
Kazakhstan	1.2	33.0	0.3	14.2	...	5.5	4.2	-2.6	-0.1	-1.2	25.2	49.5
Kuwait	8.5	629.0	1.3	60.7	10.5	1.2	2.9	4.8	12.9	7.2	...	
Lebanon	...	...	...	...	...	...	...	...	-8.8	...	...
Malaysia	1.4	66.3	0.4	16.7	...	8.8	7.6	-1.9	-2.7	-4.4	21.9	
Mexico	0.8	44.7	0.6	28.1	12.3	8.2	6.4	2.9	-2.9	-3.3	25.0	-74.0
Morocco	1.3	54.6	0.4	19.3	13.7	6.3	11.0	-1.8	-4.4	-3.8	23.7	
Oman	0.2	16.4	0.6	33.1	8.6	7.1	5.4	5.7	-6.2	4.2	...	
Pakistan	0.2	6.3	0.1	5.3	23.7	2.3	33.8	-6.1	-5.9	-6.2	29.5	
Peru	...	...	0.7	33.4	4.1	13.6	2.5	-1.3	-1.0	-1.0	41.1	-22.2
Philippines	0.2	7.3	0.3	13.1	12.6	6.3	9.1	-4.1	-0.4	-3.6	25.7	
Poland	-0.1	-5.5	0.8	33.8	9.7	4.9	10.3	-3.7	-2.4	-4.7	28.9	-37.5
Qatar	0.3	24.3	0.5	23.8	8.6	8.8	4.7	-0.6	9.0	9.5	8.6	
Romania	2.3	74.1	...	...	12.8	7.1	7.1	-3.7	-2.6	-5.8	40.4	-31.6
Russian Federation	2.2	72.4	1.0	46.1	4.6	7.5	2.8	-0.1	-0.7	-1.3	10.9	17.3
Saudi Arabia	2.8	161.2	0.8	36.2	11.6	10.1	2.4	2.1	-4.2	0.5	33.5	
South Africa	0.2	11.7	0.7	34.7	15.4	11.2	6.6	2.5	-4.1	-6.6	26.2	1.4
Sri Lanka	...	...	...	...	...	...	...	...	-5.7	...	31.8	
Thailand	3.3	113.7	0.6	26.3	10.0	7.9	7.8	-2.0	-0.2	-2.7	11.3	
Türkiye ⁸	0.7	46.9	...	...	...	5.5	...	...	...	...	...	-18.3
Ukraine	...	...	...	...	26.0	6.8	13.0	-8.4	-3.0	-9.6	51.9	-32.1
United Arab Emirates	0.4	42.8	0.5	25.4	...	3.4	8.6	-2.0	1.9	3.9	...	
Uruguay ⁹	0.6	40.5	1.2	55.3	6.5	11.9	5.2	-3.7	-2.3	-2.4	47.9	-52.3
Venezuela	...	...	...	...	...	...	...	...	-12.5	-5.1	...	

Sources: Joint External Debt Hub, Quarterly External Debt Statistics; national authorities; and IMF staff estimates and projections.

Note: All country averages are weighted by nominal GDP converted to US dollars at average market exchange rates in the years indicated and on the basis of data availability.

¹Pension projections rely on authorities' estimates when these are available. When authorities' estimates are not available, IMF staff projections use the method described in Clements, Eich, and Gupta, *Equitable and Sustainable Pensions: Challenges and Expectance* (IMF 2014). These pension spending projections may be different from the previous edition of the *Fiscal Monitor* because of new baseline pension numbers, new authorities' projections, or updated demographic data from the UN World Population Prospects.

²For net present value calculations, a discount rate of 1 percent in excess of GDP growth is used for each economy.

^{3a}IMF staff projections for health care spending are driven by demographics and other factors. The difference between the growth of health care spending and real GDP growth that is not explained by demographics ("excess cost growth") is assumed to be the income group historical average (1.2 percent).

^{3b}These health expenditure projections have been updated to include new available underlying health and economic data as well as technical adjustments to the excess cost growth calculation and the age-expenditure profiles. The projections exclude health expenditure growth during the COVID-19 pandemic in the underlying trend expenditure growth estimate.

⁴"Gross financing need" is defined as the projected overall balance and maturing government debt in 2023. Data are from Bloomberg Finance L.P. and IMF staff projections.

⁵Average-term-to-maturity data refer to government securities; the source is Bloomberg Finance L.P.

⁶Nonresident holding of general government debt data are for the fourth quarter of 2022 or latest available from the Joint External Debt Hub, Quarterly External Debt Statistics, which include marketable and nonmarketable debt. For some countries, tradable instruments in the Joint External Debt Hub are reported at market value. External debt in US dollars is converted to local currency and then taken as a percentage of 2022 gross general government debt.

⁷Note that the pension spending projections reported in the first and second column do not include savings from the pension reform approved in October 2019.

⁸The average-term-to-maturity data for Türkiye are in accordance with the published data for central government debt securities as of July 2022.

⁹Data are for the nonfinancial public sector, which includes central government, local government, social security funds, nonfinancial public corporations, and Banco de Seguros del Estado. The coverage of fiscal data was changed from the consolidated public sector to the nonfinancial public sector with the October 2019 submission. With this narrower coverage, the central bank balances are not included in the fiscal data. Historical data were also revised accordingly.

¹⁰Net financial worth of general government data are for 2021 or latest available from the Public Sector Balance Sheet (PSBS) Database.

Table A25. Low-Income Developing Countries: Structural Fiscal Indicators
(Percent of GDP, except when indicated otherwise)

	Pension Spending Change, 2022–30 ¹	Net Present Value of Pension Spending Change, 2022–50 ²	Health Care Spending Change, 2022–30 ^{3a,b}	Net Present Value of Health Care Spending Change, 2022–50 ²	Average Term to Maturity, 2023 (years) ⁴	Debt to Average Maturity, 2023	Projected Interest Rate-Differential, 2023–28 (percent)	Prepandemic Overall Balance, 2012–19	Projected Overall Balance, 2023–28	Nonresident Holding of General Government Debt, 2022 (percent of total) ⁵	Net Financial Worth of General Government, 2021 (percent of GDP) ⁶
Average	0.5	20.0	0.2	8.3	7.5	9.9	-7.3	-3.3	-3.3	48.5	...
Afghanistan	...	...	...	...	...	...	...	-0.4	...	...	...
Bangladesh	0.2	12.5	0.1	3.0	4.6	8.6	-6.3	-3.5	-4.7	34.9	...
Benin	0.0	1.2	0.1	4.5	7.7	6.9	-4.9	-2.6	-3.3	...	...
Burkina Faso	0.0	2.2	0.4	16.4	3.2	18.9	-3.0	-3.5	-4.5	43.9	...
Cambodia	0.4	14.1	0.3	12.3	...	...	-7.5	-0.9	-3.1	99.5	...
Cameroon	0.0	3.2	0.1	3.3	4.3	9.8	-3.5	-0.7	-3.7	65.8	...
Chad	0.0	0.7	0.1	4.7	...	...	-1.3	-1.3	2.7	...	...
Congo, Democratic Republic of the	...	...	0.1	3.3	...	...	-8.9	0.0	-2.1	...	...
Congo, Republic of	0.2	8.9	0.2	10.6	...	...	-1.4	-4.3	3.8	...	...
Côte d'Ivoire	0.1	6.8	0.1	6.2	...	...	-3.8	-2.4	-3.5	...	...
Ethiopia	0.0	1.8	0.1	5.8	...	...	...	-2.3	-2.7	...	...
Ghana ⁷	0.2	8.1	0.3	13.3	7.2	11.9	-10.6	-6.8	-3.5	...	...
Guinea	0.0	0.0	0.1	5.3	...	...	-9.0	0.8	-2.4	...	...
Haiti	...	...	0.1	2.6	...	...	-15.3	-1.9	-1.8	...	...
Honduras	0.3	20.2	0.5	21.3	3.5	13.2	-2.4	-1.7	-1.4	...	...
Kenya	0.2	12.8	0.3	13.5	8.3	8.5	-3.2	-6.5	-3.9	47.5	...
Kyrgyz Republic	4.0	114.3	0.3	13.5	...	...	-6.6	-3.2	-3.1	78.0	-30.0
Lao P.D.R.	0.1	6.9	0.2	6.9	...	...	-5.8	-4.2	-3.3	...	...
Madagascar	0.2	10.8	0.2	7.9	...	...	-9.0	-2.1	-4.2	47.9	...
Malawi	-0.1	0.4	0.2	11.2	2.7	25.7	-5.1	-3.9	-5.8	43.0	...
Mali	-0.1	-0.6	0.2	7.6	2.9	17.7	-3.9	-2.7	-3.7	...	...
Moldova	3.0	67.1	0.7	31.7	...	...	-6.4	-1.4	-3.9	66.9	-9.5
Mozambique	0.0	4.3	0.3	14.2	3.1	29.0	-10.0	-4.2	-0.6	...	...
Myanmar	0.2	9.6	...	...	...	...	-6.6	-2.8	-4.2	...	...
Nepal	0.1	9.7	0.2	10.3	...	...	-6.2	-1.3	-4.2	...	...
Nicaragua	0.6	38.3	0.7	33.9	0.6	68.2	-5.1	-1.3	0.5	90.9	...
Niger	0.0	0.6	0.3	11.6	...	...	-5.5	-3.8	-3.5	...	...
Nigeria	0.0	0.8	0.1	3.0	10.1	3.8	-6.7	-3.5	-4.9	...	...
Papua New Guinea	0.1	4.5	0.2	10.5	...	...	0.0	-4.1	-2.1	...	...
Rwanda	0.0	1.3	0.4	17.4	7.1	8.9	-8.5	-2.8	-4.4	75.6	...
Senegal	0.0	...	0.2	10.7	7.6	10.7	-5.2	-3.7	-3.4	...	...
Sudan	0.0	1.2	0.2	7.0	...	...	-43.9	-6.3	-1.9	...	...
Tajikistan	0.4	13.4	0.3	12.5	...	...	-6.6	-2.6	-2.5	90.3	...
Tanzania	0.0	3.8	0.2	8.4	10.7	4.0	-5.4	-2.6	-2.7	...	...
Uganda	0.1	3.7	0.1	3.8	...	...	-4.1	-3.1	-1.9	57.3	-30.6
Uzbekistan	2.3	82.9	0.4	17.1	...	...	-12.1	1.6	-3.4	61.9	...
Vietnam	1.5	64.2	0.3	14.6	10.1	3.3	-6.1	-3.5	-1.9	...	...
Yemen	0.1	8.8	0.1	2.7	...	...	-14.4	-6.7	-0.8	...	...
Zambia	0.0	10.1	0.3	13.7	3.8	25.6	-5.7	-6.8	-3.6	...	...
Zimbabwe	-0.3	-1.8	0.1	4.4	3.1	30.3	-53.3	-3.5	-2.7	...	...

Sources: Joint External Debt Hub, Quarterly External Debt Statistics; national authorities; and IMF staff estimates and projections.

Note: All country averages are weighted by nominal GDP converted to US dollars at average market exchange rates in the years indicated and on the basis of data availability.

¹ Pension projections rely on authorities' estimates when these are available. When authorities' estimates are not available, IMF staff projections use the method described in Clements, Eich, and Gupta, *Equitable and Sustainable Pensions: Challenges and Experience* (IMF 2014). These pension spending projections may be different from the previous edition of the *Fiscal Monitor* because of new baseline pension numbers, new authorities' projections, or updated demographic data from the UN World Population Prospects.

² For net present value calculations, a discount rate of 1 percent a year in excess of GDP growth is used for each economy.

^{3a} IMF staff projections for health care spending are driven by demographics and other factors. The difference between the growth of health care spending and real GDP growth that is not explained by demographics ("excess cost growth") is assumed to be the income group historical average (1.2 percent).

^{3b} These health expenditure projections have been updated to include new available underlying health and economic data as well as technical adjustments to the excess cost growth calculation and the age-expenditure profiles. The projections exclude health expenditure growth during the COVID-19 pandemic in the underlying trend expenditure growth estimate.

⁴ The average-term-to-maturity data refer to government securities and may not take all the external official debt into account; the source is Bloomberg Finance L.P.

⁵ Nonresident holding of general government debt data are for the fourth quarter of 2022 or latest available from the Joint External Debt Hub, Quarterly External Debt Statistics, which include marketable and nonmarketable debt. For some countries, tradable instruments in the Joint External Debt Hub are reported at market value. External debt in US dollars is converted to local currency and then taken as a percentage of 2022 gross government debt.

⁶ Net financial worth of general government data are for 2021 or latest available from the Public Sector Balance Sheet (PSBS) Database.

⁷ Ghana is in the process of restructuring its debt. Government debt and interest rate projections are based on a pre-debt restructuring scenario.

SELECTED TOPICS

Fiscal Monitor Archives

Climate Crossroads: Fiscal Policies in a Warming World	October 2023
On the Path to Policy Normalization	April 2023
Helping People Bounce Back	October 2022
Fiscal Policy from Pandemic to War	April 2022
Strengthening the Credibility of Public Finances	October 2021
A Fair Shot	April 2021
Policies for the Recovery	October 2020
Policies to Support People During the COVID-19 Pandemic	April 2020
How to Mitigate Climate Change	October 2019
Curbing Corruption	April 2019
Managing Public Wealth	October 2018
Capitalizing on Good Times	April 2018
Tackling Inequality	October 2017
Achieving More with Less	April 2017
Debt: Use It Wisely	October 2016
Acting Now, Acting Together	April 2016
The Commodities Roller Coaster: A Fiscal Framework for Uncertain Times	October 2015
Now Is the Time: Fiscal Policies for Sustainable Growth	April 2015
Back to Work: How Fiscal Policy Can Help	October 2014
Public Expenditure Reform: Making Difficult Choices	April 2014
Taxing Times	October 2013
Fiscal Adjustment in an Uncertain World	April 2013
Taking Stock: A Progress Report on Fiscal Adjustment	October 2012
Balancing Fiscal Policy Risks	April 2012
Addressing Fiscal Challenges to Reduce Economic Risks	September 2011
Shifting Gears	April 2011
Fiscal Exit: From Strategy to Implementation	November 2010
Navigating the Fiscal Challenges Ahead	May 2010

I. Adjustment

Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Capitalizing on Good Times	April 2018
Defining and Measuring Fiscal Space	April 2017, Annex 1.1
China: What Do We Know about the General Government's Balance Sheet?	October 2016, Box 1.1
Brazil: Private Debt and the Strength of the Public Sector Balance Sheet	October 2016, Box 1.3
Fiscal Consolidations with Progressive Measures	April 2014, Box 2.4
Constructing an Index of the Difficulty of Fiscal Adjustment	October 2013, Box 1
Medium-Term Fiscal Adjustment in an Uncertain World	April 2013, Chapter 2
The Appropriate Pace of Short-Term Fiscal Adjustment	April 2013, Box 2
Fiscal Adjustment in the United States: Making Sense of the Numbers	April 2013, Box 5
Taking Stock: A Progress Report on Fiscal Adjustment	October 2012, Chapter 2
Distributional Consequences of Alternative Fiscal Consolidation Measures: Reading from the Data	October 2012, Appendix 1
Easy Does It: The Appropriate Pace of Fiscal Consolidation	April 2012, Chapter 3

Experience with Large Fiscal Adjustment Plans in Ireland and Portugal	April 2012, Box A2.1
Fiscal Multipliers in Expansions and Contractions	April 2012, Appendix 1
Early Lessons from Experiences with Large Fiscal Adjustment Plans	April 2012, Appendix 2
Fiscal Adjustment Plans and Medium-Term Fiscal Outlook	November 2010, Chapter 3
To Tighten or Not to Tighten: This Is the Question	November 2010, Box 1.2
Fiscal Adjustment and Income Distribution in Advanced and Emerging Economies	November 2010, Appendix 3
The Fiscal Policy Outlook: Adjustment Needs and Plans	May 2010, Chapter 3
Adjustment Measures and Institutions	May 2010, Chapter 4
Fiscal Adjustment Requirements: Gross and Net Debt Targets	May 2010, Appendix 2

II. Climate Change

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
GDP Impact of Climate Mitigation Policies	October 2023, Box 1.1
How to Mitigate Climate Change	October 2019, Chapter 1

III. Commodities and Energy

The Energy Transition of Fossil Fuel-Exporting Countries	October 2023, Box 1.2
How Have Firms Responded to Recent Energy Price Shocks?	October 2023, Box 1.3
On the Path to Policy Normalization	April 2023, Chapter 1
Helping People Bounce Back	October 2022, Chapter 1
Externalities from Energy Pricing Subsidies	October 2022, Online Annex 1.5
Governance in the Extractive Industries	April 2019, Box 2.1
Bolivia: Inequality Decline during a Commodity Boom	October 2017, Box 1.3
The Fiscal Impact of Lower Oil Prices	April 2015, Chapter 1
Reforming Energy Subsidies	April 2015, Box 1.2
Reforming Energy Subsidies	April 2013, Appendix 1
Fiscal Developments in Oil-Producing Economies	September 2011, Box 3
Fuel and Food Price Shocks and Fiscal Performance in Low-Income Countries	September 2011, Box 8
Pass-Through and Fiscal Impact of Rising Fuel Prices	April 2011, Box 1.2
Reforming Petroleum Subsidies	May 2010, Appendix 5

IV. Country Cases

Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Income Stabilization before and during the COVID-19 Pandemic across EU Countries: A Microsimulation Approach	October 2022, Online Annex 1.2
Brazil's Emergency Cash Transfer Program	October 2022, Online Annex 1.3
Social Protection and Poverty During the Pandemic	April 2022, Box 1.1
Analysis of Poverty, Social Safety Nets, and Informality	April 2022, Online Annex 1.2
Global Spillovers from the Fiscal Packages in the European Union and the United States	October 2021, Online Annex 1.1
Long-Term Distributional Impact of the American Families Plan	October 2021, Box 1.1; Online Annex 1.2
Fiscal Developments in Countries Participating in the Debt Suspension Initiative	October 2021, Box 1.2
Persistent Consequences of Wealth Inequality for the Next Generation's Income: The Case of Norway	April 2021, Box 2.1
A Wave of Protests: Economic Reforms and Social Unrest	April 2020, Box 1.2
Fiscal Measures in Selected Economies in Response to the COVID-19 Pandemic	April 2020, Special Feature Online Annex 1.1
The Macroeconomic Effects of Public Investment: A Model-Based Analysis	April 2020, Online Annex 2.1
China: State-Owned Enterprises Remain Key Players	April 2020, Online Annex 3.1

Brazil: A Complex and, at Times, Turbulent Relationship between SOEs and the Government	April 2020, Online Annex 3.2
Ghana: Risks in SOEs Can Spill Over to Other Sectors and the Budget	April 2020, Online Annex 3.5
How to Get the Most Out of SOEs: The Nordic Example	April 2020, Online Annex 3.7
China: How Can Fiscal Policy Support Economic Activity and Rebalancing?	April 2019, Box 1.2
The Distributional Effects of Income Tax Cuts in the United States	April 2018, Box 1.2
International Tax Policy Implications from US Corporate Tax Reform	April 2018, Box 1.3
General Government Debt and Fiscal Risks in China	April 2018, Box 1.4
Digital Government	April 2018, Chapter 2
Digitalization Advances in Revenue Administration in South Africa and Estonia	April 2018, Box 2.1
The Digitalization of Public Finances: Country Case Studies	April 2018, Annex 2.1
Bolivia: Inequality Decline during a Commodity Boom	October 2017, Box 1.3
Adopting a Universal Basic Income to Support Subsidy Reform in India	October 2017, Box 1.6
Model Simulations	October 2017, Annex 1.3
Making Growth More Inclusive in China	April 2017, Box 1.3
Colombia: Labor Tax Reform and the Shift from Informal to Formal Employment	April 2017, Box 2.2
Mozambique: Differential Tax Treatment across Firms	April 2017, Box 2.3
Innovation in Brazil, Russia, India, China, and South Africa (BRICS)	October 2016, Box 2.4
Lowflation and Debt in the Euro Area	October 2014, Box 1.1
Fiscal Challenges in the Pacific Island Countries	April 2014, Box 1.3
Fiscal Reforms to Unlock Economic Potential in the Arab Countries in Transition	October 2013, Box 2
Fiscal Adjustment in the United States: Making Sense of the Numbers	April 2013, Box 5
Lessons from Sweden	October 2012, Box 2
The “Two-Pack”: Further Reforms to Fiscal Governance in the Euro Area	October 2012, Box 6
Ireland: The Impact of Crisis and Fiscal Policies on Inequality	October 2012, Box 8
The “Fiscal Compact”: Reforming EU Fiscal Governance	April 2012, Box 5
Experience with Large Fiscal Adjustment Plans in Ireland and Portugal	April 2012, Box A2.1
Subnational Government Response to the Financial Crisis in the United States and Canada	April 2012, Box A3.1
The Dog That Didn’t Bark (So Far): Low Interest Rates in the United States and Japan	September 2011, Chapter 3
United States: Government-Sponsored Enterprises and Contingent Liabilities	September 2011, Box 1
Fiscal Aspects of EU Economic Governance Reforms	April 2011, Box 4.1
The U.S. National Commission Report	April 2011, Box A5.1
The European Union: Reforming Fiscal Governance	November 2010, Box 3.2
Increasing Social Expenditures and Household Consumption in China	May 2010, Box 4
Health Care Reforms in the United States	May 2010, Box 5

V. Crises and Shocks

How Have Firms Responded to Recent Energy Price Shocks?	October 2023, Box 1.3
On the Path to Policy Normalization	April 2023, Chapter 1
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Helping People Bounce Back	October 2022, Chapter 1
Countercyclical of Fiscal Policies	October 2022, Annex 1.1
Designing Government Support to Firms during a Crisis	October 2022, Box 1.2
Fiscal Policy from Pandemic to War	April 2022, Chapter 1
Evaluating How Well Scenarios in Debt Sustainability Analyses Capture Key Fiscal Risks	October 2021, Box 2.1
Financing Constraints and the Strategy for Investment	October 2020, Online Annex 2.1
Assessing the Impact of the COVID-19 Crisis on Monthly Investment Budgets	October 2020, Online Annex 2.2
Database of Country Fiscal Measures in Response to the COVID-19 Pandemic	October 2020, Online Only
An Unprecedented Fiscal Response: A Closer Look	October 2020, Box 1.2

Policies to Support People During the COVID-19 Pandemic	April 2020, Chapter 1
Fiscal Measures in Selected Economies in Response to the COVID-19 Pandemic	April 2020, Online Annex 1.1
Fiscal Implications of Potential Stress in Global Financial Markets	April 2019, Box 1.1
Learning from the Crisis? Taxation and Financial Stability	October 2013, Box 3
Ireland: The Impact of Crisis and Fiscal Policies on Inequality	October 2012, Box 8
The Impact of the Global Financial Crisis on Subnational Government Finances	April 2012, Appendix 3
The Evolution of Seigniorage during the Crisis	April 2012, Box 4
Subnational Government Response to the Financial Crisis in the United States and Canada	April 2012, Box A3.1
The Legacy of the Crisis: How Long Will It Take to Lower Public Debt?	September 2011, Chapter 5
The G-20 Economies: Crisis-Related Discretionary Fiscal Stimulus	November 2010, Box 1.1
Update on Crisis-Related Discretionary Fiscal Stimulus in G-20 Economies	May 2010, Appendix 1
The Impact of the Crisis on Subnational Governments	May 2010, Appendix 4

VI. Emerging Markets

The Energy Transition of Fossil Fuel-Exporting Countries	October 2023, Box 1.2
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Brazil Emergency Cash Transfer Program	October 2022, Online Annex 1.3
General Government Debt and Fiscal Risks in China	April 2018, Box 1.4
Digitalization Advances in Revenue Administration in South Africa and Estonia	April 2018, Box 2.1
The Digitalization of Public Finances: Country Case Studies	April 2018, Annex 2.1
Innovation in Brazil, Russia, India, China, and South Africa (BRICS)	October 2016, Box 2.4
Nonresident Holdings of Emerging Market Economy Debt	April 2014, Box 1.2
Potential Sources of Contingent Liabilities in Emerging Market Economies	April 2013, Box 4
Fiscal Fundamentals and Global Spillovers in Emerging Economies	April 2012, Box 2
Too Good to Be True? Fiscal Developments in Emerging Economies	September 2011, Chapter 4
Determinants of Domestic Bond Yields in Emerging Economies	September 2011, Box 4

VII. Employment

Income Stabilization before and during the COVID-19 Pandemic across EU countries: A Microsimulation Approach	October 2022, Online Annex 1.2
The Direct Labor Impact of Public Investment	October 2020, Online Annex 2.4
Colombia: Labor Tax Reform and the Shift from Informal to Formal Employment	April 2017, Box 2.2
Can Fiscal Policies Do More for Jobs?	October 2014, Chapter 2
Methodology for Estimating the Impact of Fiscal Consolidation on Employment	October 2014, Appendix 1
Do Old Workers Crowd Out the Youth?	October 2014, Box 2.2
Fiscal Policies to Address Weak Employment	October 2012, Appendix 2

VIII. Financial Sector

Designing Government Support to Firms during a Crisis	October 2022, Box 1.2
State-Owned Banks	April 2020, Box 3.2
The Fiscal Implications of International Bond Issuance by Low-Income Developing Countries	October 2014, Box 1.2
Nonresident Holdings of Emerging Market Economy Debt	April 2014, Box 1.2
A One-Off Capital Levy?	October 2013, Box 6
Bond Yields and Stability of the Investor Base	April 2013, Box 3
Long-Run and Short-Run Determinants of Sovereign Bond Yields in Advanced Economies	October 2012, Box 3
Financial Sector Support	October 2012, Box 4
Reassuring Markets about Fiscal Sustainability in the Euro Area	September 2011, Chapter 2
Determinants of Domestic Bond Yields in Emerging Economies	September 2011, Box 4

Financial Sector Support and Recovery to Date	September 2011, Box 7
Financial Sector Support and Recovery to Date	April 2011, Box 1.1
Sovereign Financing and Government Debt Markets	November 2010, Chapter 2
Market Concerns about Economies and Default Risks	November 2010, Box 2.1
Advanced Economies: Financial Market Spillovers among Sovereigns	November 2010, Box 2.2
Are Sovereign Spreads Linked to Fundamentals?	November 2010, Appendix 2
Measures to Finance the Cost of Financial Sector Support	May 2010, Box 3

IX. Fiscal Outlook

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
On the Path to Policy Normalization	April 2023, Chapter 1
Helping People Bounce Back	October 2022, Chapter 1
Policy in an Uncertain Recovery	October 2021, Chapter 1
Policies to Support People during the COVID-19 Pandemic	April 2020, Chapter 1
Fiscal Policy for a Changing Global Economy	April 2019, Chapter 1
Saving for a Rainy Day	April 2018, Chapter 1
Recent Fiscal Developments and Outlook	April 2017, Chapter 1
Navigating a Risky World	October 2016, Chapter 1
Recent Fiscal Developments and Outlook	April 2015, Chapter 1
Recent Fiscal Developments and Outlook	October 2014, Chapter 1
Recent Fiscal Developments and Outlook	April 2014, Chapter 1
Recent Fiscal Developments and the Short-Term Outlook	October 2013, Chapter 1
Recent Fiscal Developments and the Short-Term Outlook	April 2013, Chapter 1
The Fiscal Outlook	October 2012, Chapter 1
Moving Forward	October 2012, Chapter 3
Continued Fiscal Tightening Is in Store for 2012, Particularly among Advanced Economies	April 2012, Chapter 1
Conclusion and Risk Assessment	April 2012, Chapter 7
Addressing Fiscal Challenges to Reduce Economic Risks: Introduction	September 2011, Chapter 1
Too Good to Be True? Fiscal Developments in Emerging Economies	September 2011, Chapter 4
Addressing Fiscal Challenges to Reduce Economic Risks: Conclusion	September 2011, Chapter 7
Risk to the Baseline	September 2011, Box 2
Fiscal Developments in Oil-Producing Economies	September 2011, Box 3
The Fiscal Indicators Index	September 2011, Box 5
Shocks to the Baseline Fiscal Outlook	April 2011, Chapter 3
Fiscal Developments and Near-Term Outlook	November 2010, Chapter 1
Fiscal Adjustment Plans and Medium-Term Fiscal Outlook	November 2010, Chapter 3
Assessing Fiscal Risks	November 2010, Chapter 4
The Near- and Medium-Term Fiscal Outlook	May 2010, Chapter 1

X. Government Debt

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
On the Path to Policy Normalization	April 2023, Chapter 1
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Strengthening the Credibility of Public Finances	October 2021, Chapter 2
Capitalizing on Good Times	April 2018
Private Debt and Its Discontents	April 2018, Box 1.1
General Government Debt and Fiscal Risks in China	April 2018, Box 1.4
Can Countries Sustain Higher Levels of Public Debt?	April 2017, Box 1.4

Do Fiscal Rules Lower Sovereign Borrowing Costs in Countries with Weak Track Records of Fiscal Performance?	April 2017, Box 1.5
Debt: Use It Wisely	October 2016, Chapter 1
Debt Data Set	October 2016, Annex 1.1
Private and Public Debt and the Pace of the Recovery	October 2016, Annex 1.2
Interlinkages between Public and Private Debt: Selected Summary of the Literature	October 2016, Annex 1.3
Policies during Deleveraging Episodes	October 2016, Annex 1.5
How Much Do Financial Markets Value Government Balance Sheets?	October 2016, Box 1.5
Skeletons in the Closet? Shedding Light on Contingent Liabilities	April 2016, Box 1.3
Lowflation and Debt in the Euro Area	October 2014, Box 1.1
Moment of Truth: Unfunded Pension Liabilities and Public Debt Statistics	April 2014, Box 1.1
Public Debt Dynamics and Fiscal Adjustment in Low-Income Countries in Sub-Saharan Africa	April 2013, Box 6
Debt Ratios Are Still on the Rise, but Peaks Are within Sight	April 2012, Chapter 2
High Gross Debt Levels May Overstate Challenges in the Short Run . . .	April 2012, Chapter 4
. . . But Long-Run Debt-Related Challenges Remain Large	April 2012, Chapter 5
The Legacy of the Crisis: How Long Will It Take to Lower Public Debt?	September 2011, Chapter 5
Factors Underlying the Debt Increase Precrisis versus End-2015	September 2011, Box 6
The Importance of Monitoring Both Gross and Net Debt	September 2011, Appendix 3
Stock-Flow Adjustments and Their Determinants	September 2011, Appendix 4
Fiscal Deficits and Debts: Development and Outlook	April 2011, Chapter 1
Sovereign Financing and Government Debt Markets	April 2011, Chapter 2
Debt Dynamics and the Interest Rate–Growth Differential	April 2011, Box 3.1
Sovereign Financing and Government Debt Markets	November 2010, Chapter 2
Are Sovereign Spreads Linked to Fundamentals?	November 2010, Appendix 2
Risks to Medium-Term Public Debt Trajectories; Methodological and Statistical Appendix	November 2010, Appendix 4
Implications of Fiscal Developments for Government Debt Markets	May 2010, Chapter 2
Debt Dynamics in G-20 Economies: An Update	May 2010, Box 1
Gross versus Net Debt	May 2010, Box 2
Fiscal Adjustment Requirements: Gross and Net Debt Targets	May 2010, Appendix 2
Government Debt and Growth	May 2010, Appendix 3

XI. Growth

<i>IDEAS</i> to Respond to Weaker Growth	April 2020, Chapter 2
Factors Underlying Low Growth and Low Interest Rates	April 2020, Box 2.1
Fiscal Policy for a Changing Global Economy	April 2019, Chapter 1
China: How Can Fiscal Policy Support Economic Activity and Rebalancing?	April 2019, Box 1.2
Tackling Inequality	October 2017, Chapter 1
A Greater Role for Fiscal Policy	April 2017, Chapter 1
Upgrading the Tax System to Boost Productivity	April 2017, Chapter 2
Making Growth More Inclusive in China	April 2017, Box 1.3
Taxation and Growth: Details Matter	October 2013, Box 4
Debt Dynamics and the Interest Rate–Growth Differential	April 2011, Box 3.1
Interest Rate–Growth Differential	November 2010, Appendix 1
Government Debt and Growth	May 2010, Appendix 3

XII. Inflation

On the Path to Policy Normalization	April 2023, Chapter 1
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Fiscal Policy from Pandemic to War	April 2022, Chapter 1
Inflation and Fiscal Nexus: Empirical Findings	April 2022, Online Annex 1.3

XIII. Innovation, Entrepreneurship, Research, Development, and Investment

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
Building a Resilient Future	October 2022, Box 1.1
Public Investment for the Recovery	October 2020, Chapter 2
Maintaining Quality When Scaling Up Public Investment	October 2020, Online Annex 2.3
How Green Is the Fiscal Response to the COVID-19 Crisis?	October 2020, Box 1.2
Estimating Public Investment Needs for Climate Change Adaptation	October 2020, Box 2.1
The Macroeconomic Effects of Public Investment: A Model-Based Analysis	April 2020, Online Annex 2.1
Digital Government	April 2018, Chapter 2
The Role of Patents for Innovation	October 2016, Box 2.1
Fiscal Policy and Green Innovation	October 2016, Box 2.2
Does Preferential Tax Treatment of Income from Intellectual Property Promote Innovation?	October 2016, Box 2.3
Innovation in Brazil, Russia, India, China, and South Africa (BRICS)	October 2016, Box 2.4
Programs for Young Innovators and Start-Ups	October 2016, Box 2.5
Fiscal Policy, Research and Development, and Total Factor Productivity Growth	October 2016, Annex 2.1
Corrective Fiscal Incentives for Research and Development	October 2016, Annex 2.2
Taxation and Entrepreneurship	October 2016, Annex 2.4
Fiscal Policies for Innovation and Growth	April 2016, Chapter 2

XIV. Interest Rates

Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Inflation and Fiscal Nexus: Empirical Findings	April 2022, Online Annex 1.3
The Weakened Relation between Sovereign Spreads and Debt	October 2021, Online Annex 2.2
Fiscal Credibility Indicators Using Private Forecasts	October 2021, Online Annex 2.4
The Dog That Didn't Bark (So Far): Low Interest Rates in the United States and Japan	September 2011, Chapter 3
Debt Dynamics and the Interest Rate–Growth Differential	April 2011, Box 3.1
Interest Rate–Growth Differential	November 2010, Appendix 1

XV. Low-Income Countries

Improving Tax Capacity in Emerging Market and Developing Economies	April 2023, Box 1.1
The Long-Run Payoff of Tax Administration Reforms	April 2023, Online Annex 1.1
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Fiscal Developments in Countries Participating in the Debt Suspension Initiative	October 2021, Box 1.2
Digital Government	April 2018, Chapter 2
Digitalization and Property Taxation in Developing Economies	April 2018, Box 2.2
Digitalizing Government Payments in Developing Economies	April 2018, Box 2.3
The Digitalization of Public Finances: Country Case Studies	April 2018, Annex 2.1
The Fiscal Implications of Slowing Global Trade for Emerging Market and Developing Economies	April 2016, Box 1.1
The Fiscal Implications of International Bond Issuance by Low-Income Developing Countries	October 2014, Box 1.2
Confronting Trade-Offs: Accommodating Spending Pressures in Low-Income Countries	September 2011, Chapter 6
Global Fuel and Food Price Shocks and Fiscal Performance in Low-Income Countries	September 2011, Box 8

XVI. Policy and Reform

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Helping People Bounce Back	October 2022, Chapter 1
Coordinating Taxes across Borders	April 2022, Chapter 2
The Need for Timely and Accurate Beneficial-Ownership Information	April 2022, Box 2.1

Estimating the Revenue Impact of Pillar 1 and 2	April 2022, Online Annex 2.1
Emissions Equivalence of Other Mitigation Approaches to Carbon Pricing	April 2022, Online Annex 2.5
Fiscal Policies to Address the COVID-19 Pandemic	October 2020, Chapter 1
<i>IDEAS</i> to Respond to Weaker Growth	April 2020, Chapter 2
Capitalizing on Good Times	April 2018
Tackling Inequality	October 2017, Chapter 1
Upgrading the Tax System to Boost Productivity	April 2017, Chapter 2
What Are the Budgetary Costs and Gains of Structural Reforms?	April 2017, Box 1.2
Do Fiscal Rules Lower Sovereign Borrowing Costs in Countries with Weak Track Records of Fiscal Performance?	April 2017, Box 1.5
Debt: Use It Wisely	October 2016, Chapter 1
Policies during Deleveraging Episodes	October 2016, Annex 1.5
Benefits of Targeted Fiscal Interventions at Times of Private Deleveraging	October 2016, Box 1.4
An Active, Supportive Role for Fiscal Policy	April 2015, Chapter 1
Can Fiscal Policy Stabilize Output?	April 2015, Chapter 2
Public Expenditure Reform: Making Difficult Choices	April 2014, Chapter 2
Expenditure Rules: Effective Tools for Sound Fiscal Policy	April 2014, Appendix 1
The Future of the State: Testing the Wagner and Baumol Hypotheses	April 2014, Box 2.1
Fiscal Reforms to Unlock Economic Potential in the Arab Countries in Transition	October 2013, Box 2
Tricks of the Trade	October 2013, Box 5
How Can Fiscal Councils Strengthen Fiscal Performance?	April 2013, Box 1
Commonly Used Definitions of the Fiscal Balance	October 2012, Box 1
The “Two-Pack”: Further Reforms to Fiscal Governance in the Euro Area	October 2012, Box 6
Anchoring Medium-Term Fiscal Credibility: The Second Generation of Fiscal Rules	April 2012, Chapter 6
Measuring Fiscal Space: A Critical Review of Existing Methodologies	April 2012, Box 1
The “Fiscal Compact”: Reforming EU Fiscal Governance	April 2012, Box 5
Assessing the Cyclicalities of Subnational Government Policies	April 2012, Box A3.2
“Fiscal Devaluation”: What Is It—and Does It Work?	September 2011, Appendix 1
Fiscal Aspects of EU Economic Governance Reforms	April 2011, Box 4.1
Fiscal Transparency under Pressure	April 2011, Appendix 2
The European Union: Reforming Fiscal Governance	November 2010, Box 3.2
Fiscal Rules—Recent Developments	May 2010, Box 7

XVII. Poverty and Inequality

Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Fiscal Policy from Pandemic to War	April 2022, Chapter 1
Social Protection and Poverty During the Pandemic	April 2022, Box 1.1
Poverty Projections using Growth Forecasts	April 2022, Online Annex 1.1
Analysis of Poverty, Social Safety Nets, and Informality	April 2022, Online Annex 1.2
Long-Term Distributional Impact of the American Families Plan	October 2021, Box 1; Online Annex 1.2
Persistent Consequences of Wealth Inequality for the Next Generation’s Income: The Case of Norway	April 2021, Box 2.1
Public Preferences for Progressive Taxation in the Post–COVID-19 World	April 2021, Box 2.2
How Will the COVID-19 Pandemic Affect Poverty and Inequality?	October 2020, Online Annex 1.1
Tackling Inequality	October 2017, Chapter 1
Global Inequality Today and in 2035	October 2017, Box 1.1
Equally Distributed Equivalent Level of Income as a Measure of Social Welfare	October 2017, Box 1.2
Bolivia: Inequality Decline during a Commodity Boom	October 2017, Box 1.3
Inequality Dimensions: Wealth, Opportunities, and Gender	October 2017, Annex 1.2

XVIII. Private Debt

Private Debt and Public Sector Risk	October 2020, Box 1.1
Private Debt and Its Discontents	April 2018, Box 1.1
Debt: Use It Wisely	October 2016, Chapter 1
Debt Data Set	October 2016, Annex 1.1
Private and Public Debt and the Pace of Recovery	October 2016, Annex 1.2
Interlinkages between Public and Private Debt: Selected Summary of the Literature	October 2016, Annex 1.3
Private Deleveraging and the Role of Fiscal Policy	October 2016, Annex 1.4
Policies during Deleveraging Episodes	October 2016, Annex 1.5
Benefits of Targeted Fiscal Intervention during Times of Private Deleveraging	October 2016, Box 1.4

XIX. Privatization and Public Enterprises

Experience with Privatization	April 2020, Box 3.1
General Government Nonfinancial Assets: What Do We Know?	October 2012, Box 7
Government Shares in Publicly Listed Companies	April 2012, Box 3
United States: Government-Sponsored Enterprises and Contingent Liabilities	September 2011, Box 1
Adjusting Public Capital Stock for Investment Inefficiency	September 2011, Box 9
Insights for Privatization Plans from Previous Large Episodes	September 2011, Appendix 2

XX. Revenue

Improving Tax Capacity in Emerging Market and Developing Economies	April 2023, Box 1.1
The Long-Run Payoff of Tax Administration Reforms	April 2023, Online Annex 1.1
Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Coordinating Taxes across Borders	April 2022, Chapter 2
Estimating the Revenue Impact of Pillar 1 and 2	April 2022, Online Annex 2.1
Corporate Tax Rate Strategic Reaction	April 2022, Online Annex 2.2
Survey of International Coordination and Tax Administration	April 2022, Online Annex 2.3
Revenue Implications of Cross-Border Remote Work	April 2022, Online Annex 2.4
Emissions Equivalence of Other Mitigation Approaches to Carbon Pricing	April 2022, Online Annex 2.5
Digital Government	April 2018, Chapter 2
Digitalization Advances in Revenue Administration in South Africa and Estonia	April 2018, Box 2.1
Digitalization and Property Taxation in Developing Economies	April 2018, Box 2.2
Small Business Taxation and the P2P Economy	April 2018, Box 2.5
The Digitalization of Public Finances: Country Case Studies	April 2018, Annex 2.1
Estimating the Impact of Digitalization on Tax Evasion from Cross-Border Fraud	April 2018, Annex 2.2
Estimating the Distribution of Tax Revenue Collection from Offshore Income and Wealth Following Improved Cross-Country Information Exchange	April 2018, Annex 2.3
Upgrading the Tax System to Boost Productivity	April 2017, Chapter 2
Past, Present, and Future Patterns in Revenues	April 2015, Box 1.1
Assessing Potential Revenue: Two Approaches	October 2013, Appendix 2
Increasing Revenue from Real Property Taxes	October 2013, Appendix 3
Past Episodes of Sustained Fiscal Revenue Increases	May 2010, Box 6

XXI. Social Expenditures

Brazil's Emergency Cash Transfer Program	October 2022, Online Annex 1.3
Fiscal Policy from Pandemic to War	April 2022, Chapter 1
Measures in Response to High Energy and Food Prices	April 2022, Box 1.2
Smart Strategies to Contain the COVID-19 Pandemic	October 2020, Online Annex 1.2

From Lockdown to Recovery: Spending Measures to Support Livelihoods during the COVID-19 Crisis	October 2020, Online Annex 1.3
Understanding the Implications of Different Types of Fiscal Measures for Public Finances	April 2020, Box 1.1
<i>IDEAS</i> to Respond to Weaker Growth	April 2020, Chapter 2
State-Owned Enterprises: The Other Government	April 2020, Chapter 3
Digital Government	April 2018, Chapter 2
Tackling Inequality	October 2017, Chapter 1
The Fiscal Response to the Refugee Influx in Europe	April 2016, Box 1.2
The Pressure of Age-Related Spending on Public Debt in Advanced Economies	April 2015, Box 1.3
Targeted Employer Social Security Contribution Cuts: Lessons from Experiences in Advanced Economies	October 2014, Box 2.1
Public Expenditure Reform: Making Difficult Choices	April 2014, Chapter 2
Moment of Truth: Unfunded Pension Liabilities and Public Debt Statistics	April 2014, Box 1.1
Structural Measures and Social Dialogue	April 2014, Box 2.2
Health System Inefficiencies	April 2014, Box 2.3
Recent Developments in Public Health Spending and Outlook for the Future	October 2013, Appendix 1
Confronting Trade-Offs: Accommodating Spending Pressures in Low-Income Countries	September 2011, Chapter 6
Potential Reform Strategies to Contain the Growth of Public Health Spending	April 2011, Box A1.1
The US National Commission Report	April 2011, Box A5.1
Tackling the Challenge of Health Care Reform in Advanced Economies	April 2011, Appendix 1
Selected Spending and Tax Issues	November 2010, Chapter 5
Advanced Economies: The Outlook for Public Health Spending	November 2010, Box 3.1
Increasing Social Expenditures and Household Consumption in China	May 2010, Box 4
Health Care Reforms in the United States	May 2010, Box 5

XXII. Stabilization

Inflation and Disinflation: What Role for Fiscal Policy?	April 2023, Chapter 2
Income Stabilization before and during the COVID-19 Pandemic across EU Countries: A Microsimulation Approach	October 2022, Online Annex 1.2
Designing Fiscal Tools to Build Resilience: A DSGE-Based Analysis	October 2022, Online Annex 1.4
Policy Options to Support the Economic Recovery	October 2020, Online Annex 1.5
<i>IDEAS</i> to Respond to Weaker Growth	April 2020, Chapter 2
Can Fiscal Policy Stabilize Output?	April 2015, Chapter 2
Fiscal Stabilization under Alternative Estimates of the Output Gap	April 2015, Box 2.1
Boosting the Effectiveness of Automatic Stabilizers	April 2015, Box 2.2

XXIII. Stimulus

Determining the Size of Fiscal Stimulus for Sustained Recovery	October 2020, Online Annex 1.4
Public Investment Fiscal Multiplier and Macroeconomic Uncertainty	October 2020, Online Annex 2.5
The G-20 Economies: Crisis-Related Discretionary Fiscal Stimulus	November 2010, Box 1.1
Update on Crisis-Related Discretionary Fiscal Stimulus in G-20 Economies	May 2010, Appendix 1

XXIV. Subsidies

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
Externalities from Energy Pricing Subsidies	October 2022, Online Annex 1.5
Fiscal Policy from Pandemic to War	April 2022, Chapter 1
Measures in Response to High Energy and Food Prices	April 2022, Box 1.2
Digital Government	April 2018, Chapter 2
The Digitalization of Public Finances: Country Case Studies	April 2018, Annex 2.1

Adopting a Universal Basic Income to Support Subsidy Reform in India	October 2017, Box 1.6
Reforming Energy Subsidies	April 2015, Box 1.2
Reforming Petroleum Subsidies	April 2010, Appendix 5

XXV. Sustainability and Risk Management

Climate Crossroads: Fiscal Policies in a Warming World	October 2023, Chapter 1
Toward Green Public Finance Management	April 2022, Box 1.3
Media Coverage of Suspension of Fiscal Rules	October 2021, Box 2.2
Assessing Unexpected Increases in Debt	October 2021, Online Annex 2.3
Investing in Resilience	October 2020, Online Annex 2.6
Estimating the Adaptation Costs of Investing in the Resilience of Physical Assets	October 2020, Online Annex 2.7
State-Owned Enterprises: The Other Government	April 2020, Chapter 3
Can Countries Sustain Higher Levels of Public Debt?	April 2017, Box 1.4
Developing a Fiscal Risk Management Framework	April 2016, Box 1.4
Reassuring Markets about Fiscal Sustainability in the Euro Area	September 2011, Chapter 2
Assessing and Mitigating Fiscal Sustainability Risks	April 2011, Chapter 4
Assessing Fiscal Sustainability Risks: Deriving a Fiscal Sustainability Risk Map	April 2011, Appendix 3

XXVI. Taxation

Improving Tax Capacity in Emerging Market and Developing Economies	April 2023, Box 1.1
The Long-Run Payoff of Tax Administration Reforms	April 2023, Online Annex 1.1
Coordinating Taxes across Borders	April 2022, Chapter 2
Estimating the Revenue Impact of Pillar 1 and 2	April 2022, Online Annex 2.1
Corporate Tax Rate Strategic Reaction	April 2022, Online Annex 2.2
Survey of International Coordination and Tax Administration	April 2022, Online Annex 2.3
Revenue Implications of Cross-Border Remote Work	April 2022, Online Annex 2.4
Emissions Equivalence of Other Mitigation Approaches to Carbon Pricing	April 2022, Online Annex 2.5
Persistent Consequences of Wealth Inequality for the Next Generation's Income: The Case of Norway	April 2021, Box 2.1
Public Preferences for Progressive Taxation in the Post-COVID-19 World	April 2021, Box 2.2
Tax Policy and Automatic Stabilizers	April 2020, Box 2.2
Curbing Corruption	April 2019, Chapter 2
Avoiding International Tax Wars	April 2019, Box 1.3
Digital Government	April 2018, Chapter 2
The Distributional Effects of Income Tax Cuts in the United States	April 2018, Box 1.2
International Tax Policy Implications from US Corporate Tax Reform	April 2018, Box 1.3
Digitalization Advances in Revenue Administration in South Africa and Estonia	April 2018, Box 2.1
Digitalization and Property Taxation in Developing Economies	April 2018, Box 2.2
Small Business Taxation and the P2P Economy	April 2018, Box 2.5
The Digitalization of Public Finances: Country Case Studies	April 2018, Annex 2.1
Estimating the Impact of Digitalization on Tax Evasion from Cross-Border Fraud	April 2018, Annex 2.2
Estimating the Distribution of Tax Revenue Collection from Offshore Income and Wealth Following Improved Cross-Country Information Exchange	April 2018, Annex 2.3
Tackling Inequality	October 2017, Chapter 1
Measuring Tax Progressivity	October 2017, Box 1.4
Taxing Wealth and Wealth Transfers	October 2017, Box 1.5
Upgrading the Tax System to Boost Productivity	April 2017, Chapter 2
The Destination-Based Cash Flow Tax: A Primer	April 2017, Box 1.1

What Is the Effective Marginal Tax Rate?	April 2017, Box 2.1
Colombia: Labor Tax Reform and the Shift from Informal to Formal Employment	April 2017, Box 2.2
Mozambique: Differential Tax Treatment across Firms	April 2017, Box 2.3
Taxation and Foreign Direct Investment	October 2016, Annex 2.3
Taxation and Entrepreneurship	October 2016, Annex 2.4
Taxing Our Way out of—or into?—Trouble	October 2013, Chapter 2
Learning from the Crisis? Taxation and Financial Stability	October 2013, Box 3
Taxation and Growth: Details Matter	October 2013, Box 4
A One-Off Capital Levy?	October 2013, Box 6
Increasing Revenue from Real Property Taxes	October 2013, Appendix 3
Do Pensioners Get Special Treatment on Taxes?	October 2012, Box 5
Containing Tax Expenditures	April 2011, Appendix 5
Selected Spending and Tax Issues	November 2010, Chapter 5

IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, SEPTEMBER 2023

The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the Fiscal Monitor, Global Financial Stability Report, and World Economic Outlook on September 26, 2023.

Executive Directors broadly agreed with staff's assessment of the global economic outlook, risks, and policy priorities. They welcomed the continued global economic resilience, particularly of some advanced and emerging market economies, but acknowledged that divergent growth prospects across the world's regions pose a challenge to returning to pre-pandemic output trends. In the case of many emerging market and developing economies (EMDEs), the loss of momentum has reduced prospects for income convergence. Directors recognized that tight monetary policies, necessary to fight inflation, and the withdrawal of fiscal policy support to tackle soaring global debt and support disinflation efforts are also headwinds to growth in the short run. Most Directors agreed that increasing geoeconomic fragmentation is also weighing on the recovery and welcomed the Fund's analysis on the costs of fragmentation. A few Directors emphasized that diversification in supply chains is important to build resilience. More generally, a number of Directors stressed that the Fund's communication on geoeconomic fragmentation should be balanced. Directors generally agreed that ending Russia's war against Ukraine remains the single most impactful action to improve the global outlook.

Directors broadly agreed that risks to the outlook are more balanced relative to April 2023, but remain tilted to the downside. While the acute stress in the banking system seen in March this year has subsided, in part due to swift action in Switzerland and the United States, they broadly noted that financial stability risks remain elevated. In particular, Directors emphasized that persistence in global underlying inflation could warrant higher-for-longer policy rates, which could in turn trigger a correction in financial markets and capital flow volatility. They also considered that commodity prices could see more

volatility due to climate and geopolitical shocks. Most Directors noted the risk of a further deterioration in China's property sector and, in this regard, welcomed the recent policy actions taken by the authorities. Directors also highlighted the risk of further debt distress in those EMDEs heavily reliant on external borrowing and generally indicated that the presence of a weak tail of banks in some major economies also poses vulnerabilities. Directors emphasized that should financial conditions tighten abruptly, adverse feedback loops could be triggered and again test the resilience of the global financial system.

Directors noted that global core inflation remains persistent and declining only slowly, and stressed that monetary policy should maintain a restrictive policy stance, tailored to country circumstances, until inflation declines sustainably to target. They called for clear and transparent communication to avoid a de-anchoring of inflation expectations. Directors also indicated that policies aimed at encouraging labor market participation can help ease labor market tightness in many advanced economies, which would support disinflation.

Directors acknowledged that the fast pace of monetary policy tightening adds further pressure on the financial sector, requiring careful monitoring of risks, better risk assessment and strengthened supervision, and closing supervision gaps in the nonbank financial sector. They called for an assessment of how consistently international standards in banking regulation were implemented during recent financial stresses. Noting vulnerabilities in the commercial real estate sector of some countries, Directors called for continued vigilance and close monitoring.

Directors stressed the need to gradually tighten fiscal policies as deficits and debt remain elevated. They considered that, although the primary responsibility for restoring price stability lies with central banks,

tightening the fiscal stance can further ease inflation by reducing aggregate demand and reinforcing the overall credibility of disinflation strategies. Directors recommended mobilizing revenues through tax capacity building and achieving efficiency gains in spending to help restore some fiscal space, while safeguarding targeted measures to protect the most vulnerable. They also noted that some countries in debt distress may require preemptive and orderly debt restructuring, underscoring the importance of multilateral cooperation in this regard.

Directors expressed concern over the dimming growth prospects for the medium term. In this context, they emphasized the importance of facilitating investment and of targeted and carefully sequenced supply-side reforms, which can enhance productivity growth despite constrained policy space and help dampen inflationary pressures.

Directors called for accelerating decarbonization efforts, while noting that the policy mix will need to strike a balance between climate goals, fiscal sustainability, and political feasibility. They agreed that relying mostly on spending-based measures will be costly and instead favored a combination of revenue, expenditure, and other financing and structural policies to deliver on climate goals. In this context, most Directors agreed that a policy package containing carbon pricing, complemented with measures to address market failures, catalyze private finance and green investment, and mitigate distributional concerns has higher chances to deliver on climate goals and

maintain debt sustainability. Some Directors reiterated, however, that carbon pricing is not an adequate solution in all countries. Directors acknowledged that the green transition will be challenging, particularly for EMDEs with high debt and sizable investment needs; at the same time, delaying the transition will only increase its costs. They generally agreed that incorporating climate change considerations into debt sustainability analyses could improve policy planning, while taking into consideration country-specific characteristics.

Directors underscored that internationally coordinated efforts are indispensable to minimize the cost of decarbonization, especially for low-income countries and small developing states. In this context, they highlighted the important catalytic role that the Resilience and Sustainability Trust could play in attracting green financing and investments. Directors stressed that green industrial policies should avoid distortions to trade and investment flows, in line with the rules of the World Trade Organization (WTO). In this context, a few Directors emphasized that measures such as carbon border adjustment mechanisms should also be WTO-compliant to safeguard international trade. While they considered that, in principle, green and food corridor agreements could help safeguard the energy transition and avert food insecurity, a few Directors underscored the difficulty of implementing these mechanisms. More generally, Directors emphasized that safeguarding the rules-based trading system would be important for global prosperity.

INTERNATIONAL MONETARY FUND

WORLD ECONOMIC OUTLOOK



INTERNATIONAL MONETARY FUND

GLOBAL FINANCIAL STABILITY REPORT

REGIONAL ECONOMIC OUTLOOKS

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IN THIS ISSUE:

CHAPTER 1

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