

# EXECUTIVE SUMMARY

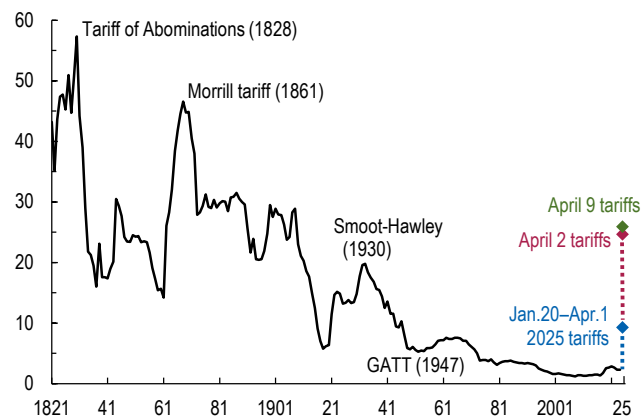
Following an unprecedented series of shocks in the preceding years, global growth was stable yet underwhelming through 2024 and was projected to remain so in the January 2025 *World Economic Outlook (WEO) Update*. However, the landscape has changed as governments around the world reorder policy priorities. Since the release of the January 2025 *WEO Update*, a series of new tariff measures by the United States and countermeasures by its trading partners have been announced and implemented, ending up in near-universal US tariffs on April 2 and bringing effective tariff rates to levels not seen in a century (Figure ES.1). This on its own is a major negative shock to growth. The unpredictability with which these measures have been unfolding also has a negative impact on economic activity and the outlook and, at the same time, makes it more difficult than usual to make assumptions that would constitute a basis for an internally consistent and timely set of projections.

Given the complexity and fluidity of the current moment, this report presents a “reference forecast” based on information available as of April 4, 2025 (including the April 2 tariffs and initial responses), in lieu of the usual baseline. This is complemented with a range of global growth forecasts, primarily under different trade policy assumptions.

The swift escalation of trade tensions and extremely high levels of policy uncertainty are expected to have a significant impact on global economic activity. Under the reference forecast that incorporates information as of April 4, global growth is projected to drop to 2.8 percent in 2025 and 3 percent in 2026—down from 3.3 percent for both years in the January 2025 *WEO Update*, corresponding to a cumulative downgrade of 0.8 percentage point, and much below the historical (2000–19) average of 3.7 percent.

In the reference forecast, growth in advanced economies is projected to be 1.4 percent in 2025. Growth in the United States is expected to slow to 1.8 percent, a pace that is 0.9 percentage point lower relative to the projection in the January 2025 *WEO Update*, on account of greater policy uncertainty, trade tensions, and softer demand momentum, whereas growth in the euro area at 0.8 percent is expected to slow by 0.2 percentage point. In emerging market and developing economies, growth is expected to slow down to 3.7 percent in 2025 and 3.9 percent in 2026, with significant downgrades for countries affected most by recent trade measures, such

**Figure ES.1. US Effective Tariff Rates on All Imports (Percent)**



Sources: US Bureau of the Census, *Historical Statistics of the United States, 1789–1945*; and IMF staff calculations.

Note: The Jan.20–Apr.1 tariffs in 2025 include 20 percent tariffs on China; 25 percent tariffs on steel and aluminum; 25 percent tariffs on Mexico and Canada; and a 10 percent tariff on Canadian energy imports. A United States–Mexico–Canada Agreement (USMCA) carve-out is assumed to halve the effective tariff increase for Canada and Mexico. The April 2 tariffs include auto sector tariffs and country-specific tariffs, applying exemptions provided in Annex II of the Executive Order per IMF staff judgment. The April 9 tariffs include an increase in the tariffs on China to 145 percent and a reduction in other country-specific tariffs to 10 percent. It also includes exemptions on some electronic products announced on April 11. GATT = General Agreement on Tariffs and Trade.

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as China. Global headline inflation is expected to decline at a pace that is slightly slower than what was expected in January, reaching 4.3 percent in 2025 and 3.6 percent in 2026, with notable upward revisions for advanced economies and slight downward revisions for emerging market and developing economies in 2025.

Intensifying downside risks dominate the outlook. Ratcheting up a trade war, along with even more elevated trade policy uncertainty, could further reduce near- and long-term growth, while eroded policy buffers weaken resilience to future shocks. Divergent and rapidly shifting policy stances or deteriorating sentiment could trigger additional repricing of assets beyond what took place after the announcement of sweeping US tariffs on April 2 and sharp adjustments in foreign exchange rates and capital flows, especially for economies already facing debt distress. Broader financial instability may ensue, including damage to the international monetary system. Demographic shifts and a shrinking foreign labor force may curb potential growth and threaten fiscal sustainability. The lingering effects of the recent cost-of-living crisis, coupled with depleted policy space and dim medium-term growth prospects, could reignite social unrest. The resilience shown by many large emerging market economies may be tested as servicing high debt levels becomes more challenging in unfavorable global financial conditions. More limited international development assistance may increase the pressure on low-income countries, pushing them deeper into debt or necessitating significant fiscal adjustments, with immediate consequences for growth and living standards. On the upside, a deescalation from current tariff rates and new agreements providing clarity and stability in trade policies could lift global growth.

The path forward demands clarity and coordination. Countries should work constructively to promote a stable and predictable trade environment, facilitate debt restructuring, and address shared challenges. At the same time, they should address domestic policy and structural imbalances, thereby ensuring their internal economic stability. This will help rebalance growth-inflation trade-offs, rebuild buffers, and reinvigorate medium-term growth prospects, as well as reduce global imbalances. The priority for central banks remains fine-tuning monetary policy stances to achieve their mandates and ensure price and financial stability in an environment with even more difficult trade-offs. Mitigating disruptive foreign exchange volatility may require targeted interventions, as outlined in the IMF's Integrated Policy Framework. Macroprudential tools should be activated as needed to contain the buildup of vulnerabilities and to provide support in case of stress events. Restoring fiscal space and putting public debt on a sustainable path remain an important priority, while meeting critical spending needs to ensure national and economic security. This requires credible medium-term fiscal consolidation plans. Structural reforms in labor, product, and financial markets would complement efforts to reduce debt and narrow cross-country disparities. As Chapter 2 explains, countries' age structures are evolving at different rates, with important consequences for medium-term growth and external imbalances. In addition, as Chapter 3 documents, migration policy shifts in destination countries have sizable spillover effects, disproportionately affecting emerging market and developing economies.

# FOREWORD

This April 2025 *World Economic Outlook* (WEO) was put together under exceptional circumstances, and I want to start by acknowledging the tremendous work of Petya Koeva Brooks, Deputy Director in the Research Department, and her team, as well as the staff of over 190 country teams within the IMF who worked tirelessly with us to revise their country projections until the very last minute. The April 2 Rose Garden announcement forced us to jettison our projections—nearly finalized at that point—and compress a production cycle that usually takes more than two months into less than 10 days.

Shortly after the January 2025 WEO *Update*, the United States announced multiple waves of tariffs on major trading partners and critical sectors, culminating on April 2 with a set of nearly universal tariffs. While many of the scheduled tariff increases are on hold for now, the combination of measures and countermeasures has hiked US and global tariff rates to centennial highs. However, the context for such increases is very different. Unlike in the previous century, the global economy is now characterized by a high degree of economic and financial integration, with supply chains and financial flows crisscrossing the world, whose potential unwinding could constitute a major source of economic upheaval.

For this reason, we expect that the sharp increase on April 2 in both tariffs and uncertainty will lead to a significant slowdown in global growth in the near term. While this is our central scenario—or “reference forecast”—many possible paths exist, reflecting the unpredictability surrounding future trade policy and the varied impact of tariffs across different countries through a diverse set of channels. These are discussed in detail in Chapter 1.

The common denominator, however, is that tariffs are a negative supply shock for the economy imposing them, as resources are reallocated toward the production of noncompetitive goods, with a resulting loss of aggregate productivity, lower activity, and higher production costs and prices. Moreover, in the medium term, by reducing competition, tariffs increase the market power of domestic producers, decrease incentives to innovate, and create multiple opportunities for rent seeking. For trading partners, tariffs constitute mostly a negative external demand shock, driving foreign customers away from their products, even if some countries could benefit from the rerouting of trade flows.

These effects are magnified in the presence of modern complex global supply chains. Most traded goods are intermediate inputs that traverse countries multiple times before their transformation into final products. Sectoral disruptions could propagate up and down the global input-output network in ways with potentially large multiplier effects, just as we saw during the pandemic. Anticipating such disruptions we have also revised down our projection for global trade growth by 1½ percentage points this year, with a slight recovery penciled in for 2026.

The uncertainty around trade policy is also a major factor depressing our outlook. Faced with increased uncertainty about access to markets—their own but also those of their suppliers and customers—many firms’ initial reaction will be to pause, reduce investment, and cut purchases. Likewise, financial institutions will reevaluate their credit supply to businesses, until they can assess the latter’s exposure to the new environment. The combined increased uncertainty and resulting

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tightening of financial conditions are a global negative demand shock and will weigh on activity. This could well dominate in the short term—as reflected in the sharp decline in oil prices.

The effect of tariffs on exchange rates is not straightforward. First, the US, as the tariffing economy, may see its currency appreciate, as happened in previous episodes. This reflects the reduced demand for foreign currency as the demand for imports declines, but also the likelihood that tariffed countries may ease their monetary policy stance to respond to the negative demand shock. However, greater policy uncertainty, lower growth prospects in the US, and an adjustment in the global demand for dollar assets—which has been orderly so far—can weigh on the dollar, as we saw in the immediate aftermath of the announcements. In the medium term, the dollar may depreciate in real terms if tariffs translate into lower productivity in the US tradables sector, relative to its trading partners.

At this juncture, while the situation remains fluid, risks remain firmly tilted to the downside. The global economy showed surprising resilience during the severe shocks of the past four years and still bears significant scars. It is now being severely tested once again, especially in emerging market and developing economies with more limited buffers. More immediately, there is a risk that trade retaliation may further ratchet up—instead of dialing down—trade tensions, with negative consequences for global growth. Financial conditions may further tighten—perhaps abruptly—if markets react negatively to diminished growth prospects and increased uncertainty. While banks remain well capitalized overall, and market movements have been orderly so far, they may be tested in the case of a full-blown risk-off episode. The April 2025 *Global Financial Stability Report* reviews these market developments in detail. Yet herein lies also an upside: If countries deescalate from their current tariff stance, and coordinate to deliver clarity and stability on trade policy, the outlook could immediately brighten.

Our policy prescriptions call for prudence, clarity, and increased collaboration. First, on trade policy the message is clear: to bring back stability and find mutually beneficial trade arrangements. It is not clear yet what new architecture will emerge. But businesses need predictability going forward. And the global economy needs a well-functioning rules-based trading system that addresses long-standing gaps, such as the pervasive use of nontariff barriers and trade-distorting measures by some countries.

Second, monetary policy will need to remain ahead of the curve in the face of multiple challenges. Faced with tariffs and supply-chain disruptions, some countries may confront steeper trade-offs between inflation and output. Inflation expectations may become less well anchored with a new inflation shock following so close on the heels of the previous one. For these countries, forceful tightening will be needed. For others, the negative demand shock will dominate, and their economies may slump unless policy rates are lowered. In all cases, credibility of the monetary policy framework—and its cornerstone, central bank independence—will remain key.

Third, currency markets may experience strong volatility. This may be difficult to navigate, especially for emerging market economies. In line with our Integrated Policy Framework, it is important that countries let their currency adjust when the movements are driven by fundamental policy forces, as is the case now. That framework spells out the specific conditions under which it could be advisable for countries to intervene in currency markets.

Fourth, fiscal authorities face starker trade-offs on top of preexisting vulnerabilities associated with high debt, low growth, and rising financing costs. Heightened pressure on bond yields amid growing market nervousness could threaten fiscal stability. In addition, new spending pressures are further weighing on fiscal fragilities. Calls for support will increase for those at risk of severe dislocation from trade policy. Some support may be inevitable—and even desirable—but should remain narrowly targeted and incorporate automatic sunset clauses. The experience of the past four years suggests that it is easier to open the tap of fiscal support than to close it. Sunset clauses should also help frame expectations. Moreover, some countries, especially in Europe, face new and permanent increases in defense-related spending.

How should these new outlays be financed? For countries with little fiscal space, the answer is stark but simple: They have little choice but to stay within their budgetary envelope. Doing otherwise would jeopardize medium-term debt sustainability, with dire consequences. For countries with sufficient fiscal space, standard fiscal principles suggest that only the temporary part of the additional spending—for example, temporary support to help adapt to the new environment or an initial bulge in spending to rebuild defense capabilities—should be financed by debt. New permanent spending needs should be offset by spending cuts elsewhere or stronger domestic revenue mobilization. These points are further developed in the April 2025 *Fiscal Monitor*.

Fifth, we need to continue efforts to turn the tide on weak medium-term growth prospects. This means boosting total factor productivity, which can be raised by addressing existing deep-seated structural constraints that are holding back innovation, but also by exploiting technological breakthroughs. The recent progress of generative artificial intelligence offers such a promise, and countries should position themselves to harness it responsibly. This can be done by implementing policies to develop the necessary digital infrastructure and acquire the skills necessary to benefit from the artificial intelligence transition.

In this direction, the analytical chapters of our report take a step back and explore how the nexus of labor supply and growth plays out over the medium term. They tackle interrelated themes of asynchronous aging and migration. Chapter 2—“The Rise of the Silver Economy”—focuses on the challenges from demographic headwinds for growth and public finances and shows that progress in “healthy aging”—people living not only longer, but living healthier—has been substantial. This, together with policies that help increase labor force participation and close gender gaps, can offset some of the negative effects of aging populations. Chapter 3—“Journeys and Junctions”—focuses on the spillover from migration policies in destination countries to origin, transit, and bordering economies. It highlights that emerging market and developing economies are increasingly on the receiving end of migration and refugee flows and that policies to improve the integration of migrants, minimizing skills mismatches, and alleviate pressures on local infrastructure can have large effects.

Pierre-Olivier Gourinchas

*Economic Counsellor*

# ASSUMPTIONS AND CONVENTIONS

A number of assumptions have been adopted for the projections presented in the *World Economic Outlook* (WEO). It has been assumed that real effective exchange rates remained constant at their average levels during March 6, 2025–April 3, 2025, except for those for the currencies participating in the European exchange rate mechanism II, which are assumed to have remained constant in nominal terms relative to the euro; that established policies of national authorities will be maintained (for specific assumptions about fiscal and monetary policies for selected economies, see Box A1 in the Statistical Appendix); that the average price of oil will be \$66.94 a barrel in 2025 and \$62.38 a barrel in 2026; that the three-month government bond yield for the United States will average 4.2 percent in 2025 and 3.5 percent in 2026, that for the euro area will average 2.2 percent in 2025 and 2.1 percent in 2026, and that for Japan will average 0.5 percent in 2025 and 0.8 percent in 2026; and that the 10-year government bond yield for the United States will average 4.2 percent in 2025 and 3.8 percent in 2026, that for the euro area will average 2.6 percent in 2025 and 2.7 percent in 2026, and that for Japan will average 1.4 percent in 2025 and 1.6 percent in 2026. These are, of course, working hypotheses rather than forecasts, and the uncertainties surrounding them add to the margin of error that would, in any event, be involved in the projections. The estimates and projections are based on statistical information available through April 14, 2025, but may not reflect the latest published data in all cases. For the date of the last data update for each economy, please refer to the notes provided in the online WEO database. Some economies have revised projections based on developments in commodity markets and international trade as of April 4, 2025; these economies are listed in Box A2 in the Statistical Appendix.

The following conventions are used throughout the WEO:

- . . . to indicate that data are not available or not applicable;
- – between years or months (for example, 2023–24 or January–June) to indicate the years or months covered, including the beginning and ending years or months; and
- / between years or months (for example, 2023/24) to indicate a fiscal or financial year.
- “Billion” means a thousand million; “trillion” means a thousand billion.
- “Basis points” refers to hundredths of 1 percentage point (for example, 25 basis points are equivalent to  $\frac{1}{4}$  of 1 percentage point).
- Data refer to calendar years, except in the case of a few countries that use fiscal years. Please refer to Table F in the Statistical Appendix, which lists the economies with exceptional reporting periods for national accounts and government finance data.
- For some countries, the figures for 2024 and earlier are based on estimates rather than actual outturns. Please refer to Table G in the Statistical Appendix, which lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments for each country.

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What is new in this publication:

- For Bolivia, projections for 2027–30 have been omitted because of significant uncertainty regarding the economic outlook.
- For Ecuador, fiscal projections for 2025–30 are excluded from publication because of ongoing program discussions.

In the tables and figures, the following conventions apply:

- Tables and figures in this report that list their source as “IMF staff calculations” or “IMF staff estimates” draw on data from the WEO database.
- When countries are not listed alphabetically, they are ordered on the basis of economic size.
- Minor discrepancies between sums of constituent figures and totals shown reflect rounding.
- Composite data are provided for various groups of countries organized according to economic characteristics or region. Unless noted otherwise, country group composites represent calculations based on 90 percent or more of the weighted group data.
- The boundaries, colors, denominations, and any other information shown on maps do not imply, on the part of the IMF, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

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

# PREFACE

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

The analysis in this report was coordinated in the Research Department under the general direction of Pierre-Olivier Gourinchas, Economic Counsellor and Director of Research. The project was directed by Petya Koeva Brooks, Deputy Director, Research Department, and Deniz Igan, Division Chief, Research Department. Aqib Aslam, Division Chief, Research Department and Head of the Spillovers Task Force, supervised Chapter 3.

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Gemma Rose Diaz from the Communications Department led the editorial team for the report, with production and editorial support from Michael Harrup, Lucy Scott Morales, James Unwin, MPS Limited, and Absolute Service, Inc.

The analysis has benefited from comments and suggestions by staff members from other IMF departments, as well as by Executive Directors following their discussion of the report on April 11, 2025. However, estimates, projections, and policy considerations are those of the IMF staff and should not be attributed to Executive Directors or to their national authorities.

# IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, APRIL 2025

*The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the Fiscal Monitor, Global Financial Stability Report, and World Economic Outlook on April 11, 2025.*

Executive Directors broadly agreed with staff's assessment of the global economic outlook, risks, and policy priorities. They concurred that the global economy is at a critical juncture, with significant internal and external imbalances and vulnerabilities. Directors recognized that major policy shifts are underway, generating a new wave of uncertainties with potentially significant implications for the functioning of the global economy.

Directors noted that the financial market landscape is marked by increased uncertainty and market volatility, against the backdrop of stretched valuations within many segments of financial markets. Global financial conditions have tightened, with near-term financial stability risks (as gauged by IMF's Growth-at-Risk metric) rising. Directors concurred that further correction of asset prices (with geopolitical risks being a potential trigger), the ongoing increase in leverage and interconnectedness in the financial system, especially among certain non-bank financial intermediaries (NBFIs) receiving strong investment flows in recent years, alongside still-rising sovereign debt levels, constitute key vulnerabilities keeping risks to financial stability elevated.

Directors noted that risks to the outlook are firmly tilted to the downside. They acknowledged that the escalating protectionism and elevated policy uncertainty could further reduce near- and long-term growth at a time when the world economy is entrenched in a low-growth, high-debt environment. Directors stressed that divergent and rapidly shifting policy stances or deteriorating sentiment could trigger more abrupt repricing of assets and sharp adjustments in foreign exchange rates and capital flows, especially for emerging market and developing economies. On the fiscal side, escalating uncertainty and unexpectedly high interest rates may lead to a significant increase in global public debt, particularly due to rising expenditures on defense and declining revenues linked to output uncertainty from tariffs. Furthermore, higher interest rates could limit key development spending and exacerbate financing risks in low-income developing countries, including against the background of declining official development assistance. Directors also highlighted that more limited international cooperation on common challenges could also hinder progress toward building a more resilient global economy and addressing development needs.

Directors noted that elevated uncertainty intensifies the growth-inflation trade-offs and called on central banks to carefully fine-tune monetary policy to achieve their mandates and ensure price stability. Monetary policy should remain data-dependent and clearly communicated

to anchor expectations. Where near-term inflation risks are tilted to the upside or inflation expectations are rising, future cuts to the policy rate should remain contingent on evidence that inflation is heading decisively back toward target, while ensuring that financial stability is not compromised. Central banks should stand ready to act forcefully if inflation risks materialize. Directors acknowledged that although major emerging markets have proved remarkably resilient in the face of adverse shocks, abrupt sell offs in global markets against the backdrop of potential divergence in monetary policy paths, coupled with high trade policy and economic policy uncertainty, could tighten their financial conditions and raise currency volatility. Emerging markets may thus require adoption of measures to mitigate disruptive capital outflows, and Directors recognized that the IMF's Integrated Policy Framework provides a toolkit for responses in such scenarios, tailored to country-specific circumstances.

Directors emphasized that a full, timely and consistent implementation of Basel III and other internationally agreed bank regulatory standards would ensure a level playing field across jurisdictions and guarantee ample and adequate capital and liquidity. Directors acknowledged that the growing nexus between banks and NBFIs calls for supervisors to enhance the risk assessment of such linkages. They recognized that continued buildup of debt and elevated economic uncertainty underscore the need to strengthen the macroprudential policy framework to contain excessive risk taking in the NBFIs sector, alongside ensuring capital and liquidity buffers in banking systems are adequate to support the provision of credit through periods of stress. Directors emphasized the importance of macroprudential buffers and strong crisis preparedness and resolution frameworks to mitigate shocks.

Directors called for gradual and growth-friendly fiscal adjustment within a credible medium-term framework to reduce debt, rebuild fiscal buffers, and accommodate priority spending while protecting the vulnerable. In light of emerging fiscal risks and new spending pressures, economies with limited fiscal space should reprioritize public spending within their planned budgets. Economies with room for fiscal maneuver could use some of the available space, if appropriate, within well-defined medium-term fiscal frameworks. Directors noted that advanced economies should prioritize expenditure reforms, advance pension and healthcare reforms, eliminate ineffective tax incentives, and expand tax bases by removing exemptions to improve tax expenditure efficiency. For countries facing new spending needs—for example, in defense—it is essential to demonstrate a strong commitment to upholding the integrity of the existing fiscal rules while ensuring transparency. Emerging market and developing economies should enhance revenues through tax system reforms and improved revenue administration, phase out energy subsidies, and streamline public wage bills while safeguarding public investment and upgrading social safety nets.

Directors emphasized the need for fiscal and structural reforms to enhance growth potential and the criticality of international cooperation to respond to global challenges and bolster resilience. Given significant demographic shifts, they stressed the need for comprehensive policies to increase labor force participation among women and older workers, implement pension reforms, and effectively address migration challenges. Directors recognized

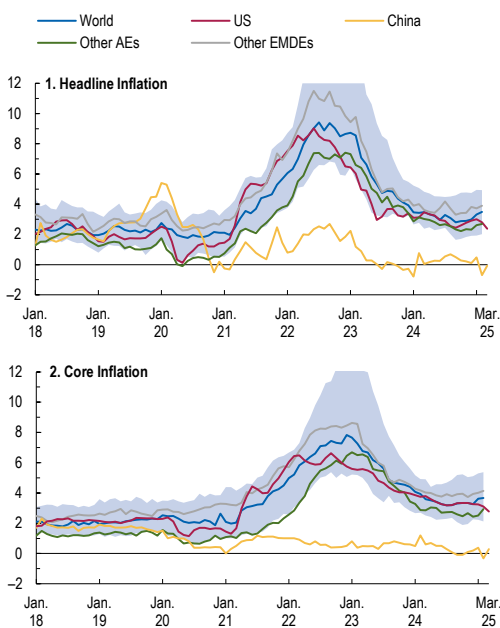
that renewable energy sources and innovative production paradigms could help countries reap the benefits of advancements in artificial intelligence without escalating electricity prices. They also highlighted that economic activity thrives under clear and transparent trade policies that stabilize expectations for businesses and consumers while minimizing volatility. Furthermore, continued cooperation across various policy areas—including trade, industrial policy, international taxation, climate, and development and humanitarian assistance—can help mitigate global spillovers and protect vulnerable populations.

# GLOBAL PROSPECTS AND POLICIES

## Policy Uncertainty Tests Global Resilience

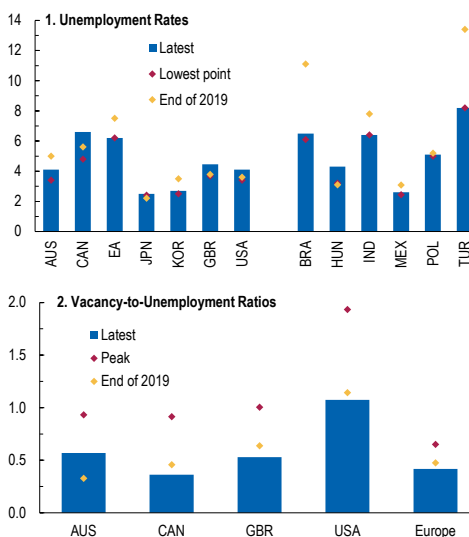
The global economy is at a critical juncture. Signs of stabilization were emerging through much of 2024, after a prolonged and challenging period of unprecedented shocks. Inflation, down from multidecade highs, followed a gradual though bumpy decline toward central bank targets (Figure 1.1). Labor markets normalized, with unemployment and vacancy rates returning to prepandemic levels (Figure 1.2). Growth hovered around 3 percent in the past few years, and global output came close to potential (Figure 1.3).

**Figure 1.1. Global Inflation Trends**  
(Percent, year over year)



Sources: Haver Analytics; and IMF staff calculations.  
Note: Panels 1 and 2 plot the median of a sample of 57 economies that accounts for 78 percent of *World Economic Outlook* world GDP (in weighted purchasing-power-parity terms) in 2024. Vertical axes are cut off at -2 percent and 12 percent. The bands depict the 25th to 75th percentiles of data across economies. "Core inflation" is the percent change in the consumer price index for goods and services, excluding food and energy (or the closest available measure). AEs = advanced economies; EMDEs = emerging market and developing economies.

**Figure 1.2. Labor Markets**  
(Percent)



Sources: Haver Analytics; India Ministry of Statistics and Programme Implementation, Periodic Labour Force Survey; International Labour Organization; Organisation for Economic Co-operation and Development; US Bureau of Economic Analysis; US Bureau of Labor Statistics; and IMF staff calculations.  
Note: In panel 1, India's unemployment in urban areas is from Periodic Labour Force Survey data. The "lowest point" is from the period spanning March 2019 to the latest available data. In panel 2, "Europe" includes Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, and Sweden. The "peak" is from the period spanning January 2020 to the latest available data. Data labels in the figure use International Organization for Standardization (ISO) country codes. EA = euro area.

However, major policy shifts are resetting the global trade system and giving rise to uncertainty that is once again testing the resilience of the global economy. Since February, the United States has announced multiple waves of tariffs against trading partners, some of which have invoked countermeasures. Markets first took the announcements mostly in stride, until the United States' near-universal application of tariffs on April 2, which triggered historic drops in major equity indices and spikes in bond yields, followed by a partial recovery after the pause and additional carve-outs announced on and after April 9. Despite significant equity market corrections in early March and April, price-to-earnings ratios in the United States remain at elevated levels in historical context, raising concerns about the potential for further disorderly corrections (April

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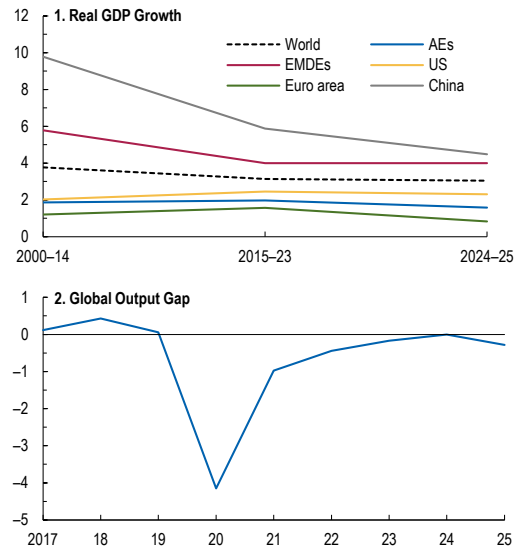
2025 *Global Financial Stability Report* [GFSR]).

Uncertainty, especially that regarding trade policy, has surged to unprecedented levels (Figure 1.4). The degree of the surge varies across countries, depending on exposures to protectionist measures through trade and financial linkages as well as broader geopolitical relationships.

These developments come against an already-cooling economic momentum. Recent data on real activity have been disappointing, with GDP growth in the fourth quarter of 2024 trailing the forecasts in the January 2025 *World Economic Outlook* (WEO) *Update*. High-frequency indicators such as retail sales and purchasing managers' surveys point to slowing growth. In the United States, consumer, business, and investor sentiment was optimistic at the beginning of the year but has recently shifted to a notably more pessimistic stance as uncertainty has taken hold and new tariffs have been announced. In labor markets, hiring has slowed in many countries, and layoffs have risen. Meanwhile, progress on disinflation has mostly stalled, and inflation has edged upward in some cases, with an increasing number of countries exceeding their inflation targets. Services inflation, though still on a downward trend, remains above levels prior to the inflation surge, and core goods inflation has seen an uptick since November 2024. Trade has held up, but this is mostly because of an increase in Chinese exports and US imports at the end of 2024, with consumers and businesses likely front-loading ahead of tariffs that were anticipated back then and now are in place.

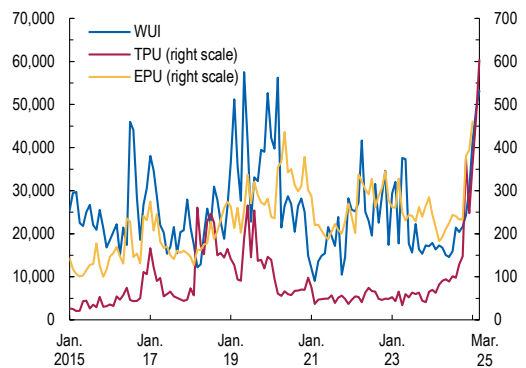
In the backdrop, domestic imbalances and policy gaps give rise to unbalanced growth while opening up potential fragilities. In some countries, such as China, growth in 2024 has been mainly supported by external demand. On the contrary, in the United States, private consumption—traditionally the major contributor to GDP growth—as a share of GDP has reached its highest point during the 2020s, and the fiscal deficit remains historically large. Within-country inequalities in households' income gains signal another potential vulnerability. In

**Figure 1.3. Growth Performance and Forecasts (Percent)**



Source: IMF staff calculations.  
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

**Figure 1.4. Overall Uncertainty, EPU, and TPU (Index)**



Sources: Ahir, Bloom, and Furceri 2022; Caldara and others 2020; Davis 2016; and IMF staff calculations.  
Note: The uncertainty measures are news- and media-outlets-based indices that quantify media attention to global news related to overall uncertainty (WUI), economic policy uncertainty (EPU), and trade policy uncertainty (TPU).

some cases, real GDP has recovered, but real GDP per capita has not (Figure 1.5, panel 1). In others, median income has fallen behind, whereas incomes at the top and bottom of the distribution have recovered. Meanwhile, salient indicators of the cost of living, such as house prices and rents, have increased substantially (Figure 1.5, panel 2).

### Varying Momentum across Countries

The stable performance of the global economy in the past couple of years hides important differences across countries. These differences are the result of diverse shocks, structural characteristics, and policy actions. They manifest themselves in varying cyclical positions and structural forces determining the outlook.

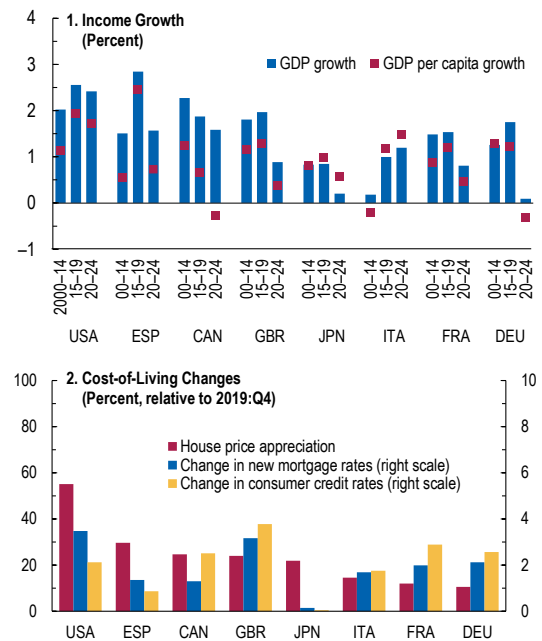
### Cyclical Positions

Most countries are not fully back to their inflation targets yet, but output gaps are more dispersed (Figure 1.6, panel 1). In quite a few cases, fiscal policy remains accommodative even as monetary policy maintains a restrictive stance (Figure 1.6, panel 2).

The US economy was operating above its potential in 2024, relying heavily on strong domestic demand. Private consumption grew at an annual rate of 2.8 percent in 2024, in excess of its 2.4 percent historical (2000–19) average. However, in 2025, signs of a potential reversal have emerged. Consumer spending declined by 0.6 percent in January and remained subdued in February after expanding by 0.6 percent in December 2024, with the decrease likely reflecting a normalization of private consumption toward more sustainable levels and the negative impact of recurring policy shifts on economic sentiment. This signals a deterioration of the cyclical position of the US economy.

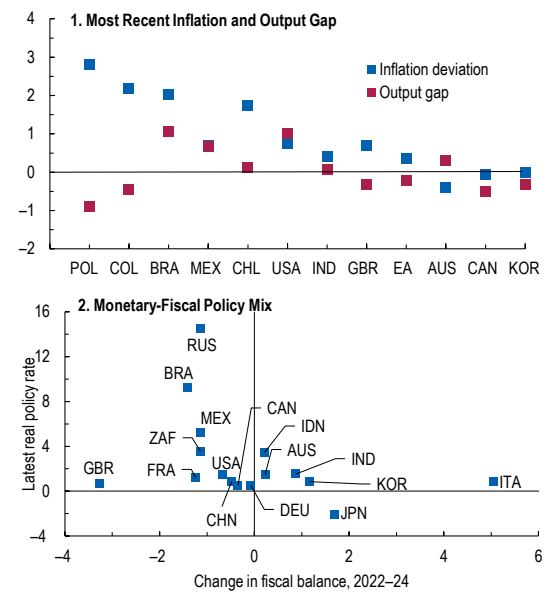
The euro area has been in a cyclical rebound, but domestic demand has been subdued and, with the exception of Germany, the contribution of consumption growth may have peaked in its largest economies. Weak consumer sentiment and elevated

Figure 1.5. Income Growth and Cost-of-Living Changes



Sources: Haver Analytics; Organisation for Economic Co-operation and Development; and IMF staff calculations.  
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

Figure 1.6. Cyclical Positions (Percent)



Sources: Haver Analytics; and IMF staff estimates.  
Note: In panel 1, the inflation deviation is defined as the difference between 2025:Q1 inflation and the central bank's inflation target. The output gap is the 2024 output gap. In panel 2, the fiscal balance refers to the general government structural primary balance in percent of potential GDP. The structural primary balance is the cyclically adjusted balance excluding net interest payments and corrected for a broader range of noncyclical factors such as changes in asset and commodity prices. Rolling 12-month ahead inflation expectations are used for the calculation of the real policy rate. The sample includes G20 economies excluding Argentina, Saudi Arabia, and Türkiye, owing to lack of data availability. Data labels in the figure use International Organization for Standardization (ISO) country codes. EA = euro area.

uncertainty have raised precautionary saving while weighing down consumption growth (October 2024 *Regional Economic Outlook: Europe*). Manufacturing activity has remained weak on the back of persistently higher energy prices, while services have been the main growth driver, contributing to divergence among European countries, particularly those relying more heavily on these sectors, notably Germany versus Spain.

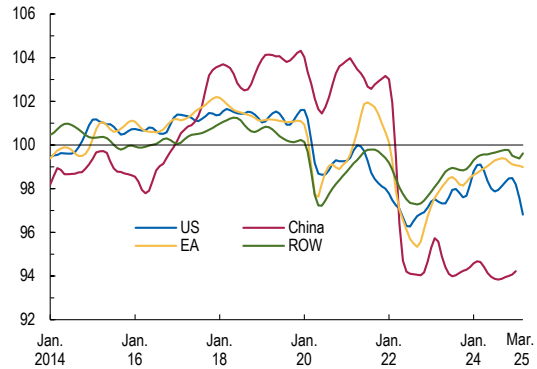
For China, prolonged weakness in the real estate sector and its ramifications, including those for local government finances, have been key. When the pandemic seized the Chinese economy, signs of a downturn in the credit-fueled property market were gathering. This homegrown vulnerability has depressed domestic demand, even as policymakers have searched for measures to tackle property market oversupply and bolster confidence. Indeed, consumer confidence in China, after a decade of moving closely with that in the rest of the world, plunged in early 2022 and has not recovered (Figure 1.7). Rising trade tensions and new tariffs over the past years have also disproportionately affected the Chinese economy. The rebalancing of growth drivers from investment and net exports toward consumption has paused amid continuing deflationary pressures and high household saving. Construction and real estate activity remains subdued, whereas industry, trade, and transport have been robust.

**Structural Forces**

The varying momentum also owes to the interaction of cyclical and structural factors. The cross-country differences in growth rates would be expected to narrow as the cyclical forces dissipate but may not disappear.

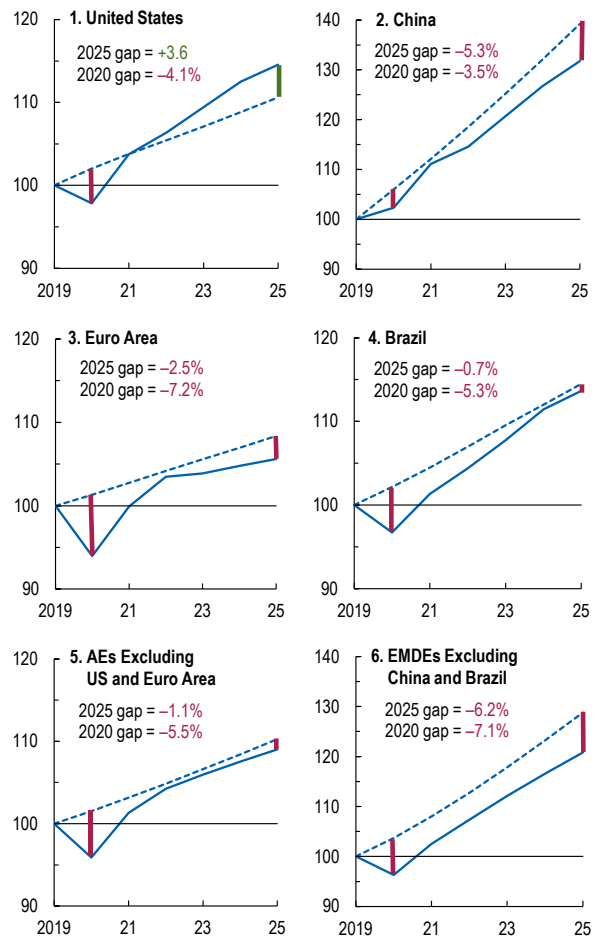
Compared with the GDP level implied by the prepandemic trend, most economies have made up for some of the damage done by the pandemic (Figure 1.8). The United States has

**Figure 1.7. Consumer Confidence**  
(Index, OECD harmonized)



Sources: OECD; and IMF staff calculations.  
Note: The rest of world (ROW) represents the average value for data across 22 countries. EA = euro area; OECD = Organisation for Economic Co-operation and Development.

**Figure 1.8. Real GDP versus Prepandemic Trend**  
(Index, 2019 = 100)



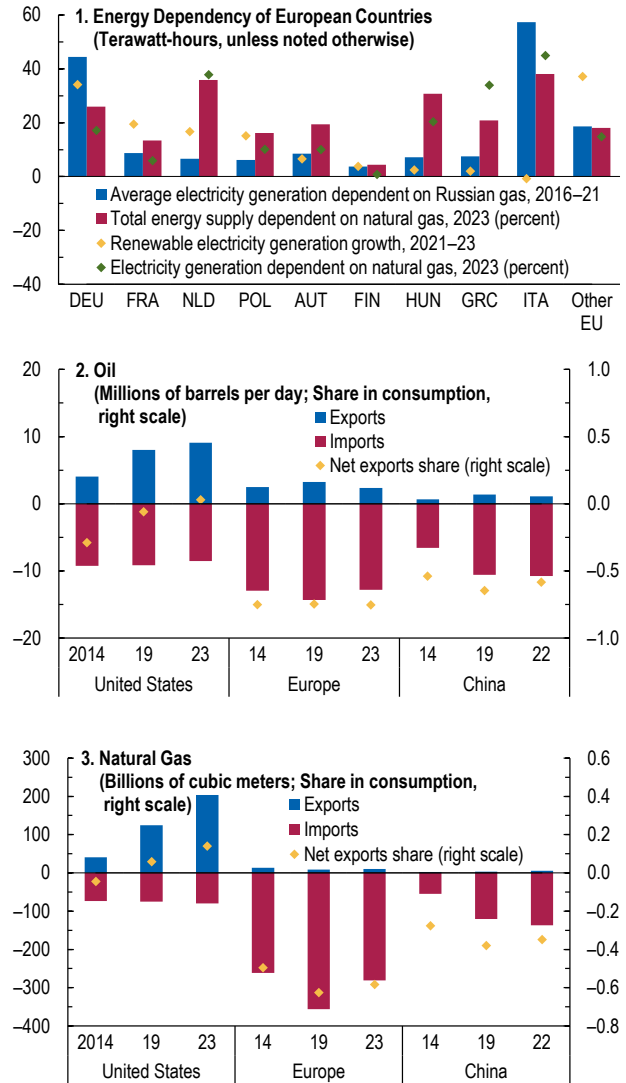
Source: IMF staff calculations.  
Note: Solid-line data are from April 2025 *World Economic Outlook* (WEO). Dashed lines denote prepandemic trend based on January 2020 WEO Update. AEs = advanced economies; EMDEs = emerging market and developing economies.

been an outlier, but generally, scarring has been less pronounced than initially thought, speaking to the surprising resilience of the global economy (April 2024 WEO). Still, there are several cases in which output is still falling behind the prepandemic trend.

A big part of the story behind the scarring is the energy shock. European economies, including major manufacturing hubs such as Germany and Italy, were particularly exposed to the disruption of natural gas markets following Russia’s invasion of Ukraine (Figure 1.9, panel 1). As oil and natural gas prices soared, countries shifted their energy sources and increased efficiency in their energy consumption. There are limits to such strategies, however, because substitution of energy sources may be difficult, and many countries remain dependent on oil and natural gas imports for their energy use (Figure 1.9, panels 2 and 3). Crucially, this shock had a twofold effect on commodity importers as the dollar strengthened, with the US terms of trade improving amid heightened uncertainty (*External Stability Report 2024*). Because commodity prices are expressed in dollars, the stagflationary pressures on commodity importers have become stronger. Similar dynamics apply to global food markets, with the effects felt especially in low-income countries. By contrast, the United States not only was already less dependent on energy imports but had also transitioned from being a net energy importer to a net energy exporter. This shift has partly insulated the US economy from the commodity market disruptions caused by the war.

Labor productivity growth has declined in recent years in nearly every country besides the United States (Figure 1.10, panel 1). The relative strength in US labor productivity growth in part reflects stronger investment (Figure 1.10, panel 2). Capital shallowing because of chronic investment weakness can explain roughly half of the productivity growth slowdown in advanced economies since 2010 and about a third of that in emerging market and developing economies (Fernald and Li 2023; Igan and others

Figure 1.9. Shifts in Energy Imports and Exports



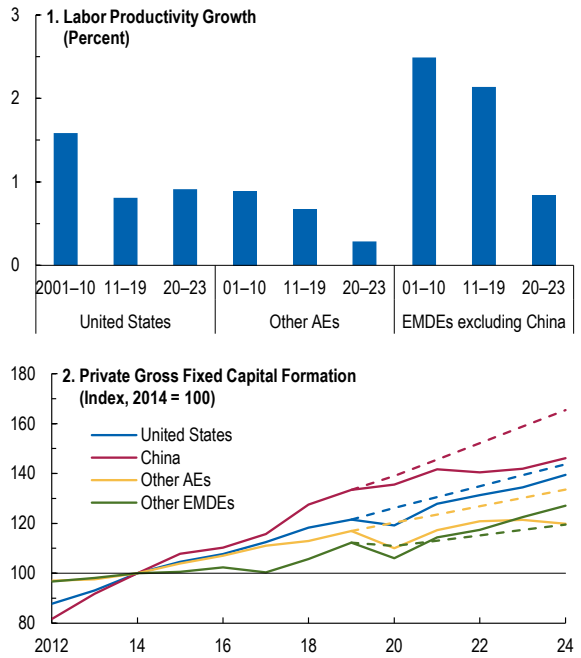
Sources: Energy Institute; International Energy Agency; and IMF staff calculations. Note: In panel 1, data labels use International Organization for Standardization (ISO) country codes. "Other EU" refers to the remaining European Union (EU) countries. In panel 2, oil trade includes both crude oil and oil products. In panels 2 and 3, "Europe" includes European members of the Organisation for Economic Co-operation and Development plus Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Gibraltar, Latvia, Lithuania, Malta, Montenegro, North Macedonia, Romania, and Serbia. Intra-European trade is excluded from "Europe" values.

2024). Greater labor market flexibility may have also played a role in how productivity growth has evolved since the pandemic. The rate of job-to-job transitions explains a large share of productivity growth in the United States since 2020 (Dao and Platzer 2024). By contrast, countries where furlough programs were introduced have typically experienced slower productivity growth. Although these programs are designed to preserve skill matches and prevent skill-diluting unemployment spells, thereby enhancing medium-term productivity, their effectiveness may be compromised by additional factors. The war-related energy shock, coupled with the persistent nature of these disruptions, could adversely affect productivity by obstructing the necessary reallocation of resources across different sectors of the economy. More generally, traditionally higher job market churn in the United States relative to that in Europe has likely allowed workers to make job-to-job transitions more easily.

The productivity growth discrepancies have a counterpart in how manufacturing activity continues to shift away from advanced economies to emerging market economies. Industrial production plunged in all countries at the onset of the pandemic (Figure 1.11). The recovery paths, however, have been decisively different. Production has soared in China and has also expanded in smaller EU economies and the ASEAN-5 (Indonesia, Malaysia, the Philippines, Singapore, Thailand), whereas it has struggled to get back to prepandemic levels in Japan and the largest EU countries. Industrial production in the United States has made it back up and performed better there than in advanced economy peers.

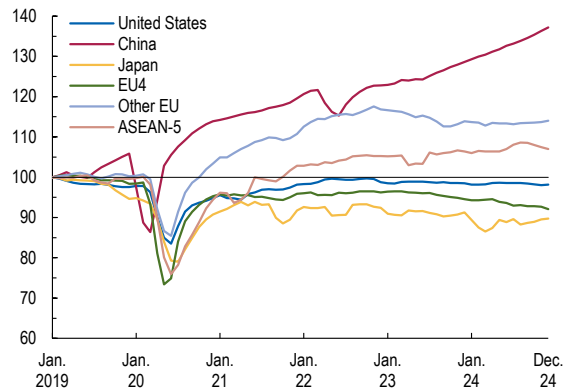
Adding to the manufacturing headwinds in some economies are demographic headwinds. Countries around the world are progressively crossing their demographic turning points—when the share of the working-age population starts declining—with direct implications for labor supply and productivity (see Chapter 2). Germany, Italy, and Japan are ahead of others with

Figure 1.10. Labor Productivity and Capital Investment



Source: IMF staff calculations. Note: In panel 1, labor productivity is calculated on a per-worker basis. In panel 2, dashed lines denote the 2014–19 trend. AEs = advanced economies; EMDEs = emerging market and developing economies.

Figure 1.11. Industrial Production Trends (Index, Jan. 2019 = 100)



Sources: United Nations Industrial Development Organization; and IMF staff calculations. Note: Figure data are calculated as three-month moving averages. "EU4" refers to France, Germany, Italy, and Spain. "Other EU" refers to all other European Union (EU) countries. ASEAN-5 = Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

declining shares of working-age population, as is China, while the United States is not too far behind those countries, but strong flows of immigrants with quick adaptation to labor markets have shielded its economy more than other economies.

### Diminished Policy Space

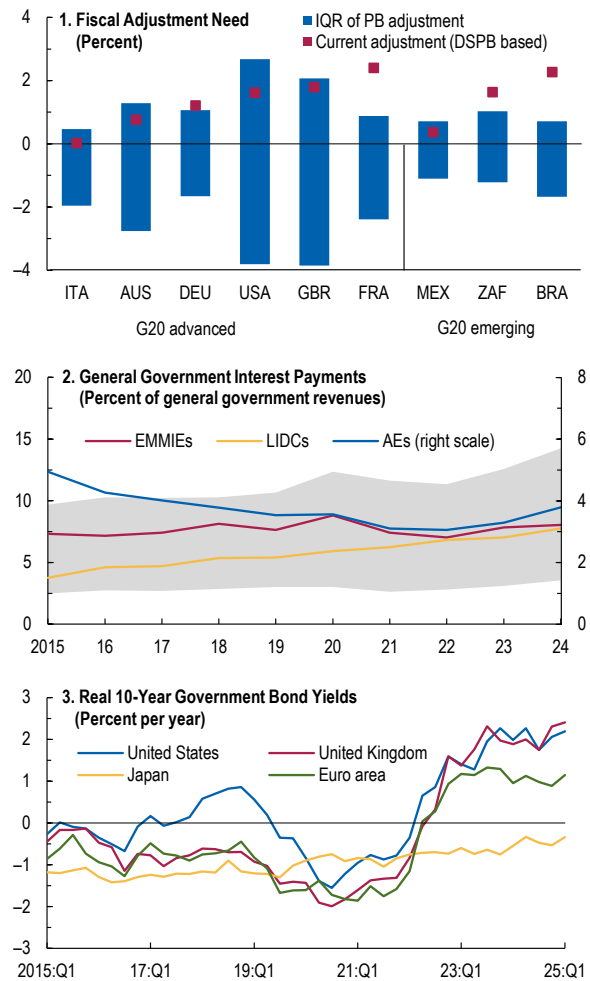
Crucially, much of the available policy space has already been exhausted in many countries (April 2020, April 2021, and October 2022 WEO reports), limiting how much support policymakers can give economies in case of new negative shocks or a pronounced downturn. Many countries passed large fiscal support packages, first during the pandemic and then as energy and food prices spiked at the onset of Russia’s invasion of Ukraine. Fiscal policy was expected to pivot somewhat toward consolidation; however, on account of recent geopolitical developments, some regions are now poised to pursue fiscal expansion. After the pandemic, the decisive and forceful monetary policy response brought inflation down to near central bank targets at relatively little cost to economic activity (see Chapter 2 of the October 2024 WEO). The hard-earned credibility of central banks played an important role by limiting de-anchoring of inflation expectations. But the legacies, in the form of high public debt levels and increased scrutiny of central bank decisions, remain.

### High Public Debt amid Elevated Interest Rates

Fiscal support during the pandemic and at the onset of the war in Ukraine in response to spiking energy and food prices supported the recovery. But fiscal measures sharply increased debt-to-GDP ratios. Despite some reductions that have occurred and additional cuts being planned, budget deficits remain large and cast a shadow on the outlook. Fiscal space is now much tighter than a decade ago, and the fiscal adjustment required to stabilize debt ratios is at a historic high (Figure 1.12, panel 1).

At the same time, debt service as a fraction of fiscal revenue is rising (Figure 1.12, panel 2). The heterogeneous increase reflects cross-

Figure 1.12. Fiscal Policy Space



Sources: Consensus Economics; Organisation for Economic Co-operation and Development; and IMF staff calculations.  
 Note: Panel 1 shows current three-year adjustment need versus historical adjustment. IQR refers to the interquartile range of three-year primary balance (PB) adjustments over the period 2000–19, calculated as the change between years  $t + 3$  and  $t$  using a rolling window. Current adjustment need is based on the difference between the 2028 debt-stabilizing primary balance (DSPB) and the 2025 primary balance excluding other flows. In panel 2, lines show medians, and shaded area denotes the IQR over all countries. Panel 3 shows real rates calculated using long-term inflation expectations from Consensus Forecasts. Data labels in the figure use International Organization for Standardization (ISO) country codes. AEs = advanced economies; EMMIEs = emerging market and middle-income economies; G20 = Group of Twenty; LIDCs = low-income developing countries.

country divergence in fiscal policy stances, growth and inflation patterns, and debt maturity structures, with relatively larger reliance on short-term debt in some cases. Although servicing costs remain below pandemic levels in countries where debt was incurred under favorable conditions during COVID-19, effective rates are likely to surpass prepandemic levels as debt rolls over, notably those for low-income countries and some emerging market and developing economies.

After more than a decade of very low interest rates in advanced economies, real long-term government bond yields have been on the rise (Figure 1.12, panel 3), surging significantly in recent months. Higher long-term rates, initially driven by monetary policy tightening, are persisting even as the monetary policy cycle has turned, owing to a global rise in term premiums. In the United States, a combination of increased issuances, higher expected inflation, and risk premiums compounded the rise in term premiums until mid-January, when long-term interest rates moderated. The recent tariff announcements pushed them back up again.

**Inflation Expectations on Edge after Inflation Score**

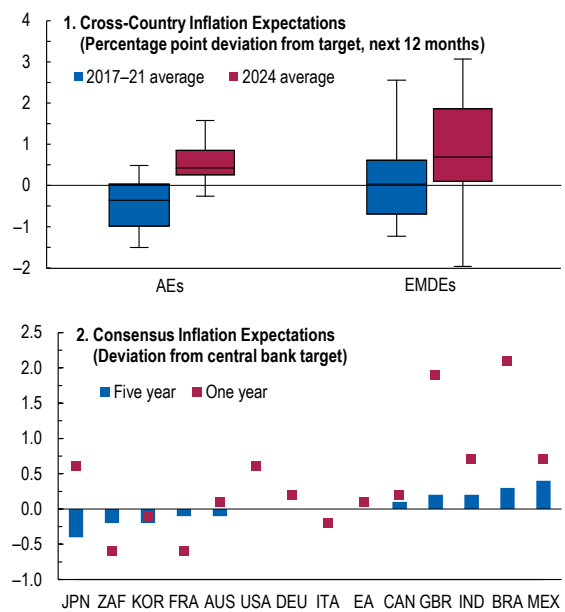
Inflation expectations now exceed central bank targets in most advanced economies as well as emerging market and developing economies, whereas their group averages between 2017 and 2021 were at or below target (Figure 1.13). Yields remain sensitive to inflation surprises and diminishing fiscal space (April 2025 GFSR). In economies already operating at or close to potential and facing potential inflationary pressures, including those from new trade policies and exchange rate movements, there is less leeway for central banks to “look through” new negative supply shocks.

**Global Imbalances Arising from Domestic Imbalances**

Rising geopolitical tensions and widening domestic imbalances—in particular, weak demand in China and strong demand in the United States—have renewed concerns about global imbalances (Gourinchas and others 2024). Other nonmarket policies and state interventions could also contribute to external imbalances.

The volume of international trade in percent of world GDP has been broadly stable, but structural changes have been taking place nonetheless. Overall, increasingly more trade has been occurring within countries historically aligned with each other rather than between them (October 2024 WEO). Moreover, since 2016–17, China and the United States have diversified their bases of trading partners, decoupling from each other in terms of export and import

Figure 1.13. Inflation Deviation from Target



Sources: Central bank websites; Consensus Economics; Haver Analytics; and IMF staff calculations. Note: In panel 1, sample includes 30 advanced economies (AEs) and 31 emerging market and developing economies (EMDEs). The horizontal lines in the middle of the boxes show the medians, and the upper (lower) limits of the boxes show the third (first) quartiles. The whiskers show the maximum and minimum within a boundary of 1.5 times the interquartile range from the upper and lower quartiles, respectively. In panel 2, “one year” is based on March 2025 data. Data labels use International Organization for Standardization (ISO) country codes. EA = euro area.

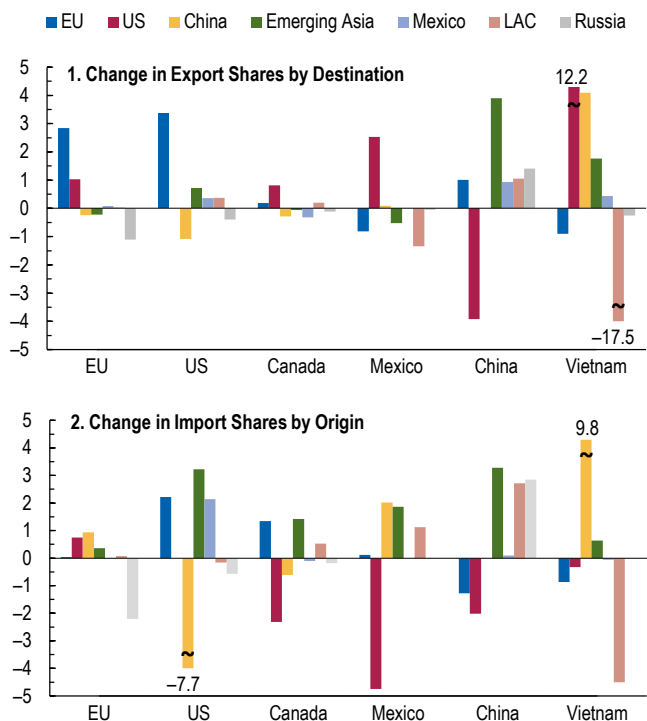
linkages (Figure 1.14). In some cases, this diversification has happened at a microeconomic level along the supply chain through trade rerouting and production reallocation, such as that which has taken place among emerging markets in Asia, with an increasing share of import origination for the United States and as import as well as export counterparts for China. In addition, a distinct macroeconomic dimension of trade reallocation has emerged. For example, shifting demand patterns have led Europe to import more from China in general, and from the United States in the energy sector. At the same time, Europe is exporting more to the United States in other sectors. As a result, Europe’s trade exposure to both China and the United States has increased.

Global current account balances—the sums of absolute surpluses and deficits—have declined from their 2022 peaks. But they remain larger than the averages observed just before the pandemic (see “The Outlook: A Range of Possibilities” section). The deficit in the United States is larger than it was in the late 2010s.

Imbalances are also becoming visible in net international investment positions. The net asset position of US residents—US holdings of foreign securities minus foreign holdings of US securities—resumed its downward trend in 2023 after increasing briefly in 2022 (April 2025 GFSR). The decline is attributable not only to US equity prices increasing more than foreign equity prices but also to rising foreign purchases of US bonds during this period. Recent years have also seen a concentration of foreign direct investment (FDI) flows toward the United States (Figure 1.15, panel 1).

The dollar appreciated sharply in the run-up to the US elections in November 2024, with markets expecting higher US growth and tighter monetary policy. However, since February 2025, the dollar has lost all the gains it achieved in the last quarter of 2024 (Figure 1.15, panel 2), on the back of weaker US growth prospects and uncertainty. Initial depreciation pressures were particularly pronounced for the currencies of emerging market and developing economies, but they have dissipated following the softening in 2025 (Figure 1.15, panel 3). Since April 2, global risk appetite has declined substantially, with the risk-off environment inducing an offset to the appreciation of emerging market currencies.

**Figure 1.14. Changes in Trade Composition**  
(Percentage points, change in trade shares, 2023–24 minus 2016–17)



Sources: IMF, Direction of Trade Statistics; and IMF staff calculations.  
Note: “Emerging Asia” excludes China and “LAC” excludes Mexico. EMDE = emerging market and developing economy; EU = European Union; LAC = Latin America and the Caribbean.

## The Outlook: A Range of Possibilities

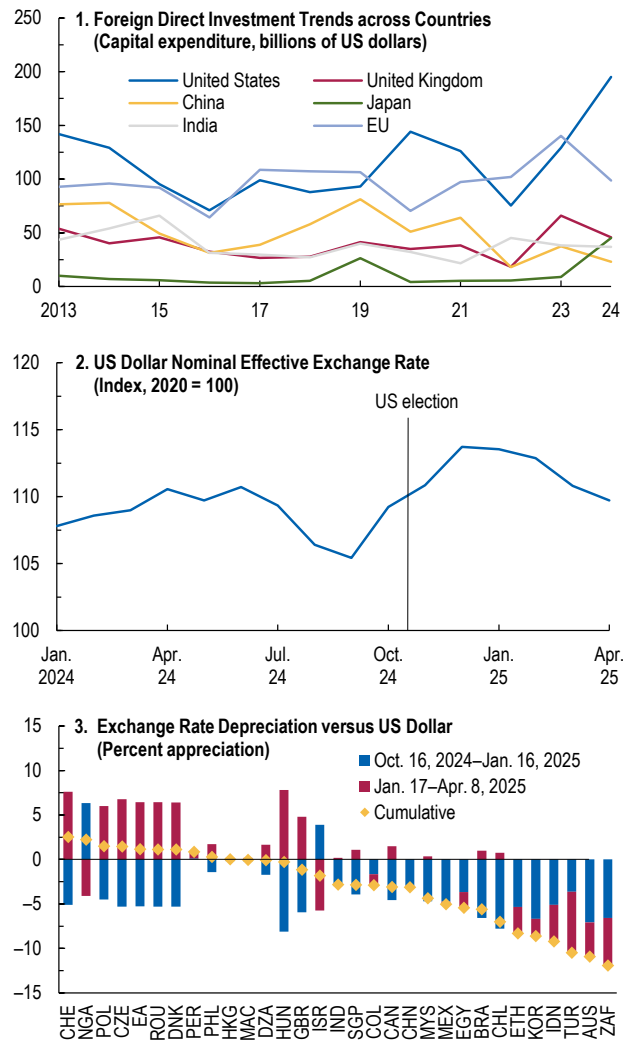
The swift escalation of trade tensions has generated extremely high levels of policy ambiguity, making it more difficult than usual to establish a central global growth outlook. Therefore, this WEO presents a range of global growth projections. First is a “reference forecast” based on measures announced as of April 4. This is what is presented in the tables of this report and the WEO database. Second, a *pre-April 2 forecast* (with a cutoff date of late March) incorporates all prior policy announcements and economic developments since the October 2024 WEO. Third, a *post-April 9 model-based forecast* is used to quantify the implications of the announced pause and associated additional exemptions, as well as the escalating tariff rates between China and the United States.

### Global Assumptions

The reference forecast is predicated on several projections for global commodity prices, interest rates, and fiscal policies (Figure 1.16). Acknowledging the high level of prevailing uncertainty, Box 1.1 presents scenarios involving additional trade, fiscal, and structural policies as well as other plausible shocks.

- Commodity price projections:* Prices of fuel commodities are projected to decrease in 2025 by 7.9 percent, with a 15.5 percent decline in oil prices and a 15.8 percent drop in coal prices offset by a 22.8 percent increase in natural gas prices, the latter driven up by colder-than-expected weather and the halt of Russian gas flow to Europe through Ukraine since January 1. Nonfuel commodity prices are projected to increase by 4.4 percent in 2025. Projected food and beverage prices have been revised upward compared with those in the January 2025 WEO *Update*.
- Monetary policy projections:* The Federal Reserve and the European Central Bank are expected to continue to reduce interest rates in the coming quarters, albeit at different paces from

Figure 1.15. Capital Flows and Exchange Rates

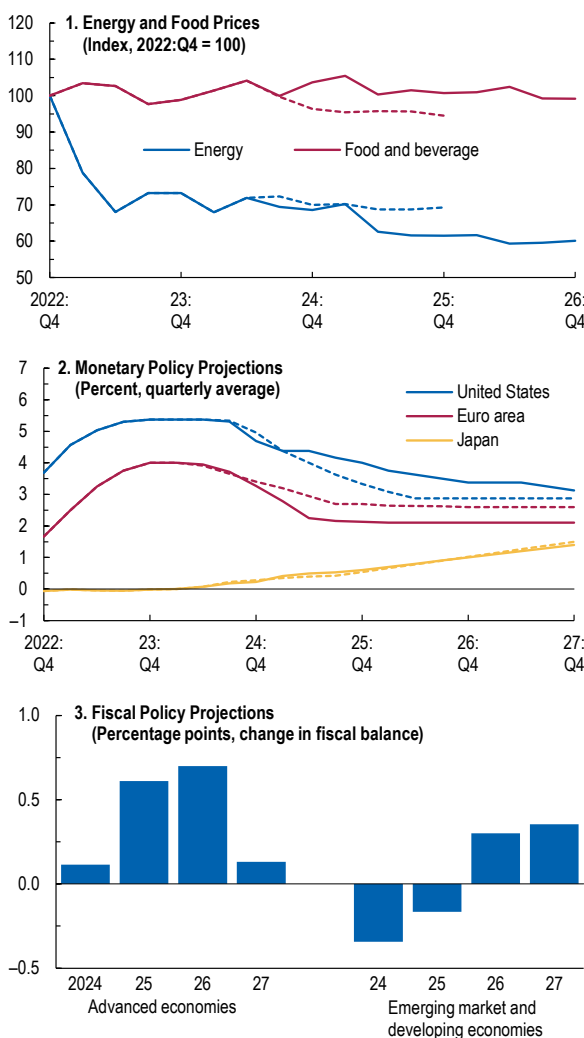


Sources: Bank for International Settlements; Haver Analytics; Orbis Crossborder Investment; and IMF staff calculations.  
 Note: Panel 1 shows capital expenditure on new and expansion inward foreign direct investment projects that have been announced, completed, or postponed by destination country. Intra-EU investment is excluded for EU values. In panel 2, exchange rates are based on end-of-month data, with April data up to April 8, 2025. An increase indicates appreciation. In panel 3, percentage appreciation is computed as the difference in log exchange rates. Data labels in the figure use International Organization for Standardization (ISO) country codes. EA = euro area; EU = European Union.

one another. In the United States, the federal funds rate is projected to be down to 4 percent at the end of 2025 and reach its long-term equilibrium of 2.9 percent at the end of 2028. In the euro area, 100 basis points in cuts are expected in 2025 (with three cuts having already occurred this year), representing two more 25 basis point cuts than in the assumptions underlying the October 2024 WEO, bringing the policy rate to 2 percent by the middle of the year. In Japan, policy rates are expected to be lifted at a similar pace as assumed in October 2024, gradually rising over the medium term toward a neutral setting of about 1.5 percent, consistent with keeping inflation and inflation expectations anchored at the Bank of Japan’s 2 percent target.

- Fiscal policy projections:* Governments in advanced economies on average are expected to tighten fiscal policy in 2025–26 and, to a lesser extent, in 2027. The general government structural-fiscal-balance-to-GDP ratio is expected to improve by 1 percentage point in the United States in 2025. Yet it is worth noting that under current policies, US public debt fails to stabilize, rising from 121 percent of GDP in 2024 to 130 percent of GDP in 2030. These projections do not incorporate measures that remain under discussion at the time of publication, notably, the net expansionary US budget resolution (currently, most provisions under the Tax Cuts and Jobs Act are assumed to expire at the end of 2025). In the euro area, under the reference forecast, the primary deficit in Germany is expected to widen by about 1 percent of GDP by 2030 relative to 2024 and by about 4 percent of GDP relative to the January WEO forecast for 2030, with the increase driven primarily by higher defense spending and public investment, and this is assumed to generate spillovers to France, Italy, and Spain. The euro area debt-to-GDP ratio is expected to increase from its current 88 percent to 93 percent in 2030, although there is significant uncertainty surrounding the assessment of the economic impact of the additional fiscal spending. In emerging market and developing economies, primary fiscal deficits are

Figure 1.16. Global Assumptions



Source: IMF staff calculations.  
 Note: In panels 1 and 2, solid lines denote projections from the April 2025 *World Economic Outlook* (WEO) and dashed lines those from the October 2024 WEO. In panel 3, the fiscal balance used is the general government structural primary balance in percent of potential GDP. The structural primary balance is the cyclically adjusted primary balance excluding net interest payments and corrected for a broader range of noncyclical factors such as changes in asset and commodity prices.

## WORLD ECONOMIC OUTLOOK

projected to widen in 2025 by 0.3 percentage point on average, followed by fiscal tightening starting in 2026. In China, the structural-fiscal-balance-to-GDP ratio is expected to deteriorate by 1.2 percentage points in 2025. Public debt in emerging market and developing economies continues to rise from its current level of 70 percent of GDP, reaching a projected 83 percent in 2030.

- *Trade policy assumptions:*

- Tariff announcements between February 1 and April 4, with specific details on their implementation, are included in the reference forecast. On February 1, executive orders signed by US President Donald J. Trump imposed tariffs on Canada, China, and Mexico. An additional tariff of 10 percent on all imports from China came into effect on February 4, and another 10 percent was imposed on March 4. China responded with tariffs of 10 to 15 percent on imports of select US agricultural products, energy commodities, and farm equipment, which took effect on February 10, and on imports of agricultural products, which took effect on March 10. Tariffs of 25 percent on all nonenergy goods imports from Canada (for energy, 10 percent) and of 25 percent on all imports from Mexico took effect on March 4, with the exemption of goods compliant with the United States–Mexico–Canada Agreement (USMCA). Canada announced 25 percent countertariffs on roughly 40 percent of Canadian imports of goods from the United States. Mexico indicated the intention to respond without specifying the measures to be employed, hence the reference forecast includes no additional tariff imposed on Mexican imports from the United States. The United States also expanded tariffs on steel and aluminum, effective March 12, removing all exemptions to the 25 percent tariff on steel imports and increasing the tariff rate on aluminum from 10 to 25 percent. On March 26, the United States announced a 25 percent tariff on all automobiles and auto parts, excluding US content in auto and auto parts exports. This tariff came into effect on April 3 for autos, while implementation for auto parts was postponed to May 3. The US Fair and Reciprocal Plan was introduced on April 2, imposing a 10 percent minimum tariff on all countries other than Canada and Mexico and country-specific rates as high as 50 percent for roughly 60 countries. The universal 10 percent minimum tariff took effect on April 5, and the other tariffs were set to take effect on April 9. Exemptions applied to categories of goods deemed critical, such as pharmaceuticals, semiconductors, energy, and certain minerals. Countermeasures from Canada, announced on April 3, consisted of 25 percent tariffs on non-USMCA-compliant fully assembled vehicles imported from the United States. On April 4, China announced 34 percent tariffs, matching the increase in US duties on imports from China, to take effect on April 10.
- Under the reference forecast, trade policy uncertainty is assumed to remain elevated through 2025 and 2026. The perceived unpredictability of the current trade landscape is evident from the significant spike in the daily trade policy indicator (Caldara and others 2020), which surged more than four standard deviations in just three days after April 2, despite the disclosure of the details of the expected tariffs.

### Growth Forecast

#### **Global Growth: Reference Forecast and Alternatives**

In the near term, under the reference forecast, global growth is projected to fall from an estimated 3.3 percent in 2024 to 2.8 percent in 2025, before recovering to 3 percent in 2026. This is lower than the projections in the January 2025 WEO *Update*, by 0.5 percentage point for 2025 and 0.3 percentage point for 2026, with downward revisions for nearly all countries (Tables 1.1 and 1.2). The downgrades are broad-based across countries and reflect in large part the direct effects of the new trade measures and their indirect effects through trade linkage spillovers, heightened uncertainty, and deteriorating sentiment. As indicated in the illustrative model simulations presented in Box 1.2, the growth impact of tariffs in the short term varies across countries, depending on trade relationships, industry compositions, policy responses, and opportunities for trade diversification. Fiscal support in some cases (for example, China, euro area) offsets some of the negative growth impact.

Given uncertainty over where trade policy could settle, the two alternative growth outlooks are as follows:

- Under the *pre-April 2 forecast*, global growth would be 3.2 percent for both 2025 and 2026, lower by 0.1 percentage point in each year compared with the January 2025 WEO *Update*. This forecast deviates from the global assumptions listed above on trade policy announcements, the level of uncertainty, and commodity prices. It is predicated on higher oil prices and only those trade policies announced between February 1 and March 12, namely, tariffs on Canada and Mexico, the first wave of tariffs on China, associated responses by Canada and China, and sectoral tariffs on steel and aluminum. The downgrades to growth under this outlook are largest for the countries directly involved, but growth in other economies is also lower because of increased uncertainty relative to that in January and tariff-related spillovers.

# WORLD ECONOMIC OUTLOOK

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

	2024	Projections		Difference from January 2025 WEO Update <sup>1</sup>		Difference from October 2024 WEO <sup>1</sup>	
		2025	2026	2025	2026	2025	2026
<b>World Output</b>	<b>3.3</b>	<b>2.8</b>	<b>3.0</b>	<b>-0.5</b>	<b>-0.3</b>	<b>-0.4</b>	<b>-0.3</b>
<b>Advanced Economies</b>	<b>1.8</b>	<b>1.4</b>	<b>1.5</b>	<b>-0.5</b>	<b>-0.3</b>	<b>-0.4</b>	<b>-0.3</b>
United States	2.8	1.8	1.7	-0.9	-0.4	-0.4	-0.3
Euro Area	0.9	0.8	1.2	-0.2	-0.2	-0.4	-0.3
Germany	-0.2	0.0	0.9	-0.3	-0.2	-0.8	-0.5
France	1.1	0.6	1.0	-0.2	-0.1	-0.5	-0.3
Italy	0.7	0.4	0.8	-0.3	-0.1	-0.4	0.1
Spain	3.2	2.5	1.8	0.2	0.0	0.4	0.0
Japan	0.1	0.6	0.6	-0.5	-0.2	-0.5	-0.2
United Kingdom	1.1	1.1	1.4	-0.5	-0.1	-0.4	-0.1
Canada	1.5	1.4	1.6	-0.6	-0.4	-1.0	-0.4
Other Advanced Economies <sup>2</sup>	2.2	1.8	2.0	-0.3	-0.3	-0.4	-0.3
<b>Emerging Market and Developing Economies</b>	<b>4.3</b>	<b>3.7</b>	<b>3.9</b>	<b>-0.5</b>	<b>-0.4</b>	<b>-0.5</b>	<b>-0.3</b>
Emerging and Developing Asia	5.3	4.5	4.6	-0.6	-0.5	-0.5	-0.3
China	5.0	4.0	4.0	-0.6	-0.5	-0.5	-0.1
India <sup>3</sup>	6.5	6.2	6.3	-0.3	-0.2	-0.3	-0.2
Emerging and Developing Europe	3.4	2.1	2.1	-0.1	-0.3	-0.1	-0.4
Russia	4.1	1.5	0.9	0.1	-0.3	0.2	-0.3
Latin America and the Caribbean	2.4	2.0	2.4	-0.5	-0.3	-0.5	-0.3
Brazil	3.4	2.0	2.0	-0.2	-0.2	-0.2	-0.3
Mexico	1.5	-0.3	1.4	-1.7	-0.6	-1.6	-0.6
Middle East and Central Asia	2.4	3.0	3.5	-0.6	-0.4	-0.9	-0.7
Saudi Arabia	1.3	3.0	3.7	-0.3	-0.4	-1.6	-0.7
Sub-Saharan Africa	4.0	3.8	4.2	-0.4	0.0	-0.4	-0.2
Nigeria	3.4	3.0	2.7	-0.2	-0.3	-0.2	-0.3
South Africa	0.6	1.0	1.3	-0.5	-0.3	-0.5	-0.2
<i>Memorandum</i>							
World Growth Based on Market Exchange Rates	2.8	2.3	2.4	-0.6	-0.4	-0.5	-0.3
European Union	1.1	1.2	1.5	-0.2	-0.2	-0.4	-0.2
ASEAN-5 <sup>4</sup>	4.6	4.0	3.9	-0.6	-0.6	-0.5	-0.6
Middle East and North Africa	1.8	2.6	3.4	-0.9	-0.5	-1.4	-0.8
Emerging Market and Middle-Income Economies	4.3	3.7	3.8	-0.5	-0.4	-0.5	-0.3
Low-Income Developing Countries	4.0	4.2	5.2	-0.4	-0.2	-0.5	-0.4
<b>World Trade Volume (goods and services)</b>	<b>3.8</b>	<b>1.7</b>	<b>2.5</b>	<b>-1.5</b>	<b>-0.8</b>	<b>-1.7</b>	<b>-0.9</b>
Imports							
Advanced Economies	2.4	1.9	2.0	-0.3	-0.4	-0.5	-0.5
Emerging Market and Developing Economies	5.8	2.0	3.4	-3.0	-1.1	-2.9	-1.2
Exports							
Advanced Economies	2.1	1.2	2.0	-0.9	-0.6	-1.5	-1.0
Emerging Market and Developing Economies	6.7	1.6	3.0	-3.4	-1.7	-3.0	-1.3
<b>Commodity Prices (US dollars)</b>							
Oil <sup>5</sup>	-1.8	-15.5	-6.8	-3.8	-4.2	-5.1	-3.2
Nonfuel (average based on world commodity import weights)	3.7	4.4	0.2	1.9	0.3	4.6	-0.6
<b>World Consumer Prices <sup>6</sup></b>	<b>5.7</b>	<b>4.3</b>	<b>3.6</b>	<b>0.1</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>
Advanced Economies <sup>7</sup>	2.6	2.5	2.2	0.4	0.2	0.5	0.2
Emerging Market and Developing Economies <sup>6</sup>	7.7	5.5	4.6	-0.1	0.1	-0.4	-0.1

## CHAPTER 1 GLOBAL PROSPECTS AND POLICIES

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

	Q4 over Q4 <sup>8</sup>						
	2024	Projections		Difference from January 2025 WEO Update <sup>1</sup>		Difference from October 2024 WEO <sup>1</sup>	
		2025	2026	2025	2026	2025	2026
<b>World Output</b>	<b>3.5</b>	<b>2.4</b>	<b>3.0</b>	<b>-0.8</b>	<b>-0.1</b>	<b>-0.7</b>	...
<b>Advanced Economies</b>	<b>1.9</b>	<b>1.2</b>	<b>1.5</b>	<b>-0.7</b>	<b>-0.2</b>	<b>-0.5</b>	...
United States	2.5	1.5	1.7	-0.9	-0.4	-0.4	...
Euro Area	1.2	0.7	1.4	-0.5	0.0	-0.6	...
Germany	-0.2	0.3	1.0	-0.5	0.1	-1.0	...
France	0.6	0.8	1.0	-0.2	-0.2	-0.7	...
Italy	0.6	0.8	0.9	-0.2	0.2	0.2	...
Spain	3.4	2.0	1.7	0.1	-0.3	0.0	...
Japan	1.2	-0.4	1.3	-1.2	0.6	-0.6	...
United Kingdom	1.5	1.7	0.9	-0.1	-0.4	0.6	...
Canada	2.4	0.6	2.2	-1.5	0.3	-1.5	...
Other Advanced Economies <sup>2</sup>	1.9	2.2	1.7	-0.6	0.0	-0.4	...
<b>Emerging Market and Developing Economies</b>	<b>4.8</b>	<b>3.3</b>	<b>4.0</b>	<b>-0.9</b>	<b>-0.2</b>	<b>-1.0</b>	...
Emerging and Developing Asia	5.8	4.0	4.7	-0.9	-0.4	-1.0	...
China	5.4	3.2	4.2	-1.3	-0.3	-1.5	...
India <sup>3</sup>	7.5	6.2	6.3	-0.3	-0.2	-0.3	...
Emerging and Developing Europe	3.0	1.8	2.0	-1.1	0.4	-0.9	...
Russia	3.7	0.4	0.8	-0.8	-0.4	-0.8	...
Latin America and the Caribbean	2.3	1.6	2.8	-1.1	0.4	-1.3	...
Brazil	3.3	2.0	2.2	-0.1	-0.1	-0.2	...
Mexico	0.5	-0.2	2.0	-1.6	-0.1	-1.6	...
Middle East and Central Asia	...	...	...	...	...	...	...
Saudi Arabia	4.5	2.5	3.7	1.3	-0.4	-2.1	...
Sub-Saharan Africa	...	...	...	...	...	...	...
Nigeria	3.5	3.7	2.8	0.0	-1.0	0.0	...
South Africa	0.8	0.8	1.6	0.2	-0.6	-0.2	...
<i>Memorandum</i>							
World Growth Based on Market Exchange Rates	3.0	1.9	2.5	-0.8	-0.1	-0.7	...
European Union	1.5	1.1	1.7	-0.4	0.0	-0.3	...
ASEAN-5 <sup>4</sup>	4.7	3.6	4.3	-0.3	-0.7	0.6	...
Middle East and North Africa	...	...	...	...	...	...	...
Emerging Market and Middle-Income Economies	4.8	3.3	4.0	-0.9	-0.2	-1.0	...
Low-Income Developing Countries	...	...	...	...	...	...	...
<b>Commodity Prices (US dollars)</b>							
Oil <sup>5</sup>	-10.1	-14.1	-0.7	-9.1	1.5	-9.2	...
Nonfuel (average based on world commodity import weights)	8.3	1.2	0.4	1.1	-0.1	0.7	...
<b>World Consumer Prices <sup>6</sup></b>	<b>4.8</b>	<b>3.5</b>	<b>3.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	...
Advanced Economies <sup>7</sup>	2.4	2.4	2.1	0.3	0.1	0.4	...
Emerging Market and Developing Economies <sup>8</sup>	6.7	4.4	3.6	-0.2	-0.2	-0.3	...

Source: IMF staff estimates.

Note: See Box A2 of the Statistical Appendix for a list of economies whose projections have been revised based on developments in commodity markets and international trade as of April 4, 2025. Real effective exchange rates are assumed to remain constant at the levels prevailing during March 6, 2025–April 3, 2025. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. WEO = *World Economic Outlook*.

<sup>1</sup> Difference based on rounded figures for the current, January 2025 WEO Update, and October 2024 WEO forecasts.

<sup>2</sup> Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

<sup>3</sup> For India, data and forecasts are presented on a fiscal year basis, and GDP from 2011 onward is based on GDP at market prices with fiscal year 2011/12 as a base year.

<sup>4</sup> Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

<sup>5</sup> Simple average of prices of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average price of oil in US dollars a barrel was \$79.17 in 2024; the assumed price, based on futures markets, is \$66.94 in 2025 and \$62.38 in 2026.

<sup>6</sup> Excludes Venezuela. See the country-specific note for Venezuela in the "Country Notes" section of the Statistical Appendix.

<sup>7</sup> The assumed inflation rates for 2025 and 2026, respectively, are as follows: 2.1 percent and 1.9 percent for the euro area, 2.4 percent and 1.7 percent for Japan, and 3.0 percent and 2.5 percent for the United States.

<sup>8</sup> For world output, the quarterly estimates and projections account for approximately 90 percent of annual world output at purchasing-power-parity weights. For emerging market and developing economies, the quarterly estimates and projections account for approximately 85 percent of annual emerging market and developing economies' output at purchasing-power-parity weights.

## WORLD ECONOMIC OUTLOOK

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

	2024	Projections		Difference from January 2025 WEO Update <sup>1</sup>		Difference from October 2024 WEO <sup>1</sup>	
		2025	2026	2025	2026	2025	2026
<b>World Output</b>	<b>2.8</b>	<b>2.3</b>	<b>2.4</b>	<b>-0.6</b>	<b>-0.4</b>	<b>-0.5</b>	<b>-0.3</b>
<b>Advanced Economies</b>	<b>1.8</b>	<b>1.4</b>	<b>1.5</b>	<b>-0.6</b>	<b>-0.3</b>	<b>-0.4</b>	<b>-0.3</b>
<b>Emerging Market and Developing Economies</b>	<b>4.1</b>	<b>3.5</b>	<b>3.7</b>	<b>-0.6</b>	<b>-0.4</b>	<b>-0.6</b>	<b>-0.3</b>
Emerging and Developing Asia	5.2	4.3	4.4	-0.6	-0.5	-0.5	-0.2
Emerging and Developing Europe	3.3	2.1	2.3	-0.2	-0.2	-0.2	-0.3
Latin America and the Caribbean	2.2	1.9	2.2	-0.6	-0.4	-0.5	-0.4
Middle East and Central Asia	2.0	2.9	3.6	-0.8	-0.4	-1.1	-0.5
Sub-Saharan Africa	3.7	3.7	4.2	-0.4	0.0	-0.4	-0.1
<i>Memorandum</i>							
European Union	1.0	1.0	1.4	-0.3	-0.2	-0.5	-0.3
Middle East and North Africa	1.6	2.7	3.5	-0.9	-0.5	-1.3	-0.7
Emerging Market and Middle-Income Economies	4.2	3.5	3.6	-0.6	-0.5	-0.5	-0.3
Low-Income Developing Countries	3.9	4.2	5.3	-0.5	-0.2	-0.6	-0.4

Source: IMF staff estimates.

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

<sup>1</sup> Difference based on rounded figures for the current, January 2025 WEO Update, and October 2024 WEO forecasts.

- The *post-April 9 model-based forecast* incorporates the tariff announcements made after April 4 and, hence, not included in the reference forecast.
  - On April 9, the United States announced a 90-day pause on the higher tariff rates imposed on some countries but maintained the 10 percent minimum on all countries while further raising tariffs on Chinese goods as a countermeasure to China's tariff response, which China then countered again. The EU responded with 25 percent tariffs on a range of US imports, which were also paused for 90 days. On April 11, the United States announced that it would exempt smartphones, laptops, and other electronic devices and components from the April 2 tariffs, while China raised tariffs on US goods further, with the higher rate taking effect on April 12. As of April 14—the cutoff date for data and information used in this chapter—the US effective tariff rate on Chinese goods was 115 percent, while that imposed by China on US goods was 146 percent, and the US effective tariff rate on the world stood at about 25 percent, up from under 3 percent in January 2025.
  - If the measures announced between April 5 and 14 were considered in isolation from the associated market fallout and policy-induced uncertainty and assumed to be permanent, global growth for 2025 would be about 2.8 percent for 2025 and about 2.9 percent for 2026. This is similar to the estimates for global growth in the reference forecast, albeit with a different composition of growth rates across countries. The gains from lower effective tariff rates for those countries that were previously subject to higher tariffs would now be offset by poorer growth outcomes in China and the United States—due to the escalating tariff rates—that would propagate through global supply chains. Further, the losses in China and the United States would become larger in 2026 and beyond, while the gains in other regions would fade, leading to weaker global outcomes than the reference forecast.

### **Growth Forecast for Advanced Economies**

For *advanced economies*, growth under the reference forecast is projected to drop from an estimated 1.8 percent in 2024 to 1.4 percent in 2025 and 1.5 percent in 2026. Growth for 2025 is now projected to be 0.5 percentage point lower relative to that in January 2025 WEO *Update* projections. The forecasts for 2025 include significant downward revisions for Canada, Japan, the United Kingdom, and the United States and an upward revision for Spain.

- For the *United States*, growth is projected to decrease in 2025 to 1.8 percent, 1 percentage point lower than the rate for 2024 as well as 0.9 percentage point lower than the forecast rate in the January 2025 WEO *Update*. The downward revision is a result of greater policy uncertainty, trade tensions, and a softer demand outlook, given slower-than-anticipated consumption growth. Tariffs are also expected to weigh on growth in 2026, which is projected at 1.7 percent amid moderate private consumption.
- Growth in the *euro area* is expected to decline slightly to 0.8 percent in 2025, before picking up modestly to 1.2 percent in 2026. Rising uncertainty and tariffs are key drivers of the subdued growth in 2025. Offsetting forces that support the modest pickup in 2026 include stronger consumption on the back of rising real wages and a projected fiscal easing in *Germany* following major changes to its fiscal rule (the “debt brake”). Within the region, *Spain*’s momentum contrasts with the sluggish dynamics elsewhere. The growth projection for 2025 for Spain is 2.5 percent, an upward revision of 0.2 percentage point from that in the January 2025 WEO *Update*. This reflects a large carryover from better-than-expected outturns in 2024 and reconstruction activity following floods.
- Among other advanced economies, several downward revisions stand out. For *Canada*, growth forecasts are revised downward by 0.6 percentage point for 2025 and by 0.4 percentage point for 2026. This largely reflects the new tariffs on exports to the United States that came into effect in March as well as heightened uncertainty and geopolitical tensions. For *Japan*, the growth projection for 2025 is 0.6 percent, marking a downgrade of 0.5 percentage point relative to the forecast in January. The effect of tariffs announced on April 2 and associated uncertainty offset the expected strengthening of private consumption, with above-inflation wage growth boosting household disposable income. For the *United Kingdom*, the growth projection for 2025 is 1.1 percent, lower by 0.5 percentage point compared to the forecast in January. This reflects a smaller carryover from 2024, the impact of recent tariff announcements, an increase in gilt yields, and weaker private consumption amid higher inflation as a result of regulated prices and energy costs.

### **Growth Forecast for Emerging Market and Developing Economies**

For *emerging market and developing economies*, growth under the reference forecast is projected to drop to 3.7 percent in 2025 and 3.9 percent in 2026, following an estimated 4.3 percent in 2024. This is 0.5 and 0.4 percentage point lower, respectively, compared with the rate projected in the January 2025 WEO *Update*.

- After a marked slowdown in 2024, growth in *emerging and developing Asia* is expected to decline further to 4.5 percent in 2025 and 4.6 percent in 2026. Emerging and developing Asia,

## WORLD ECONOMIC OUTLOOK

particularly Association of Southeast Asian Nations (ASEAN) countries, has been among the most affected by the April tariffs. For *China*, 2025 GDP growth is revised downward to 4.0 percent from 4.6 percent in the January 2025 WEO *Update*. This reflects the impact of recently implemented tariffs, which offset the stronger carryover from 2024 (as a result of a stronger-than-expected fourth quarter) and fiscal expansion in the budget. Growth in 2026 is also revised downward to 4.0 percent from 4.5 percent in the January 2025 WEO *Update* on the back of prolonged trade policy uncertainty and the tariffs now in place. For *India*, the growth outlook is relatively more stable at 6.2 percent in 2025, supported by private consumption, particularly in rural areas, but this rate is 0.3 percentage point lower than that in the January 2025 WEO *Update* on account of higher levels of trade tensions and global uncertainty.

- For *Latin America and the Caribbean*, growth is projected to moderate from 2.4 percent in 2024 to 2.0 percent in 2025, before rebounding to 2.4 percent in 2026. The forecasts are revised downward by 0.5 percentage point for 2025 and 0.3 percentage point in 2026 compared with those in the January 2025 WEO *Update*. The revisions owe largely to a significant downgrade to growth in Mexico, by 1.7 percentage points for 2025 and 0.6 percentage point for 2026, reflecting weaker-than-expected activity in late 2024 and early 2025 as well as the impact of tariffs imposed by the United States, the associated uncertainty and geopolitical tensions, and a tightening of financing conditions.
- Growth in *emerging and developing Europe* is projected to slow down considerably, from 3.4 percent in 2024 to 2.1 percent in 2025 and 2026. This reflects a sharp drop in growth in *Russia* from 4.1 percent in 2024 to 1.5 percent in 2025 and to 0.9 percent in 2026 as private consumption and investment decelerate amid reduced tightness in the labor market and slower wage growth. Compared with that projected in the January 2025 WEO *Update*, growth in Russia has been revised slightly upward for 2025 thanks to stronger-than-expected outturns in the data for 2024. For *Türkiye*, growth is projected to bottom out in 2025 at 2.7 percent and accelerate to 3.2 percent in 2026, owing to recent pivots in monetary policy.
- The *Middle East and Central Asia* is projected to come out of several years of subdued growth, with the rate accelerating from an estimated 2.4 percent in 2024 to 3.0 percent in 2025 and to 3.5 percent in 2026 as the effects of disruptions to oil production and shipping dissipate and the impact of ongoing conflicts lessens. Compared with that in January, the projection is revised downward, reflecting a more gradual resumption of oil production, persistent spillovers from conflicts, and slower-than-expected progress on structural reforms.
- For *sub-Saharan Africa*, growth is expected to decline slightly from 4 percent in 2024 to 3.8 percent in 2025 and recover modestly in 2026, lifting to 4.2 percent. Among the larger economies, the growth forecast in *Nigeria* is revised downward by 0.2 percentage point for 2025 and 0.3 percentage point for 2026, owing to lower oil prices, and that in *South Africa* is revised downward by 0.5 percentage point for 2025 and 0.3 percentage point for 2026, reflecting slowing momentum from a weaker-than-expected 2024 outturn, deteriorating sentiment due to heightened uncertainty, the intensification of protectionist policies, and a deeper slowdown in major economies. *South Sudan* has a downward revision of 31.5

percentage points for 2025 on account of the delay in the resumption of oil production from a damaged pipeline.

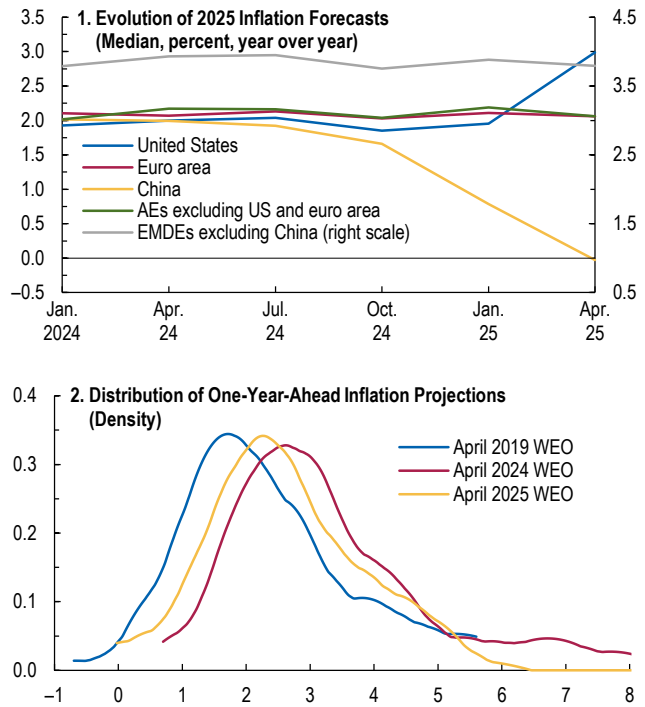
**Inflation Forecast**

Under the reference forecast, global headline inflation is expected to decline to 4.3 percent in 2025 and to 3.6 percent in 2026. Inflation is projected to converge back to target earlier in advanced economies, reaching 2.2 percent in 2026, compared with emerging market and developing economies, for which it declines to 4.6 percent over the same time horizon. Compared with that in the January 2025 WEO *Update*, the global inflation forecast is slightly higher for 2025.

For advanced economies, the inflation forecast for 2025 has been revised upward by 0.4 percentage point since January. The United Kingdom and the United States stand out in both the direction and the magnitude of their revisions. Compared with those in the January 2025 WEO *Update*, the UK inflation forecast has been revised upward by 0.7 percentage point and the US forecast by 1.0 percentage point. For the United States, this reflects stubborn price dynamics in the services sector as well as a recent uptick in the growth of the price of core goods (excluding food and energy) and the supply shock from recent tariffs. In the United Kingdom, it primarily reflects one-off regulated price changes. In the euro area, the forecast is unchanged.

Among emerging market and developing economies, the revisions are mixed. In emerging and developing Asia, inflationary pressures are expected to be even more muted, with a downward revision of 0.5 percentage point to 2025 forecasts relative to those in January. After a series of downward surprises, inflation in China is expected to remain subdued (Figure 1.17, panel 1). In emerging and developing Europe, Russia and Ukraine have seen upward revisions for 2025, and Russia for 2026, driving overall revisions of 1.5 percentage points in 2025 and 1.0 percentage point in 2026. In Latin America and the Caribbean, upward revisions for Bolivia, Brazil, and Venezuela have been offset by downward revisions for Argentina and elsewhere, bringing the overall revision for the region for 2025 to -0.3 percentage point.

**Figure 1.17. Inflation Forecasts**



Source: IMF staff calculations.  
 Note: In panel 1, the x-axis shows the months the *World Economic Outlook* (WEO) is published. Panel 2 displays the distribution of one-year-ahead year-over-year inflation projections from the WEO reports using estimated kernel densities. The panel shows the 50 largest economies excluding Argentina, Bangladesh, Egypt, Iran, Nigeria, Pakistan, Türkiye, and Ukraine. AEs = advanced economies; EMDEs = emerging market and developing economies.

## WORLD ECONOMIC OUTLOOK

The inflation outlook as a whole has improved but has not yet fully returned to prepandemic patterns (Figure 1.17, panel 2), and it is subject to high uncertainty. In particular, the effects of recently imposed tariffs on inflation across countries will depend on whether the tariffs are perceived to be temporary or permanent, the extent to which firms adjust margins to offset increased import costs, and whether imports are invoiced in US dollars or local currency (see Box 1.2). Cross-country implications will differ too. Trade tariffs act as a supply shock on tariffing countries, reducing productivity and increasing unit costs. Tariffed countries face a negative demand shock as export demand diminishes, exerting downward pressure on prices. In both cases, trade uncertainty adds a layer of demand shock as businesses and households respond by postponing investment and spending, and this effect may be amplified by tighter financial conditions and increased exchange rate volatility.

### Medium-Term Outlook

Lacking structural reform momentum and facing headwinds from a range of challenges, global economic performance is expected to remain mediocre. The five-year-ahead growth forecast stands at 3.2 percent, below the historical average during 2000–19 of 3.7 percent. For many emerging market and developing economies, as well as for quite a few advanced economies, current medium-term growth forecasts fall short of those made in 2020 (Figure 1.18). The fact that the moderation of medium-term growth is more evident among emerging market and developing economies implies a slowdown in income convergence (Chapter 3 of the April 2024 WEO).

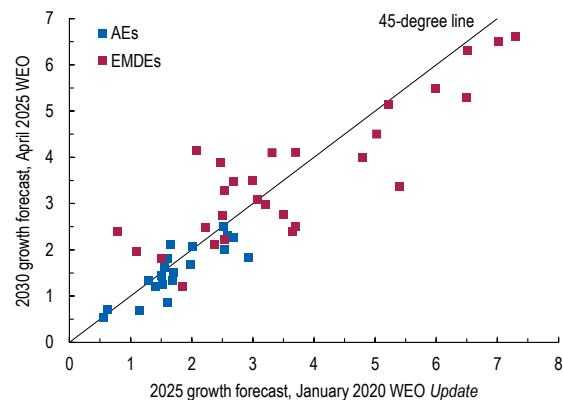
A key and increasingly common driver of these sluggish medium-term growth dynamics is demographics. Population aging is expected to weigh significantly on productivity, labor force participation, and ultimately, growth (Chapter 2). Population movements across borders could help alleviate some of the demographic drag, and policies governing these movements can have complex spillovers onto growth (Chapter 3).

### World Trade Outlook

Global trade growth is expected to slow down in 2025 to 1.7 percentage point, a downward revision of 1.5 percentage point since the January 2025 WEO *Update*. This forecast reflects increased tariff restrictions affecting trade flows and, to a lesser extent, the waning effects of cyclical factors that have underpinned the recent rise in goods trade.

Meanwhile, global current account balances are expected to narrow somewhat (Figure 1.19). The widening of current account balances in 2024 reflected widening domestic imbalances and a pickup in global goods trade. Over the medium term, global balances are expected to narrow

**Figure 1.18. Medium-Term Outlook**  
(Percent)



Source: IMF staff calculations.

Note: Figure plots 50 largest economies (21 AEs and 29 EMDEs) in terms of 2024 GDP in purchasing-power-parity international dollars. AEs = advanced economies; EMDEs = emerging market and developing economies; WEO = *World Economic Outlook*.

gradually as the effects of these factors wane. Creditor and debtor stock positions are estimated to have increased in 2024, with the increases reflecting widening current account balances. They are expected to moderate slightly over the medium term as current account balances gradually narrow. In some economies, gross external liabilities remain large from a historical perspective and pose risks of external stress.

### Risks to the Outlook: Tilted to the Downside

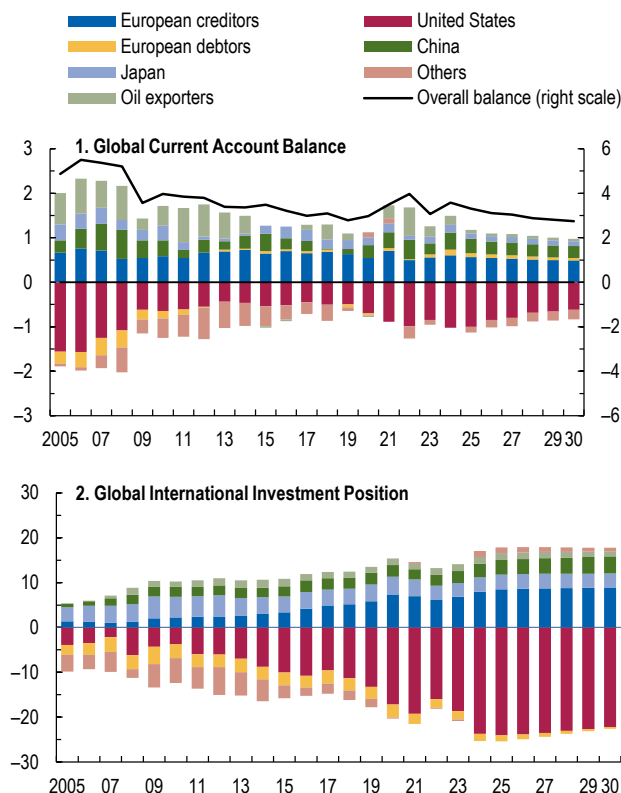
Overall, risks to the outlook are tilted to the downside, in both the short and the medium term. This section discusses the most prominent risks and uncertainties surrounding the outlook in detail. Box 1.1 presents model-based analysis that quantifies risks to the global outlook and plausible scenarios.

#### Downside Risks

Although some risks outlined in the January 2025 WEO *Update* have materialized and are now incorporated in the reference forecast, the likelihood of additional adverse risks being realized is increasing.

**Escalating trade measures and prolonged trade policy uncertainty:** Box 1.1 illustrates the impact of ratcheting up a trade war. World GDP would be negatively affected, though the magnitude of the effect would vary across countries. Those directly targeted by new tariffs would be most affected, notably China and the United States, but also a large set of countries in Asia and Europe in the medium term. Some countries may harness the opportunity to consolidate their trade networks, reconfigure their position in global value chains, and, hence, experience positive effects, especially if traded goods embed a rising share of domestic value added, as seen in the case of Vietnam in 2018 (Schulze and Xin, forthcoming). However, adverse effects could accumulate over time. Their magnitude would depend on how quickly countries can boost domestic consumption, reroute trade flows, and increase productivity and competitiveness, as well as on the reach and intensity of the countermeasures, including nontariff measures. The emergence of new trading clusters is likely to fragment FDI flows and weigh on capital accumulation (see Chapter 4 of the April 2024 WEO). Rising geopolitical tensions could open up the possibility of sudden changes in the international monetary system,

**Figure 1.19. Current Account and International Investment Positions**  
(Percent of global GDP)



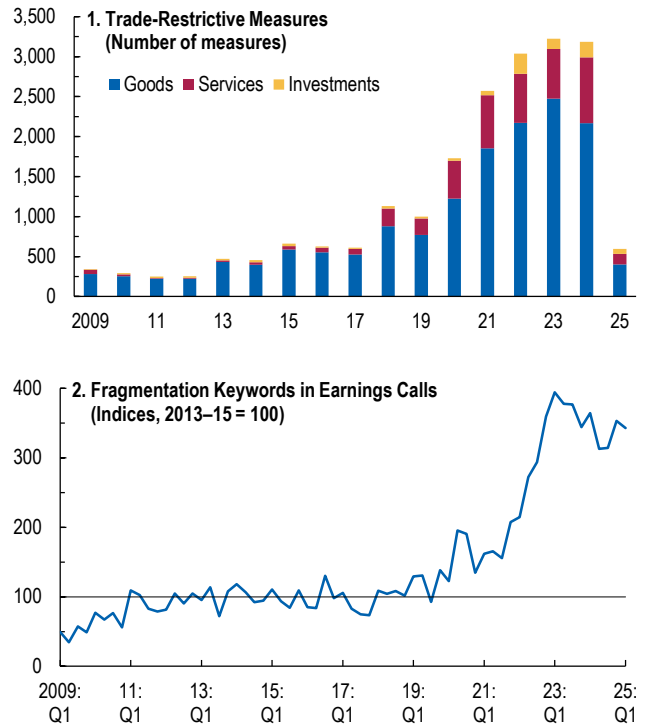
Source: IMF staff calculations.  
Note: "European creditors" are Austria, Belgium, Denmark, Finland, Germany, Italy, Luxembourg, The Netherlands, Norway, Sweden, and Switzerland; "European debtors" are Cyprus, Greece, Ireland, Portugal, Slovenia, and Spain; "oil exporters" are Algeria, Azerbaijan, Iran,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

with potential implications for macrofinancial stability. A reversal of global economic integration might also trigger suboptimal relocation of production units and technological decoupling, with negative growth effects in the longer term because of resource misallocation, loss of knowledge hubs, contraction in bank credit, and financial stability risks (Aiyar and others 2023; Campos and others 2023; Gopinath and others 2024; Chapter 2 of the April 2025 GFSR).

A trade war could also fuel inflationary pressures, primarily through rising import prices (Fajgelbaum and Khandelwal 2022). Although the simulations in Box 1.1 indicate rather moderate effects, several factors could lead to higher inflationary pressures in some countries. First, with more than 80 percent of trade invoicing in US dollars, additional pressure may arise if the US dollar appreciates, as observed during previous episodes of trade uncertainty and financial market volatility. Second, inflation expectations are currently higher than central bank targets and, in some cases, on the rise. Third, restrictions on commodities may lead to significant price shifts, particularly since price elasticities of critical minerals and highly traded agricultural goods are especially vulnerable to trade fragmentation because of their concentrated production, difficulties in substitution, and essential roles in manufacturing and key technologies (see Chapter 3 of the October 2023 WEO). Price increases are also likely to have negative distributional effects across and within countries. Tariffs on agricultural commodities could raise food security concerns, particularly in low-income countries. Tariffs tend to raise prices of tradables, on which poor households spend relatively more (Cravino and Levchenko 2017; Carroll and Hur 2020), and may increase returns to capital over labor, benefiting the wealthy. Welfare losses are typically concentrated among the poor and the retired, even when tariff revenues offset distortionary taxes (Carroll and Hur 2023).

Beyond the risk of additional trade barriers, prolonged uncertainty regarding trade policies poses other risks to investment and growth (Box 1.1 shows the effect of increased uncertainty over macroeconomic policies more generally). In just the first quarter of 2025, the number of new restrictive measures announced increased by 16 percent relative to that in December 2024, with actions ratcheting from April 2 onward. Firms' concerns about fragmentation spiked along

**Figure 1.20. Rising Trade Restrictions and Fragmentation Concerns**

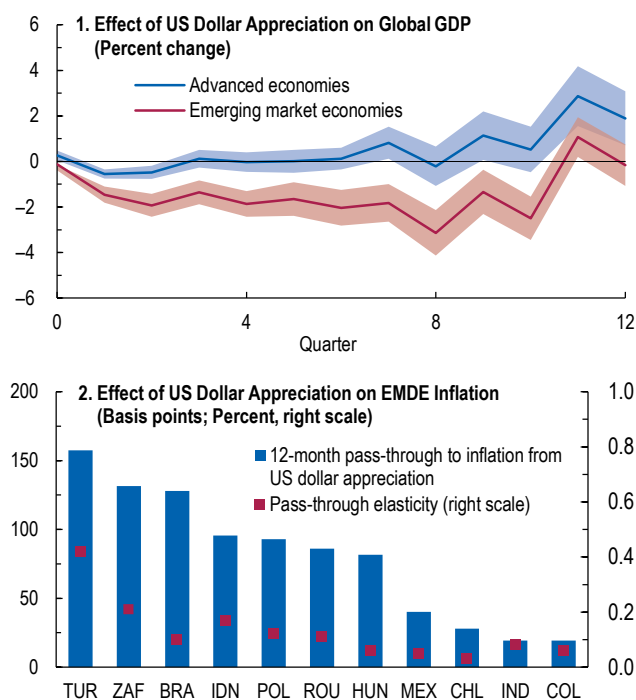


Sources: Global Trade Alert; Refinitiv Eikon; and IMF staff calculations. Note: In panel 1, data are based on a count of measures and include adjustment for reporting lags. In panel 2, fragmentation indices measure the average number of sentences, per thousand earnings calls, that mention at least one of the following keywords: *deglobalization, reshoring, onshoring, nearshoring, friendshoring, localization, regionalization*.

with the escalation in the use of restrictive measures (Figure 1.20). If uncertainty remains high for long, firms may delay investment projects, with a consequent reduction in global investment. Indeed, empirically, trade uncertainty is estimated to have reduced US investment by approximately 1.5 percent in 2018 (Caldara and others 2020). Moreover, uncertainty diminishes demand by undermining confidence and erodes consumer income in the medium term by curtailing investment and stifling trade (Handley and Limão 2017). Previous episodes of heightened trade policy uncertainty led to persistent appreciation of the US dollar (Albrizio and others, forthcoming), harming exports from the United States and dollarized countries and generating negative spillovers to emerging market and developing economies. If, in the current episode, a US dollar appreciation was to materialize, inflation pressures could be sizable where country-specific circumstances amplify the amount of pass-through from currency depreciation (Figure 1.21), especially in periods of high uncertainty and already-elevated inflation levels (Carrière-Swallow and others 2024). However, the policy-uncertainty-driven surge in risk aversion and the decline in US growth prospects might lead to a depreciation of the US dollar. A disorderly and large depreciation of the US dollar could bring additional financial market volatility.

**Financial market volatility and correction:** In some countries, if inflation persists or regains upward momentum because of new policies, central banks may maintain interest rates at higher levels than currently anticipated. This could result in cross-country interest rate differentials, which could trigger capital outflows, and tighter financial conditions, especially in emerging market and developing economies (as illustrated in Box 1.1). Financial market risks may be compounded by future corporate earnings failing to meet expectations, large and unpredictable policy shifts, or renewed geopolitical risks (see Chapter 2 of the April 2025 GFSR). The US dollar would typically be expected to appreciate if financial conditions deteriorate sharply, but the international monetary system could experience a sudden reset, with potentially major implications for the dollar as its main pillar. Worsening global financial conditions and broader disruptions to the system could trigger balance of payments crises in small countries with limited

Figure 1.21. Spillovers from US Dollar Appreciation



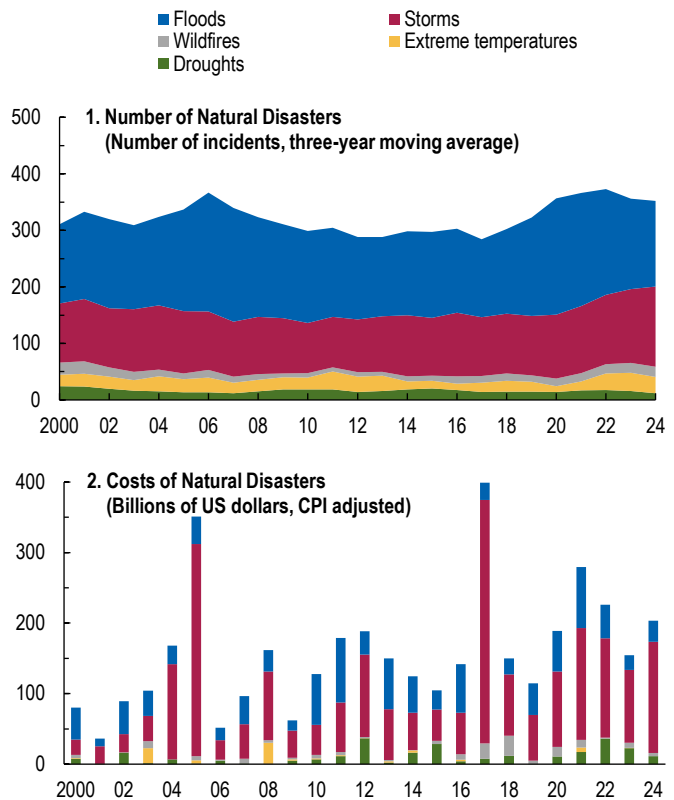
Source: IMF staff calculations.  
 Note: In panel 1, impulse responses from the IMF *External Sector Report* 2023 show the effects of a 10 percent appreciation in the nominal US dollar index with 90 percent confidence intervals. Real GDP is measured in national currencies at constant prices. “Advanced economies” exclude countries with weights in the US dollar index that are larger than 4 percent in 2020: Canada, France, Germany, Ireland, Italy, Japan, Switzerland, and the United Kingdom. In panel 2, estimates are based on Carrière-Swallow and others’ (2021) bilateral pass-through and foreign exchange depreciation against the US dollar between mid-September 2024 and the beginning of January 2025. Data labels in the figure use International Organization for Standardization (ISO) country codes. EMDE = emerging market and developing economy.

market access, high refinancing needs, and weak negotiation capacity. These risks may be amplified for commodity exporters amid a continued decline in commodity prices, particularly those for oil and copper, which typically serve as indicators of an impending recession by signaling a slowdown in industrial activity in importers, such as China. A deeper financial market correction than what was recently experienced could be triggered by weaker-than-expected US growth, in part induced by policy shifts, and reverberate through highly leveraged positions in nonbank financial institutions and firms with high near-term refinancing needs. In addition, an excessive rollback of financial regulations may lead to boom-bust dynamics, with negative repercussions for household wealth, raising systemic stress and creating adverse spillover effects throughout the global economy. In Europe, a market correction may occur if peace negotiations in Ukraine fail to reach a lasting resolution.

**Rising long-term interest rates:** Further pressure on already-high US bond yields, coupled with persistent exchange rate volatility driven by additional policy shifts and sustained policy uncertainty, could also trigger capital and FDI outflows from emerging market and developing economies. The growing concentration of capital in safe haven countries and assets could exacerbate capital imbalances and misallocation. Moreover, the structural pressure on long-term yields could constrain the fiscal space, already limited, that is necessary to heal the economic scars left by the pandemic or meet new spending needs, or it could exacerbate fiscal sustainability concerns, especially in high-debt countries (see the April 2025 *Fiscal Monitor*). Consequently, this could lead to a debt spiral dynamic in which borrowing costs escalate as fiscal adjustments become increasingly unattainable.

**Rising social discontent:** The legacy of the cost-of-living crisis, combined with reduced medium-term growth prospects, may exacerbate polarization and social unrest, hindering necessary reforms for growth. Currently, the risk of unrest is pronounced in Africa, where conflicts and rising food and energy prices have had a severe impact on vulnerable nations with limited fiscal space, and in Asia, where democratic participation in some incumbent regimes is limited and inequalities are rising (Barrett and others 2022). Although emerging market and developing economies have demonstrated resilience over the

Figure 1.22. Number and Costs of Natural Disasters



Sources: EM-DAT: The International Disaster Database; and IMF staff calculations. Note: Panel 1 is a stacked-area figure in which the values for each disaster type are cumulatively added to show their combined total over time. CPI = consumer price index.

past four years, their capacity to manage domestic challenges, especially high debt levels, in a deteriorating global environment may be tested. A resurgence in food and energy price inflation, driven by commodity market fragmentation or intensification of climate-related disasters, could worsen living conditions and heighten food security concerns, particularly in low-income countries. Across regions, a common element of social unrest episodes relates to discontent about public representation and governance, which may increase the likelihood of structural reform failure (see Chapter 3 of the October 2024 WEO).

***Increasing challenges to international cooperation:*** The increasing frequency and economic cost of natural disasters (Figure 1.22) and the intensification of conflicts—disruptive, even if localized—demand continuous and coordinated international action. Scaling back climate adaptation and international aid would risk making past investments ineffective, undermining progress toward a greener and more resilient economy and eroding human capital where it is most needed. If a lack of financial support were suddenly to materialize, living and health conditions would deteriorate in low-income and fragile countries, which might face social unrest and be forced to rely on public financing, further exacerbating their debt vulnerabilities. The macroeconomic consequences for aid-receiving countries might be substantial, including worsening of current accounts, decline in foreign reserves, pressure on exchange rates and prices, and lower consumption and investment.

***Labor supply gaps:*** Many nations have relied on foreign workers to address labor shortages, particularly following COVID-19. While a retrenchment of foreign-worker flows to advanced economies might ease strains on local services and infrastructure and provide a small boost to incomes, output would decline in recipient countries—and globally—in the long term (see Chapter 3). The resulting decline in labor supply may pose fiscal sustainability risks and hinder potential growth, especially in countries where legal immigrants tend to be well integrated and their skills meet and complement labor market needs.

### ***Upside Risks***

Despite the increased prevalence of negative risks, some factors could lead to more favorable outcomes than those in the reference forecast.

***Next-generation trade agreements:*** Continued elevated trade policy uncertainty could spark new momentum toward regional, plurilateral, and multilateral agreements, which could mitigate risks and foster policy predictability. Nondiscriminatory agreements that cover a broad set of areas, including digital and services trade and investment, could facilitate broad-based gains without introducing new distortions. Ultimately, expanding and deepening international cooperation and regional integration (for example, the EU’s single market) could increase investment, boost productivity, raise potential growth, and enhance countries’ resilience to external shocks, by expanding the reference market and diversifying trading partners (Albrizio and others 2025).

***Mitigation of conflicts:*** A resolution or mitigation of ongoing conflicts could lead to a decrease in global commodity prices and reallocate resources for productive uses. The economic impact of war can be substantial, with studies showing that the “war tax” on growth can reach 30 percent of GDP, contributing to inflation rates as high as 15 percent (Federle and others

2024), with neighboring countries most affected on average. Cessation of hostilities, along with subsequent reconstruction efforts, would not only boost GDP growth in countries directly involved in conflicts but would also have a positive influence on neighboring nations. This influence could manifest itself through the alleviation of negative spillovers, which are estimated to be on average between 5 percent and 10 percent of GDP over the five to seven years following the onset of conflict (see Chapter 2 of the April 2024 *Regional Economic Outlook: Middle East and Central Asia*), and through the generation of positive spillovers. For instance, a ceasefire in Ukraine has the potential to raise growth in the region, through a rebound in consumer confidence and reduction in energy prices, especially in Europe. However, countries that have invested in alternative infrastructures or energy sources to manage conflict-related shortages may experience negative spillovers for some time if reversals prevent them from achieving the expected returns.

**Structural reform momentum:** A generalized acceleration of structural reforms, partly reinforced by peer benchmarking among nations and challenging global macroeconomic conditions, could significantly boost growth. Streamlining regulations and reducing red tape would unlock market entry and increase competition, enhancing business dynamism and resource reallocation (as Box 1.1 illustrates for the case of China). More integrated financial, labor, and product markets could provide the depth and scale to drive more innovation and accelerate productivity growth. In Europe, tackling remaining internal barriers would allow firms to scale up. Accelerating European integration by reducing regulatory obstacles and strengthening the Capital Markets Union could increase investment, lift productivity, and raise potential growth. Such an approach would bolster the underdeveloped European capital market, contributing to a reduction of global imbalances.

**Growth engine powered by artificial intelligence (AI):** Optimism about AI, coupled with an expected significant annual reduction in AI usage costs and future technological advancements, could boost productivity and consumption significantly. The integration of AI technologies could lead to knowledge spillovers across industries and regions, fostering innovation and driving down costs globally. These gains could materialize without significant adverse effects on employment if AI adoption is accompanied with policies that upgrade regulatory frameworks and support labor reallocation (Cazzaniga and others 2024). They could also materialize without escalating electricity prices and environmental costs if policymakers, in collaboration with businesses, seize the opportunity by embracing and incentivizing renewable energy sources and innovative production paradigms (see the Commodity Special Feature).

### **Policies: Navigating Uncertainty and Enhancing Preparedness to Ease Macroeconomic Trade-offs**

The global economy is at a critical juncture, with substantial policy pivots and uncertainty. A range of plausible alternatives are possible, shaped by rapidly changing trade policies. In the face of ongoing structural shifts, heightened uncertainty, and persistently weak growth, policies should focus on steps to restore confidence and stability, reduce imbalances, and sustainably lift growth. Reducing policy-induced uncertainty and resolving trade tensions can promote a more

stable environment, bolster consumption, and facilitate investment. In the short term, countries need to calibrate monetary and prudential policies carefully to maintain price and financial stability. Gradually rebuilding fiscal space remains critical for managing increased public spending needs and building sufficient buffers to address future shocks, which could be sizable and recurrent. To uplift growth prospects in the medium term, it remains urgent to deliver on structural reforms, while prudently harnessing the benefits of technological advances.

### **Managing Trade Tensions and Prolonged Elevated Trade Policy Uncertainty**

*Delivering a stable and predictable trade environment.* Countries should work constructively to urgently resolve trade tensions and promote clear and transparent trade policies to stabilize expectations, avoid investment distortions, and reduce volatility while avoiding steps that could further harm the world economy (Georgieva 2025). In the wake of greater trade policy uncertainty, pragmatic cooperation and deeper economic integration (Rotunno and Ruta, forthcoming) can help countries expand trade either through nondiscriminatory unilateral reductions of trade barriers or at the regional, plurilateral, or multilateral level, as free trade agreements (accession of the United Kingdom to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership and the EU–New Zealand trade agreement) have shown. Greater regional integration, such as that involved in deepening the EU single market (October 2024 *Regional Economic Outlook: Europe*) or continuing efforts toward African Continental Free Trade Area implementation (El Ganainy and others 2023) can similarly enhance global efficiency even in the presence of distortionary trade policies.

Broad subsidies generate large fiscal costs and additional distortions and are thus not a well-suited tool for countering domestic or external distortions. However, in specific cases, targeted industrial policies can alleviate sectoral market failures as a result of externalities or economies of scale. Yet industrial policies are costly and can lead to various forms of government failures, in turn leading to misallocation of resources (Ilyina, Pazarbasioglu, and Ruta 2024). Poorly targeted industrial policies can drive production away from underlying patterns of comparative advantage, create regional or global oversupply, and result in changes in terms of trade that reduce domestic welfare (Hodge and others 2024). Amid limited fiscal space, industrial policy programs should be subjected to a comprehensive cost-benefit analysis. To minimize distortions, industrial policies should be targeted narrowly to specific objectives in sectors in which externalities or market failures are well identified. Finally, cooperation regarding industrial policy approaches among international trading partners can reduce negative spillovers (Brandão-Marques and Toprak 2024).

*Preserve international cooperation.* International cooperation, including cooperation through regional and cross-regional groups, is essential to sustain global growth, tackle common problems, and mitigate cross-country spillovers. In several policy areas, including trade, industrial policy, international taxation, climate, and development and humanitarian assistance, international cooperation and platforms (Aiyar and others 2023) can mitigate global spillovers and protect the vulnerable. International tax cooperation can diminish the effects of ongoing harmful tax competition by preventing a race to the bottom in global corporate taxes. In low-income countries, multilateral assistance will become even more important for addressing budget and development needs if bilateral foreign aid flows decline.

### Maintaining Price and Financial Stability

*Calibrate monetary policy amid two-sided risks.* As countries are experiencing a multifaceted combination of shocks, central banks need to carefully calibrate monetary policy to country-specific circumstances. Trade policy shocks adversely weigh on supply while persistent uncertainty and negative wealth effects from the April 2025 asset price correction dampen aggregate demand. As these shocks unfold, central banks should monitor the interplay of sectoral supply pressures and sectoral demand, because a steepening of sectoral supply curves could trigger renewed inflationary pressures (see Chapter 2 of the October 2024 WEO). Where near-term inflation risks are tilted to the upside or inflation expectations are rising, future cuts to the policy rate should remain contingent on evidence that inflation is heading decisively back toward target. This can ensure inflation expectations remain anchored while guarding against the risk of premature monetary policy easing followed by later rate hikes. Without price stability, any gains from future growth are at risk of being more than offset by a renewed cost-of-living squeeze. Central banks need to be particularly vigilant regarding those risks after the recent period of prolonged inflation and should be ready to act forcefully, because inflation expectations may be much less stable in instances of renewed inflationary pressures. If growth is declining or labor markets are softening while inflationary pressures and inflation expectations are clearly returning toward target, maintaining a constant level of nominal policy rates will, over time, result in a restrictive real policy stance as inflation declines while growth weakens. In these circumstances, gradual reductions in the policy rate to move the policy stance closer to the neutral rate are appropriate. Overall, in the face of elevated uncertainty, there is a premium on clear communication, which can enhance predictability for all economic agents.

Elevated uncertainty also intensifies the trade-off between anchoring inflation expectations and safeguarding financial stability. Where central banks' efforts to stabilize inflation expectations lead to a tightening of financial conditions, this may exacerbate vulnerabilities within the financial system, complicating operations for financial institutions (Bergant and others 2025). Therefore, it is crucial to strike a balance between maintaining stable inflation expectations and ensuring that financial stability is not compromised, particularly amid financial market volatility.

*Mitigate disruptive foreign exchange volatility.* Persistent trade policy uncertainty, broader policy shifts, cross-country divergence in paths to monetary policy normalization, and a more volatile currency outlook could further amplify recent bouts of financial market volatility. This could trigger disruptive capital outflows, which would particularly affect countries with higher import dependence or a greater share of dollar-invoiced imports. The IMF's Integrated Policy Framework provides guidance tailored to country-specific conditions on appropriate policy responses.

In countries with well-functioning and deep foreign exchange markets and low levels of foreign-currency debt, exchange rate flexibility and raising policy rates are advisable. Financial market policies, including rapid, decisive, and well-designed liquidity support, are suitable tools for mitigating bouts of foreign exchange market volatility that emanate from trade partners' policies or from US dollar movements. At the same time, for countries with shallow foreign exchange markets or sizable amounts of foreign-currency-denominated debt, an abrupt

tightening of global financial conditions may trigger disruptive foreign exchange volatility and rising risk premiums, which could pose risks to macrofinancial stability. In these circumstances, while maintaining suitable monetary and fiscal policies, temporary foreign exchange interventions or capital flow management measures could be appropriate. These should be complemented with macroprudential measures to mitigate disruptions from large foreign-currency-denominated debt holdings and financial market reforms to deepen domestic capital markets over the medium term.

*Safeguard financial stability through prudential policy.* High uncertainty about the economic outlook and financial market volatility puts a premium on robust prudential policies to safeguard financial stability. Jurisdictions experiencing financial market stress should release available macroprudential buffers to support the provision of credit to the economy and avoid a broad tightening of financial conditions and cascades of business failures and bankruptcies. Should stress levels reach crisis proportions, authorities should be ready to deploy liquidity and fiscal instruments to avoid excessive deleveraging and damage to the real sector. Where regulatory changes are being implemented, financial stability policies—including macroprudential policies and Basel III reforms—should be maintained to strengthen the supervision of financial institutions and the monitoring of financial stability risks. Enhancing reporting requirements and strengthening policies to mitigate vulnerabilities in nonbank financial institutions are crucial for reaping the benefits of the latter’s role in financial intermediation.

### Rebuilding Fiscal Buffers to Regain Budgetary Maneuver Space

Restoring fiscal space and putting public debt on a sustainable path, while meeting important spending needs to ensure national and economic security, remains a priority. This requires credible medium-term fiscal consolidation with decisive yet growth-friendly adjustments. Greater fiscal discipline would also help contain borrowing costs and thus provide a guardrail against the risk of high or higher interest rates amid higher term premiums and upside risks to inflation in some countries. Fiscal adjustment plans should focus primarily on credibly rebuilding buffers to keep financing costs reasonable, help anchor medium-term inflation expectations, and contain risks relating to sovereign rating downgrades. Moreover, countries should reprioritize expenditures and boost fiscal revenues, including by broadening their tax bases; permanent increases in spending should be financed with revenues, and a greater focus on enhancing public sector spending efficiency may be warranted, particularly if fiscal space is constrained. Where negative demand shocks from recent tariffs and trade policies are large, automatic stabilizers can dampen their impact. New discretionary measures—designed to be well targeted and temporary and with clear sunset clauses—should be deployed only for households, firms, or industries affected by severe trade dislocations.

*Devise adjustment plans to restore fiscal sustainability.* For many countries, current fiscal policies fall short of what is needed to ensure that debt has a high probability of stabilizing (Chapter 1 of the April 2025 *Fiscal Monitor*). A credible fiscal adjustment plan would be grounded in realistic assumptions about growth, debt-servicing costs, revenue mobilization, and spending needs. For countries where new spending needs arise, demonstrating a clear commitment to safeguarding debt sustainability, the integrity of fiscal rules, and fiscal policy transparency are crucial. In countries with fiscal space, net expenditures, excluding defense investment, should remain

bound to already-agreed-upon commitments. In economies with limited fiscal space, both permanent and temporary increases in fiscal outlays should be financed by fiscal revenues and spending reprioritization.

The strengthening of medium-term fiscal frameworks and fiscal rules can support fiscal adjustment plans, as can greater fiscal transparency, including that in regard to contingent liabilities and debt-creating flows outside the fiscal deficit. Binding legislation and clear contingencies on how governments will respond to unexpected changes in economic conditions—changes in growth, interest rates, or spending needs—under realistic assumptions can further bolster credibility.

For countries in or at high risk of debt distress or facing potential noncompliance with fiscal regulations, achieving fiscal sustainability may require not only fiscal consolidation, but also debt restructuring. Furthermore, progress in the implementation of international sovereign debt resolution frameworks, including the Group of Twenty (G20) Common Framework, and increased consensus at the Global Sovereign Debt Roundtable (GSDR), will make debt restructuring (when necessary) less costly.

*Enact targeted fiscal reforms.* Careful design and composition of fiscal adjustment plans can prevent prolonged negative growth effects, with specific policy mixes requiring country-specific calibration. In advanced economies, expenditure reprioritization, entitlement reforms, and revenue increases through indirect taxes or removal of inefficient incentives, depending on countries' circumstances (April 2025 *Fiscal Monitor*), can support fiscal adjustment. Emerging market and developing economies have greater space to strengthen domestic revenue mobilization, needed to meet spending needs and boost job creation. Measures include broadening tax bases, by reducing informality as well as taking other measures, and enhancing revenue administration capacity. Across countries, there is scope for reducing inefficient subsidies. Gradual reforms, announced and implemented during more favorable macroeconomic conditions and combined with redistribution policies, can enhance public support for major expenditure reform in areas such as energy subsidies and pension reform (Chapter 2 of the April 2025 *Fiscal Monitor*).

*Protect growth and the vulnerable.* Fiscal adjustments need to be carefully calibrated to avoid negative impacts on potential growth and mitigate distributional impacts. Growth-friendly elements of spending, such as high-quality public investments in infrastructure and digitalization, can lift medium-term growth potential and should be protected. Spending on growth priorities can be complemented with structural reforms to labor markets and regulation. Protecting the poor and the vulnerable can further cushion the impact on inequality and enhance social acceptability of fiscal reforms. Eliminating poorly targeted subsidies such as those for energy can simultaneously reduce distributional impacts and contribute toward achieving climate-related objectives.

*Use timely, targeted, temporary support where essential, in a responsible way.* For countries where negative demand shocks are large, automatic stabilizers should play their role in dampening the shocks' impact. Where large shocks and severe trade dislocations have a serious negative impact on households, firms, or sectors, additional targeted and temporary support could be deployed.

Such measures need to be appropriately designed to ensure proper targeting, include automatic sunset clauses to avoid entrenched support that prevents adjustment and reallocation, and mitigate fiscal and political economy risks. Responsibly adjusting the fiscal envelope to support such new support, based on country-specific fiscal space consideration, is critical to ensuring that public debt remains on a sustainable path.

### Reinvigorating Medium-Term Growth

Potential growth remains subdued and cost-of-living pressures persist in the aftermath of the pandemic. Lifting medium-term growth prospects is the only sustainable way to achieve a broad-based increase in living standards and ease macroeconomic trade-offs. Higher growth would support debt sustainability dynamics, thus increasing fiscal space in the medium term. Broad-based structural reforms can contribute to raising growth potential, and multilateral cooperation can support resilience in the wake of elevated uncertainty.

*Enact structural reforms.* Durable structural reforms across several areas, including labor markets, education, regulation and competition, and financial sector policies, can jointly lift productivity and potential growth and support job creation. In addition, technological progress, including that related to digitalization and AI, can enhance productivity and potential growth.

Increasing female labor force participation can increase labor supply. Amid continued but uneven population aging in both advanced economies and emerging market and developing economies, policies to improve human capital and the labor outcomes of older workers, including health policies and those pertaining to continued training and development, can improve those workers' labor market attachment and productivity (Chapter 2). A well-designed mix of labor market interventions can also contribute to gradually raising the effective retirement age. In addition to domestic labor market policies, evidence suggests that increased migration flows can attenuate challenging demographic outlooks while mildly boosting growth (Chapter 3). This requires facilitating the swift labor market integration of migrants (Caselli and others 2024) and ensuring that skills are well matched with job opportunities (Beltran Saavedra and others 2024). Measures to attenuate the distributional impacts of labor market reforms, as well as governance reforms, can further strengthen trust in public institutions (see Chapter 3 of the October 2024 WEO). Robust regulatory frameworks coupled with investments in digital infrastructure and a digitally competent workforce are critical to ensure gains from new technologies are broadly shared across the workforce (Georgieva 2024).

Targeted deregulation can ease constraints hindering firms from stimulating entrepreneurship, investment, and innovation, thus ultimately boosting medium-term growth potential. Estimates suggest sizable distortions and real GDP costs averaging 0.8 percent of annual GDP for a set of European countries (Pellegrino and Zheng 2024). Maintaining prudential regulations and safeguarding financial stability remain key when reducing bureaucracy. Premature or uncoordinated deregulation would increase financial stability risks and could fuel dangerous boom-bust dynamics.

Labor market and regulatory reform should be complemented with policies to alleviate financial constraints. Increasing financial accessibility and reducing financial barriers to efficient capital allocation (see Chapter 3 of the April 2024 WEO) could further boost productivity

## WORLD ECONOMIC OUTLOOK

growth. Removing internal trade barriers and advancing capital market reforms are critical for business dynamism, notably that among innovation-intensive firms that lack tangible collateral (see Note One of the October 2024 *Regional Economic Outlook: Europe*).

Although structural reforms have been well identified for several years, securing broad social acceptability for such reforms has often been a significant obstacle. To increase the likelihood structural reforms will succeed and to enhance the social acceptability of reform agendas, participative processes are needed, coupled with efforts to strengthen public understanding of reform proposals and continued stakeholder engagement throughout the reform process (see Chapter 3 of the October 2024 *World Economic Outlook*; Chapter 2 of the April 2025 *Fiscal Monitor*).

*Make progress on climate policies.* Addressing climate change requires a well-designed policy mix that can generate macroeconomic benefits, including low-carbon, resilient growth. This includes investments in renewable and energy-efficient technologies and economy-wide measures such as carbon pricing, which can be complemented by fiscal incentives, technical assistance, and financial support for adaptation projects in low-income countries. Many countries are transitioning from fossil fuels to renewables, which can help improve energy security (Dolphin and others 2024), benefit employment, and reduce balance of payments risks.

### Box 1.1. Risk Assessment Surrounding the Reference Forecast

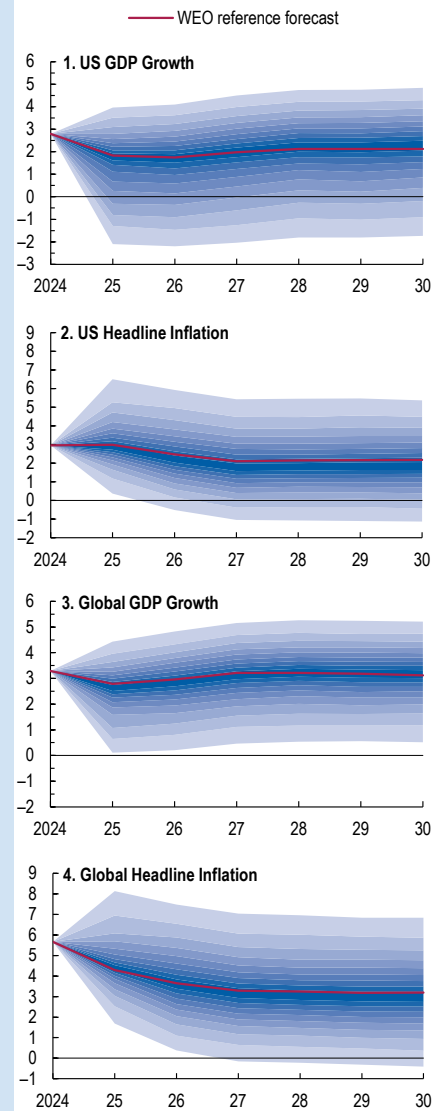
This box presents two complementary assessments of risks to the global economy. First, it uses the IMF’s Group of Twenty (G20) model to derive confidence bands around the *World Economic Outlook* (WEO) reference forecast. Second, based on the IMF’s Global Integrated Monetary and Fiscal (GIMF) model, it simulates two scenarios. Policies and shocks in scenario A result in a widening in global imbalances and a fall in global output relative to those in the reference forecast; policies in scenario B result instead in a narrowing of global imbalances and an increase in global output relative to those in the reference forecast.

#### Confidence Bands

The first assessment identifies the economic shocks underlying historical data using the G20 model. It then resamples these shocks and feeds them back through the model to generate risk distributions (Andrle and Hunt 2020). The procedure has been adjusted to align with the growth-at-risk assessment presented in the April 2025 *Global Financial Stability Report* (GFSR). As in the previous assessment in the October 2024 WEO, growth distributions are skewed to the downside, and inflation distributions are somewhat skewed to the upside.<sup>1</sup>

Panels 1 and 2 in Figure 1.1.1 show the distributions for US growth and headline inflation, respectively (90 percent confidence bands represented in the blue-shaded areas). The probability of a recession occurring in 2025 is now assessed at 37 percent, higher than in the October 2024 WEO.<sup>2</sup> Risks have moved farther to the upside for US inflation and policy rates (not shown), in part reflecting the upward revision to projected inflation in the WEO reference forecast. The risk that 2025 US headline inflation will rise above 3.5 percent is now more than 30 percent, compared with 13 percent back in October; the

Figure 1.1.1. Forecast Uncertainty around Global Growth and Inflation Projections (Percent)



Source: IMF staff estimates.  
Note: Each shade of blue represents a 5 percentage point probability interval. WEO = World Economic Outlook.

The authors of this box are Michal Andrle, Jared Bebee, Domenico Giannone, Chris Jackson, Dirk Muir, Rafael Portillo, and Philippe Wingender.

<sup>1</sup> Aligning with the growth-at-risk assessment requires sampling some recession years more often: 1969, 1974–75, 1981, and to a lesser extent 2009 and 2020.

<sup>2</sup> The recession risk for 2025 is defined as the probability that 2025 annual growth will be below 1.2 percent, consistent with a shallow recession starting in the third quarter. The probability of a short-lived US recession in 2025, according to this criterion, was assessed to be about 25 percent at the time of the October 2024 *World Economic Outlook* (WEO).

probability that the average 2025 three-month Treasury bill rate will rise above 4.5 percent for 2025 is about 33 percent (up from 27 percent in October).

Panels 3 and 4 in Figure 1.1.1 show the distributions for global growth and headline inflation. The probability that global growth in 2025 will fall below 2 percent is assessed at close to 30 percent, higher than the assessment done in October (17 percent). The probability that global headline inflation will rise above 5 percent is estimated at about 31 percent, slightly lower than the corresponding estimate of 34 percent at the time of the October WEO.

**Scenarios**

The GIMF model is next used to simulate two scenarios. The version of the model used here has 10 regions, including China, the United States, and the euro area.

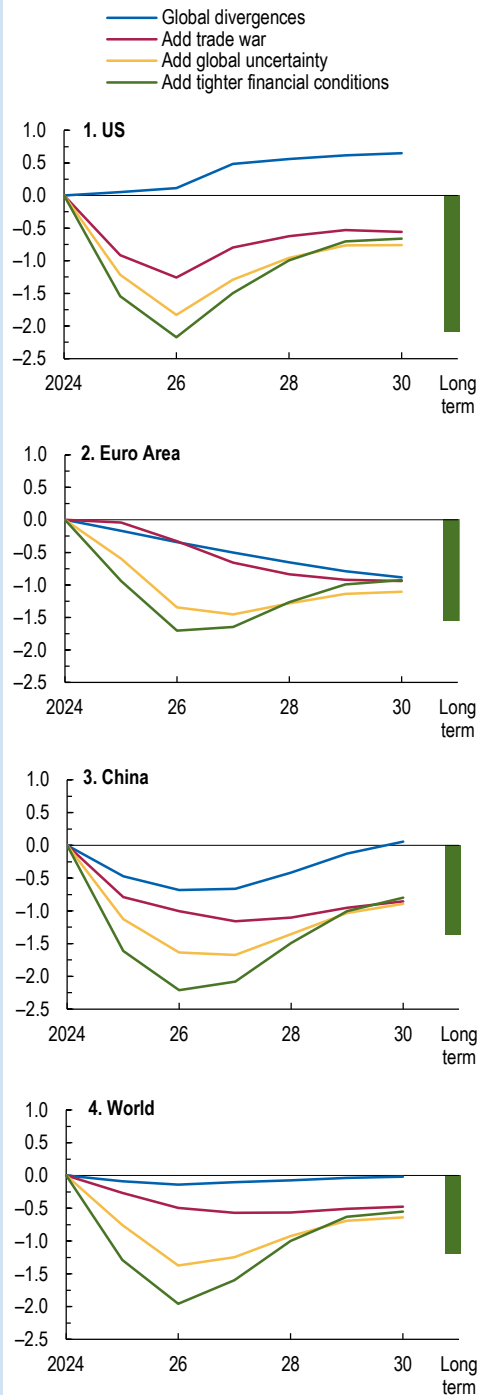
The scenarios assume monetary policy responds endogenously, with floating exchange rates in most regions. In scenario A, China’s currency is managed relative to the dollar through capital flow measures, allowing some exchange rate adjustment in response to shocks but by less than what would be implied by a fully floating regime; in scenario B, the renminbi adjusts as in a flexible exchange rate regime. On the fiscal side, automatic stabilizers are allowed to operate.

**Layers Considered in Scenario A**

**Global divergences.** The layer has three components:

- *Renewal of the US Tax Cuts and Jobs Act (TCJA).* Scenario A assumes renewal of a broad set of provisions in the TCJA for a period of 10 years, including individual and business taxes, the child tax credit, and expensing of investment, totaling about 11 percent of GDP over 2025–34. The accompanying deficits are back-loaded, reaching about 1.4 percent of GDP by 2027. Because the renewal comes after a historical inflation surge, the layer assumes a small additional temporary increase in US inflation expectations.
- *Lower productivity in Europe.* The recent slowdown in productivity growth in the euro area deepens as a result of lower innovation, technological shifts, and lack of access to equity funding. Total factor productivity growth declines by 0.2 percentage point per year over five years, relative to that in the reference forecast, starting in 2025. The decline is concentrated in the tradables sector.

**Figure 1.1.2. Impact of Scenario A on GDP**  
(Percent deviation from reference forecast)



Source: IMF staff estimates.  
Note: "Long term" is at least 50 years ahead.

- *Weaker domestic demand in China.* Consumption and investment fall relative to those in the reference forecast by 0.7 and 0.5 percent, respectively, in 2025. The decline builds over 2026–27 and fades after that.

**Trade war.** The scenario assumes a ratcheting up of tariffs in response to the April 2 announcement. First, it incorporates an additional 50 percentage point increase in tariffs on all China-US trade in both directions relative to the reference forecast in this report. Second, countries other than China respond tit for tat to the April 2 announcement, raising tariffs on imports from the United States by the same rate. Third, the United States responds by doubling the rate announced on April 2 to all countries other than China. As a result, there is an increase of about 18 percentage points in the effective tariff rate on both US goods imports and US goods exports, relative to the current reference forecast.

**Increase in global uncertainty.** Uncertainty over macroeconomic policies increases. The resulting shock is equivalent to a three-standard-deviation increase in the global economic policy uncertainty measure in Davis (2016), about 50 percent larger than the spike observed in 2018–19. Regions more directly exposed to tariff measures, or where trade represents a larger share of activity, experience a somewhat greater uncertainty shock.

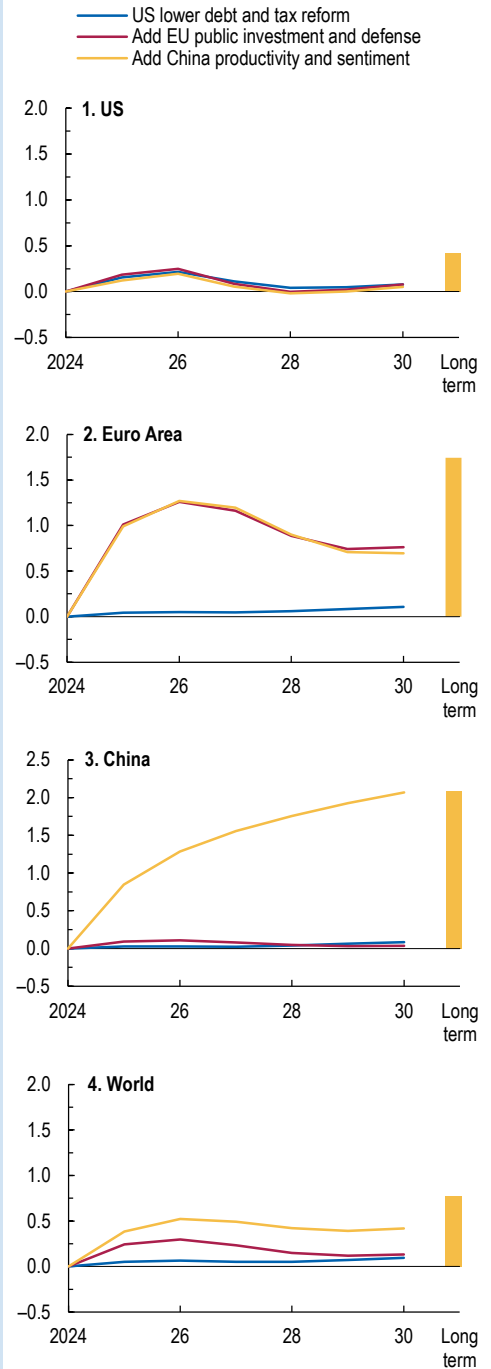
**Tighter financial conditions.** The combination of shocks in the scenario triggers a tightening in financial conditions. Asset prices decline globally in 2025, with the largest decline in the US (about 5 percent on average for the year) and in emerging markets (about 3 percent). Sovereign and corporate premiums in emerging markets excluding China increase by 50 basis points; corporate premiums in advanced economies and China increase by 25 basis points. The tightening in financial conditions lasts for two years.

**Layers Considered in Scenario B**

**Lower US government debt.** The United States embarks on a series of fiscal reforms to reduce inefficiencies from poorly targeted tax expenditures, shift from labor to consumption taxes, and contain health care costs. In addition, government consumption is permanently reduced. These reforms, alongside savings from lower interest payments, lead to a gradual decline of the overall fiscal deficit, which reaches 1 percent of GDP after five years. The US public debt declines by 25 percentage points of GDP in the long term.

**Higher public spending in Europe.** Public investment increases in the euro area starting in 2025. It reaches 1 percent of GDP in additional spending by 2026, stays at that level until 2030,

**Figure 1.1.3. Impact of Scenario B on GDP**  
(Percent deviation from reference forecast)



Source: IMF staff estimates.  
Note: "Long term" is at least 50 years ahead. EU = European Union.

and remains permanently higher by 0.4 percent after that to sustain a higher stock of public capital.<sup>3</sup> The latter raises total factor productivity and potential output permanently. The layer also includes a permanent increase in defense spending of 0.3 percent of GDP, starting in 2025. Over the WEO horizon, about two-thirds of the surge in spending is financed by higher deficits. From 2030 onward, however, the increase in public capital and defense spending is offset by a reallocation of existing spending, such that debt ratios gradually return to those in the reference forecast.

**Productivity gains and rebalancing in China.** Structural reforms that reduce barriers to entry and reforms to state-owned enterprises lead to increased market dynamism, and strengthening of the social safety net leads to demand-side rebalancing. Productivity in the tradables and nontradables sectors increases by about 2 and 0.5 percent, respectively, through 2030, boosting sentiment in the short run. The saving rate decreases by 2 percentage points of GDP over the same period.

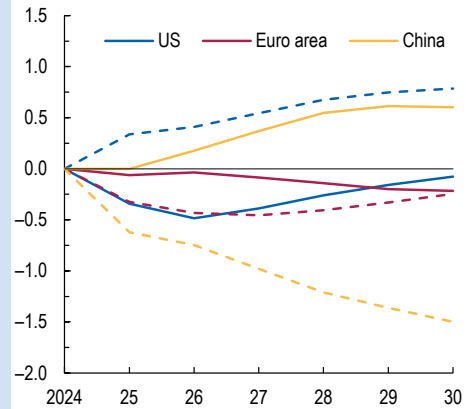
**Impact on World Economy**

Figures 1.1.2 and 1.1.3 present the effects, for scenarios A and B, on the level of GDP during 2024–30 and in the long term, for China, the United States, the euro area, and the world. Effects are presented as percent deviations from the reference forecast.<sup>4</sup> Figure 1.1.4 shows the total effects of the scenarios on the current account balances of these three main regions as deviations from the reference forecast in percentage points of GDP.

In scenario A, the *global divergences* layer is somewhat stimulative for the US economy as a result of the *TCJA renewal*. The impact is limited initially but builds over time. Over 2025–26, the layer adds 20–30 basis points to US headline inflation and 30 basis points to the US policy rate and results in a modest appreciation of the dollar. *Lower productivity in Europe* reduces euro area activity gradually. The component lowers GDP by about 0.3 and 0.5 percent in 2025 and 2026. As demand falls in lockstep with potential, the impact on the region’s inflation and policy rates is close to zero. *Lower domestic demand in China* subtracts 0.3 and 0.5 percent from China’s reference forecast GDP in 2025 and 2026, respectively, with the decreases reflecting mainly lower consumption. The component reduces China’s headline inflation by an additional 20–30 basis points in 2025–26, with the effects amplified by limited adjustment of the renminbi-to-dollar exchange rate.

The *trade war* layer reduces global demand, especially for US and Chinese goods. Differences in US tariff rates across countries create scope for trade diversion, and some regions benefit slightly

**Figure 1.1.4. Impact of Scenarios A and B on Current Account in Percent of GDP**  
(Percentage point deviation from reference forecast; solid = Scenario A, dashed = Scenario B)



Source: IMF staff estimates.  
Note: Scenario A includes global divergences, trade war, increases in global uncertainty, and tighter financial conditions. Scenario B includes lower debt and tax reform in the US, higher public spending in the European Union, and productivity gains and rebalancing in China.

<sup>3</sup> The scenario is similar to the scenario considered in the October WEO, but the increase in public investment is smaller and the financing assumption is somewhat different. The October scenario was implemented using a different model, the G20 model, leading to some differences in multipliers and spillovers.

<sup>4</sup> The impact on growth rates is approximated by subtracting the effect on output from the previous year.

in the short run, for example, the euro area. The effect is short-lived: As relative prices and sectoral demand adjust, the impact on activity becomes uniformly negative across countries. The effect builds over time as tariffs weigh on capital accumulation. Tariffs reduce world GDP by 0.6 percent by 2027 and by 1 percent in the long term. There is a small increase in global inflation of about 10 basis points in 2025–26, as the direct effect from higher tariffs is offset by the disinflationary effect from reduced activity.<sup>5</sup> Inflation falls below the reference forecast after that, including inflation in the United States.

The *increase in global uncertainty* layer reduces global investment by close to 2 percent in 2025 and 3 percent in 2026, relative to the reference forecast. Global consumption also decreases over 2025–27. The overall impact on global output from this layer is closer to –0.5 percent of that in reference forecast in 2025 and –0.8 percent in 2026. The layer contributes a moderate decrease in global inflation and policy rates of close to 20 basis points by 2026. The *tighter financial conditions* layer subtracts 0.5 percent from global GDP in 2025, with all regions being affected, from both the domestic tightening and international spillovers.

The combined effect of the layers in scenario A is a decrease in global GDP of about 1.3 percent by 2025 and 1.9 percent by 2026, relative to the reference forecast. All regions see a sizable decline in activity over the WEO horizon and in the long term, with the long-term impact reflecting tariff distortions and lower productivity. The decrease in global activity is disinflationary, with global headline inflation and policy rates falling by close to 40 basis points by 2027. Inflation and policy rates are initially flat in the United States but fall below those in the reference forecast after 2026. The current account balance decreases in the United States (the deficit worsens relative to the reference forecast) and increases in China and the rest of the world.

In scenario B, the *lower US government debt* layer reduces US debt by 25 percent of GDP over the long term, increasing fiscal sustainability. US fiscal reforms have a positive short-run effect on US activity, with GDP increasing by 0.2 percent in 2025–26. Inflation net of tax effects is slightly higher than that in the reference forecast, as are policy rates. The reduction in US public debt leads to a gradual decline in US and global real interest rates, which decrease by 10 basis points in the long run. Beyond the WEO horizon, the long-run effect is positive for both US and world GDP, by 0.4 and 0.2 percent relative to the reference forecast, respectively. The United States also experiences an increase in its current account balance (lower deficits than in the reference forecast).

The *higher public spending in Europe* layer provides a sizable boost to the euro area, raising GDP by up to 1.3 percent by 2026, relative to that in the reference forecast. Inflation increases by more than 20 basis points over the WEO horizon, with the euro area policy rate increasing by about 50 basis points. The current account balance decreases (lower surplus than in the reference forecast). The buildup in public capital raises productivity and potential output in the euro area permanently. Spillovers to other regions are positive but small.

The *productivity gains and rebalancing in China* layer raises that country's GDP by about 1 percent by 2026, relative to that in the reference forecast; about one-third of the increase is the result of improved sentiment. The reduction in the saving rate adds to domestic demand, and potential output increases gradually to 2 percent above the current reference forecast, with a positive net

<sup>5</sup> The effect of tariffs on inflation is uncertain, as explained in Box 1.2. The effect depends on responses of exchange rates, wages, and firms' markups.

## WORLD ECONOMIC OUTLOOK

effect on inflation that reaches about 20 basis points by 2030. China's current account decreases considerably (lower surplus relative to that in the reference forecast).

Finally, the combined effect of the layers in scenario B is an increase in global output of about 0.4 percent by 2026 (0.8 percent in the long term) and an increase in global inflation of about 15 basis points.

## Box 1.2. The Global Effects of Recent Trade Policy Actions: Insights from Multiple Models

This box analyzes the macroeconomic implications of recent tariff announcements included in the *World Economic Outlook* (WEO) reference forecast and provides a range of possible outcomes regarding their macroeconomic impact. The effects of tariffs are complex, operating through different channels that may not be sufficiently captured by a single model. The analysis here draws on three models: the IMF’s Global Integrated Monetary and Fiscal (GIMF) model and two trade models based on Caliendo and Parro (2015; hereafter “CP”) and Caliendo, Feenstra, Romalis, and Taylor (2023; hereafter “CFRT”).<sup>1</sup> The impacts on global activity are negative and larger for countries experiencing higher tariff increases or more directly exposed. The effects on inflation, and to some extent exchange rates, are uncertain and depend on various factors. This assessment for activity should be considered a lower bound. The impact on inflation could also be greater than expected. Notably, further escalation of trade measures beyond those discussed in this box and prolonged uncertainty about future tariffs amplify the negative macroeconomic effects but are not considered here.<sup>2</sup>

### *Tariff Announcements Included in the Model-Based Assessment*

The box considers the set of tariff measures that were implemented between February 1 and April 4, 2025. These include unilateral tariff increases by the United States. Some are country and region specific, such as the April 2 tariffs levied in proportion to partners’ bilateral trade surpluses, with a minimum rate increase of 10 percent. Other tariff increases are on specific goods and commodities, such as steel and aluminum and auto and auto parts. The combined measures increase the effective overall tariff rate in the United States by about 25 percentage points, ranging from an average increase of about 15 percentage points for Canada, the euro area, and Mexico to 27 percentage points for an aggregate of Asian countries excluding China and more than 50 percentage points for China.

Tariff responses by US trading partners are also included here. Canada places a 25 percent tariff on 40 percent of imports of US goods. It is also assumed to respond with one-to-one tariffs on imports of US autos. In response to the April 2 tariffs, China increases tariffs on all US imports by 34 percentage points, in addition to earlier targeted measures aimed at some energy, transport, and agricultural goods. Overall, the countermeasures amount to an effective tariff rate increase of about 5 percentage points on total US goods exports.

**The models.** GIMF is a global dynamic model featuring capital accumulation, numerous rigidities, three sectors, and global value chains. The version of GIMF employed here has eight countries. CP and CFRT are static models with rich country and sectoral structures (160 countries and 12 sectors in the specification of CP used here, 60 and 17, respectively, in this specification of CFRT) and detailed input-output linkages. CP assumes constant returns to scale, whereas CFRT features heterogeneous firms with increasing returns to scale determining whether to produce and export.

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The authors of this box are Diego Cerdeiro, Rui Mano, Dirk Muir, Rafael Portillo, Diego Rodriguez, Lorenzo Rotunno, Michele Ruta, Elizabeth Van Heuvelen, and Philippe Wingender.

<sup>1</sup>A similar comparison was featured in Box 4.4 of the April 2019 *World Economic Outlook*, at the time of previous tariff hikes by China and the United States.

<sup>2</sup> Box 1.1 analyzes the role of heightened policy uncertainty.

*Short-Term Effects*

GIMF is used to assess the short-term dynamics (one to three years).

*Assumptions.* Endogenous monetary policy responses are assumed, with fully floating exchange rates in Canada, the euro area, Mexico, the United States, and other regions. The yuan-to-dollar exchange rate is assumed to be managed through capital flow measures, which allows some exchange rate adjustment in China but by less than what would be implied by a fully floating regime. Tariff revenues are used to reduce debt over the first 30 years; in the long term they are rebated to households.

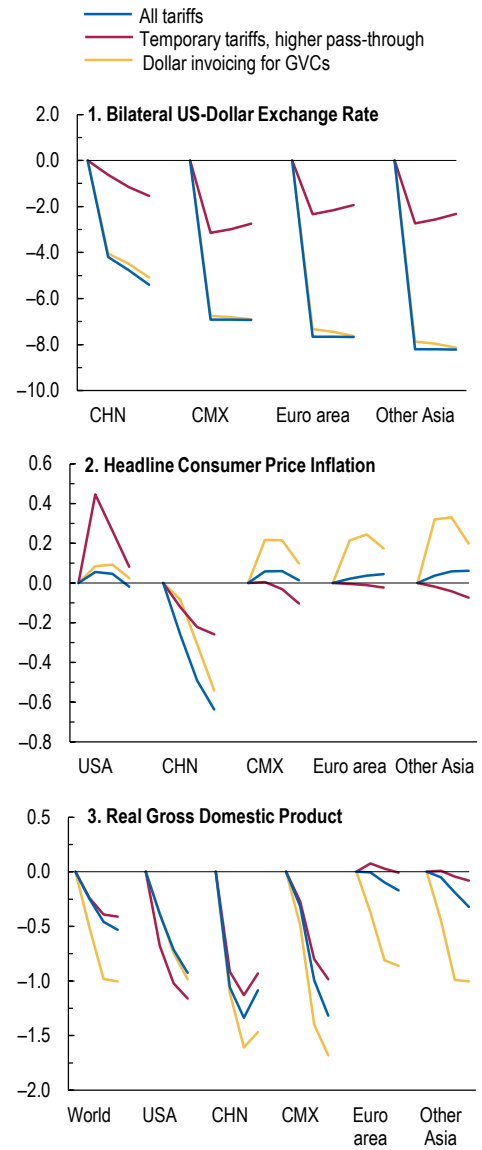
Along with the standard specification of GIMF, the short-term analysis considers two additional specifications (“versions”) that vary along the following dimensions:

- *US Dollar invoicing of global trade.* In the first specification, exporters charge for their wares in local currency. An alternative version assumes instead that about half of global trade is denominated in dollars. This assumption leads to inflationary pressures in other countries when the US dollar appreciates.
- *US inflation.* The initial assumption is that tariffs are perceived as permanent (resulting in a large appreciation of the dollar) and that US firms partly absorb the resulting increase in import costs through lower margins. In this alternative version, tariffs are expected to be removed after several years (limiting dollar appreciation), and US firms are assumed to fully pass higher import costs through to consumers. Both assumptions cause the tariff increases to result in higher inflationary pressures in the US.

Figure 1.2.1 shows the impact across the three versions of GIMF (the standard specification plus the two alternative versions) for bilateral real exchange rates with respect to the US, for inflation, and for GDP. Results are shown in deviations from a no-tariff baseline for the world, the United States, China, Canada and Mexico combined (CMX in the figure), the euro area, and other Asian countries.

*Currencies.* Higher tariffs lead to a depreciation of currencies with respect to the dollar (Figure 1.2.1, panel 1). The euro area and Other Asia experience the largest depreciations. The yuan

**Figure 1.2.1. Short-Run Effects of Tariffs**  
(Percent deviation from a forecast with no tariffs)



Source: IMF staff estimates.  
Note: The figure shows results from tariff simulations using the IMF’s Global Integrated Monetary and Fiscal (GIMF) model for the first three years by country. The blue lines show the effects of tariffs under standard assumptions. The red lines show the effects of temporary tariffs and higher pass-through. The yellow lines show the effects when about 50 percent of global trade is invoiced in US dollars. Data labels in the figure use International Organization for Standardization (ISO) country codes. “Other Asia” includes BGD, BRN, IDN, IND, KHM, LAO, MMR, MYS, PHL, SGP, THA, and VNM. CMX = Canada and Mexico; GVCs = global value chains.

depreciates by less relative to others on account of the exchange rate management assumption. Exchange rate movements are considerably smaller if tariff increases are perceived as temporary, about one-third the size relative to the version of the model in which tariffs are perceived as permanent.

*Inflation.* The impact on inflation is uncertain (Figure 1.2.1, panel 2). In the first version, the effect is limited, except in China, which experiences a decrease of about 60 basis points in 2026 because of the managed exchange rate. Inflationary effects in the United States are offset by the appreciation of the dollar and some decline in markups. When tariffs are perceived to be temporary and import costs are fully passed on, US inflation increases by close to 50 basis points in 2025. The impact on inflation outside the United States is instead larger if the dollar plays a central role in the pricing of global trade, as the appreciation of the dollar raises production costs globally.

*Activity.* Tariffs have a large negative impact on global activity. The effect is largest for Canada and Mexico, China, and the United States (Figure 1.2.1, panel 3). The impact on China also reflects a less-than-full adjustment of the exchange rate. The negative impact on the United States is amplified in the version of GIMF in which tariffs are perceived to be temporary and import costs are fully passed on, because the resulting increase in inflation leads to a tightening of monetary policy. The euro area and Other Asia benefit slightly in the short run from trade diversion, but the effect depends on the currency used for invoicing global trade. Under dollar invoicing, the appreciation of the dollar weighs on global external demand, and other regions experience large losses as well. The world economy sees a negative hit to activity that ranges between 0.4 and 1 percent of world GDP by 2027.

**Medium- to Long-Term Effects**

All three models (GIMF, CP, and CFRT) are used to assess medium- to long-term impact (10 years), under the assumption that tariffs are permanent.

*Channels.* The first trade model (CP) emphasizes losses because tariffs move resources inefficiently across sectors. Losses in the second model (CFRT) tend to be larger because tariffs reduce access to foreign markets by the most productive firms, while leading to entry of less productive firms domestically. The third model (GIMF) emphasizes lower levels of capital accumulation from tariff-related distortions. In all models, tariffs imposed by large countries can create favorable terms-of-trade effects. Finally, results depend crucially on the ease with which importers can substitute across different exporters (trade elasticities) and across foreign and domestic producers (macro elasticities). Elasticities are greater in the two trade models than in GIMF.

*Trade.* Tariffs permanently reduce global trade and reallocate flows across countries (Table 1.2.1, panel 1). Canada, Mexico, China, and especially the United States see the largest declines in exports, in the latter country due in large part to the long-term real appreciation of the US dollar. Although China sees the largest tariff increase, the decline in

**Table 1.2.1. Long-Run Effects of Tariffs**  
(Percent deviation from a forecast with no tariffs)

	1. Real Exports			2. Real GDP		
	GIMF	Trade Models		GIMF	Trade Models	
		CP	CFRT		CP	CFRT
United States	-19.3	-21.8	-27.6	-1.3	-0.3	-0.9
China	-5.4	-4.9	-6.7	-1.1	-0.5	-0.7
Canada and Mexico	-5.7	-1.8	-6.0	-1.9	-0.5	-0.7
Euro Area	-1.1	0.0	-0.5	-0.6	0.0	-0.2
Other Asia	-1.6	-0.1	-0.3	-1.0	0.0	0.3
World	-5.1	-3.1	-4.2	-0.9	-0.2	-0.4

Sources: Caliendo and Parro (CP) 2015; Caliendo, Feenstra, Romalis, and Taylor (CFRT) 2023; and IMF staff estimates.  
Note: The table shows the percent deviation from a forecast with no tariffs. "Other Asia" includes Bangladesh, Brunei Darussalam, Cambodia, India, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. GIMF = IMF's Global Integrated Monetary and Fiscal model.

China's exports is mitigated by export diversion to other markets. Magnitudes are broadly similar across GIMF and the two trade models, despite each model emphasizing different channels.

*Output.* Tariffs generate global long-term output losses across all models (Table 1.2.1, panel 2). Canada and Mexico, China, and the United States are the most affected. The negative impact on the US is similar across GIMF (which captures well changes in the capital stock) and CFRT (which captures productivity losses due to misallocation). In GIMF, lower levels of capital accumulation weaken potential output; in CFRT, a reduction in market access prompts some firms to stop exporting, and less productive firms enter in import-competing sectors. The effect on the United States is smallest in CP, as relative to CFRT it does not account for productivity losses due to productive firms exiting. The impact on other regions varies across models, with GIMF showing large negative effects for the euro area and Other Asia, while trade models show relatively small effects for those regions. This is because of greater trade reallocation in the latter models, reflecting the larger elasticities of substitution, which create scope for countries less directly exposed, or facing smaller tariffs, to benefit from the reconfiguration of global trade. In GIMF, all countries are instead affected by tariff-induced distortions along global supply chains, which also explains why the negative impact on global output is greater. More generally, the combined effects from lower capital accumulation (captured by GIMF), sectoral misallocation (captured by the trade models), and prolonged trade policy uncertainty (not included in the simulations) would compound the losses for each region and could well offset any positive impact from trade reallocation.

## Commodity Special Feature: Market Developments and the Impact of AI on Energy Demand

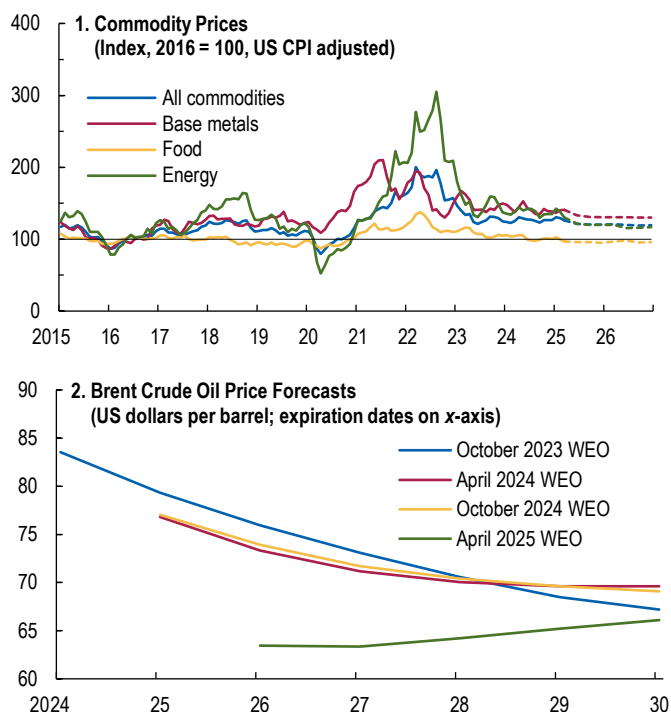
Primary commodity prices increased 1.9 percent between August 2024 and March 2025, with the rise driven by natural gas, precious metals, and beverage prices. In oil markets, prices fell amid concerns that a trade war could dampen global demand, adding to downward pressure from robust oil production growth outside OPEC+ (Organization of the Petroleum Exporting Countries plus selected nonmember countries, including Russia) and the unwinding of OPEC+ supply cuts. With the notable exception of gold prices, which continued to soar owing to geopolitical uncertainty, and prices of some staples like wheat, most commodity prices have dropped since the announcement of additional tariffs by the US administration on April 2. This Special Feature also analyzes the impact of artificial intelligence (AI) on energy demand.

### Commodity Market Developments

Oil prices declined 9.7 percent between August 2024 and March 2025 as trade war fears, strong non-OPEC+ supply growth, and the unwinding of OPEC+ cuts more than offset lingering supply risks. Oil prices then plummeted in early April amid escalating trade tensions, adding to an already-bearish outlook. This latest catalyst compounded weak fundamentals, with supply growth expected to likely outpace tepid global demand growth through 2025 and 2026. Demand concerns were exacerbated by sluggish Chinese demand, partly dented by the rising penetration of electric vehicles (EVs).

In this context, OPEC+ policy will be pivotal: Facing pressure to roll back its deep and sustained cuts, OPEC+ has decided to start gradually unwinding them despite a broader environment of falling prices. The harshest sanctions on Russia to date (imposed on January 10, 2025) have not materially disrupted oil flows. Russian oil, exported primarily to China and India,

Figure 1.SF.1. Commodity Market Developments



Sources: Bloomberg, L.P.; Haver Analytics; IMF, Primary Commodity Price System; International Energy Agency; and IMF staff calculations.

Note: In panel 1, latest actual CPI value is applied to forecasts, represented by the dashed portions of the graph lines. CPI = consumer price index; WEO = World Economic Outlook.

The contributors to this Special Feature are Christian Bogmans, Patricia Gomez-Gonzalez, Giovanni Melina (team co-lead), Jorge Miranda-Pinto, Andrea Paloschi, Andrea Pescatori (team lead), and Sneha Thube, with research assistance from Ganchimeg Ganpurev, Maximiliano Jerez Osses, and Joseph Moussa. This Special Feature is based on Bogmans and others (2025).

## COMMODITY SPECIAL FEATURE: MARKET DEVELOPMENTS AND THE IMPACT OF AI ON ENERGY DEMAND

has traded at a \$5–\$15 discount to Brent. Futures markets indicate that oil prices will average \$66.9 per barrel in 2025, a 15.5 percent decline, before falling to \$62.4 in 2026 (Figure 1.SF.1, panel 2). Risks to this outlook are balanced. Upside price risks from potential disruptions in oil supply from countries subject to sanctions or a de-escalation of trade barriers are offset by the possibility of a further escalation in the trade war and additional increases in OPEC+’s production schedule.

*Natural gas prices reversed course in the first week of April, beginning to decline alongside oil prices after a six-month period of gains.* Title Transfer Facility (TTF) trading hub prices in Europe rose 7.7 percent between August 2024 and March 2025 to \$13.1 a million British thermal units (MMBtu). This was above the historical average but well below the 2022 peak. Among other factors, a cold snap and various supply disruptions, including a halt of Russian gas to Europe through Ukraine at the beginning of January 2025, explained the upward trend. Similarly, harsh weather and a surge in demand for gas exports led to a doubling in Henry Hub prices. Weak demand from China, in contrast, kept Asian liquefied natural gas prices almost constant over the same period. Following the April 2 tariff announcement, gas prices reversed course, with concerns about future energy demand pushing gas prices down across the board. As of April 4, futures markets suggested that TTF prices will average \$12.5 a MMBtu in 2025, steadily decreasing to \$7.8 a MMBtu in 2030. Henry Hub prices are expected to decline from \$4.0 a MMBtu in 2025 to \$3.3 a MMBtu in 2030. Risks to this outlook are balanced.

*Metals prices rose amid safe-haven demand and supply disruptions until the end of March, but things changed abruptly on April 2.* The IMF’s metals price index increased by 11.2 percent between August 2024 and March 2025 (Figure 1.SF.1, panel 1), with the rise driven mainly by gold, aluminum, and copper prices. Among base metals, aluminum (12.7 percent) and copper prices (8.4 percent) increased the most because of supply concerns. Both metals also faced demand pressures from front-loading ahead of tariffs. Like those for energy, industrial metals prices dropped abruptly in the first week of April as trade tensions escalated. Futures markets now predict a downturn in prices for base metals, with price declines of 5.7, 4.5 and 14.3 percent for aluminum, copper, and iron ore, respectively, by the end of 2026. This stands in contrast to what has taken place regarding prices for precious metals: Gold prices have repeatedly set new records amid policy and geopolitical uncertainty, recently surpassing their historical high at \$3,000 a ton.

*Agricultural commodity prices increased as a result of adverse weather.* Between August 2024 and March 2025, the IMF’s food and beverages price index increased by 3.6 percent, with the rise driven by higher beverage prices. Cereal prices increased modestly, by 0.6 percent, as concerns over crop conditions for wheat and corn subsided. Coffee prices jumped 33.8 percent, with the IMF coffee index reaching historic highs in February because of weather-related supply concerns in Brazil. Meanwhile, rice prices fell 26.0 percent as crop conditions improved in India and other parts of Asia. New trade barriers imposed in April had heterogeneous effects on agricultural prices. The price of income-elastic (coffee) and trade-sensitive (soybeans) crops have declined sharply, whereas prices for staples like corn and wheat are so far less affected. Upside risks stem from trade disruptions and adverse weather; larger-than-expected harvests, trade war intensification, and broader uncertainty are the main downside risks.

## Power Hungry: How AI Will Drive Energy Demand

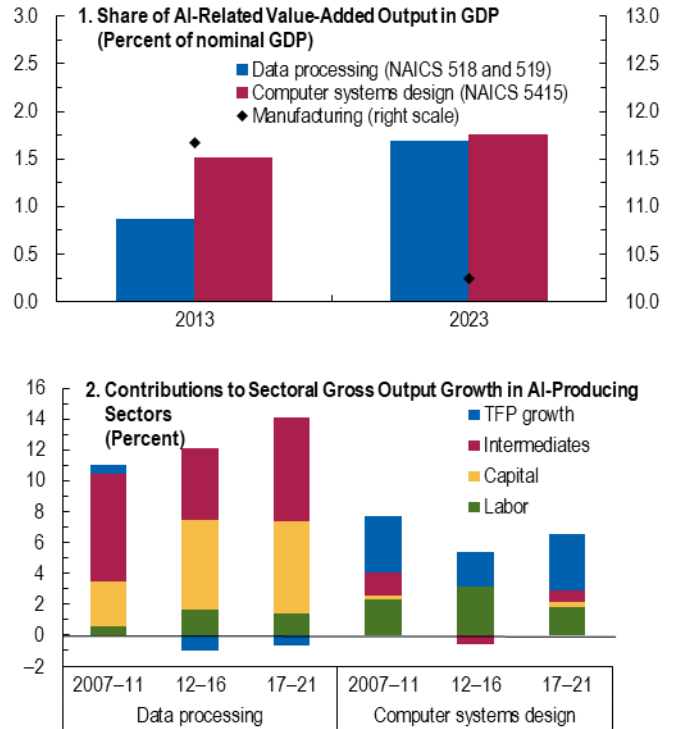
The rapid development and adoption of generative AI models, including large language models, require building more data centers that consume vast amounts of electricity. Large language models' costs have two main components: a large fixed cost for training the models and variable costs for operating and responding to user prompts.<sup>2</sup> Because substantial computational resources are required during both stages, electricity consumption represents a critical input for companies delivering AI services. In northern Virginia, which features the largest concentration of data centers in the world, the square footage of server-filled warehouses is now roughly equivalent to the floor space of eight Empire State Buildings (Cushman & Wakefield 2024).

Using a multicountry computable general equilibrium (CGE) model, IMF-ENV (Chateau and others 2025), this Special Feature seeks to answer the following questions: (1) How fast have sectors involved in the development and delivery of AI-related services grown in recent years, and what has happened to their electricity consumption? (2) How does the projected electricity demand from AI by 2030 compare with other drivers of demand, such as EVs? (3) What is the impact on energy prices and the mix of electricity sources under alternative policy scenarios? (4) What will be the impact of data centers' growth on carbon emissions?

### The Growing Macroeconomic Relevance of AI-Producing Sectors

In the US, AI-producing sectors' value added quadrupled from \$278 billion (in constant 2017 dollars) to \$1.13 trillion between 2010 and 2023, a rate much faster than those for private nonfarm and manufacturing value added. As a result, these sectors' share in total US GDP increased from 2.4 percent in 2013 to 3.5 percent in 2023, with the data-processing sector nearly doubling its share in the same period. Meanwhile, the share of manufacturing declined by 1.5 percentage points (Figure 1.SF.2, panel 1). This fast growth of AI-producing sectors was driven by remarkable gains in labor productivity, with value added per employee in the data-processing sector growing about four times faster than that in the whole economy over the past 10 years

Figure 1.SF.2. The Growing Macroeconomic Relevance of AI-Producing Sectors



Sources: Haver Analytics; BEA-BLS Integrated Industry-level Production Accounts (KLEMS); and IMF staff calculations.  
 Note: NAICS = North American Industry Classification System; TFP = total factor productivity.

<sup>2</sup> Large fixed costs create economies of scale that concentrate AI development among a few large players (Korinek and Vipra 2024), although this pool has expanded recently as more variation in the cost structure of large language models has emerged.

## COMMODITY SPECIAL FEATURE: MARKET DEVELOPMENTS AND THE IMPACT OF AI ON ENERGY DEMAND

(see Online Annex Figure 1.1.2, panel 1 in Online Annex 1.1).<sup>3</sup> This productivity growth was largely the result of elevated investment in physical capital and the complementarity of intermediate inputs, contrary to what was the case in computer systems design, in which labor and total factor productivity (TFP) contributed significantly to output growth (Figure 1.SF.2, panel 2). Hence, the high output per employee in data centers, compared with that in other sectors, is the result of rapid capital accumulation, which has increased energy consumption as an intermediate input.

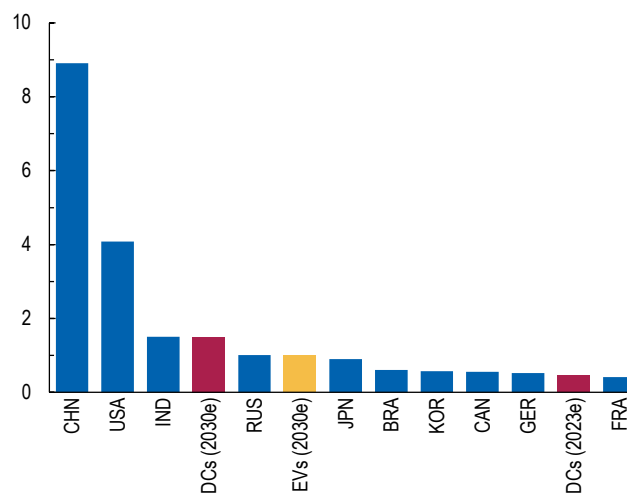
### AI's Demand for Electricity

Electricity costs make up 13–15 percent of total costs for data center companies, whereas they account for only 0.8–1.5 percent for semiconductor firms and AI service companies. However, the latter have almost doubled the share of electricity costs in their total costs in less than five years (see Online Annex Figure 1.1.3 in Online Annex 1.1). As these companies integrate vertically by building, operating, and leasing their own data centers, that share will likely continue to grow.

The broader implications for global electricity consumption are substantial. Worldwide electricity consumption from data centers and AI is estimated to have reached 400–500 terawatt-hours (TWh) in 2023, more than double the level in 2015 (OPEC 2024). For the United States, where growth is the fastest, electricity demand from data centers is expected to increase from 178 TWh in 2024 to 606 TWh in 2030 under a medium-demand scenario (McKinsey & Company 2024a). By 2030, AI-driven global electricity consumption could hit 1,500 TWh, conceivably making its level comparable to that of India's current total electricity consumption, the third highest in the world. This projected electricity demand from AI by 2030 is about 1.5 times higher than expected demand from EVs, another emerging source of electricity demand (Figure 1.SF.3).

Recent developments in the AI industry have increased uncertainty about its future compute and energy demands. Companies such as DeepSeek are achieving breakthroughs in algorithmic efficiency that may lower the computational costs of AI models faster than previously anticipated. However, these efficiency gains may be counterbalanced by greater use of compute by companies pursuing better-performing models (Hoffmann and others 2022). Adding to this

**Figure 1.SF.3. AI's Demand for Electricity**  
(Thousands of terawatt-hours; electricity demand for data centers compared with that in top electricity-consuming countries in 2023)



Sources: International Energy Agency (IEA); Organization of the Petroleum Exporting Countries (OPEC); and IMF staff calculations.  
Note: Estimates for data centers (DCs) and electric vehicles (EVs) are for the world and come from OPEC and the IEA, respectively. Data labels in the figure use International Organization for Standardization (ISO) country codes. e = estimate.

<sup>3</sup> All online annexes are available at [www.imf.org/en/Publications/WEO](http://www.imf.org/en/Publications/WEO).

complexity is the recent emergence of reasoning models—which require more compute in their deployment—and possibly greater AI use driven by lower costs and availability of open-source models.

### The Effects of Increased Demand for Electricity

In the IMF-ENV model, the impact of AI is captured by an increase in information technology (IT) sectors' TFP in China, the United States, and Europe to match the expected increase in data center power demand between 2025 and 2030 (see Online Annex Table 1.1.1. in Online Annex 1.1). This growth is projected at constant annual rates of 22, 13, and 10 percent, respectively (JP Morgan 2024; McKinsey & Company 2024a, 2024b).

Three scenarios are simulated here: (1) a *baseline* scenario, which excludes the AI-related TFP shock but reflects energy and emissions projections consistent with policies introduced through 2024; (2) an *AI scenario under current energy policies*, which models the AI-related TFP shock, assuming that the composition of electricity generation remains identical to that in the *baseline* scenario; and (3) an *AI scenario under alternative energy policies*, under which the share of renewables in total electricity generation is aligned with regions' long-term strategies using feed-in tariffs for renewables, though in practice policy choices will be guided by countries' preferences.<sup>4</sup> Results for both AI scenarios are reported as deviations from the *baseline* scenario, unless stated otherwise.

The AI shock increases electricity consumption by the IT sector, and power producers are expected to expand generation. The composition of electricity generation by technologies varies across countries and is based on their relative production costs and current policies. By 2030, in the *AI scenario under current energy policies*, total electricity supply increases by 8 percent in the United States (525 TWh), 3 percent in Europe (145 TWh), and 2 percent in China (237 TWh) relative to the baseline scenario. In the *AI scenario under alternative energy policies*, the increase in total electricity supply is kept the same, but its composition shifts in favor of renewables. In China, the United States, and Europe, generation from solar and wind sources offsets about 166 TWh, 58 TWh, and 35 TWh of generation, respectively, from other sources, including largely coal power in China and natural gas in the US (Figure 1.SF.4, panel 1).

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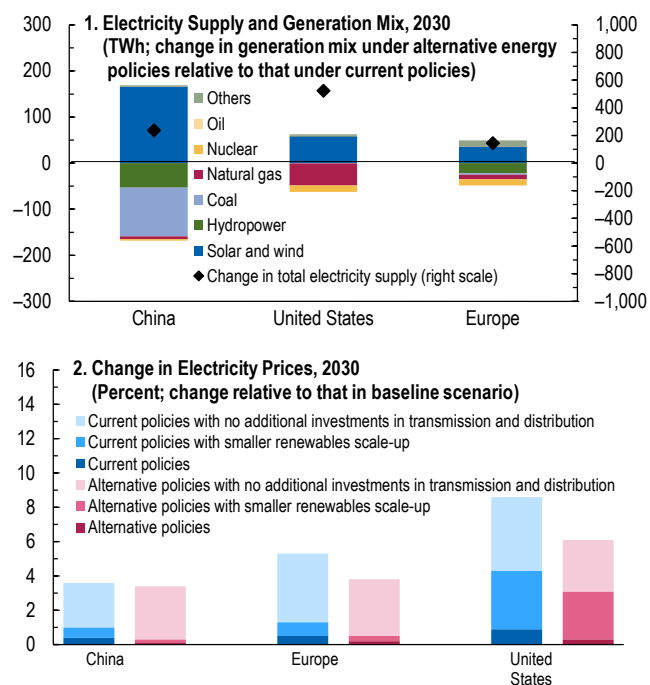
<sup>4</sup> AI expansion relies on electricity growth, so countries' energy policies should focus on supply. Different supply-side policies affect prices, GDP, and revenue (Chateau, Jaumotte, and Schwerhoff 2024). Feed-in tariffs for solar photovoltaic (PV) and wind are simulated owing to their historical inclusion in policy packages and because these renewables are cost competitive with fossil fuels in these regions (IRENA 2024).

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In both scenarios, the rising marginal costs of electricity supply mean that the increase in generation is less than proportional to economy-wide demand growth, which drives electricity prices up. At the same time, strong commitment of major AI players to resolving medium-term power supply rigidities<sup>5</sup> could lead to a smaller increase in electricity prices. In this case, the surge would be 0.9 percent in the United States, 0.45 percent in Europe, and 0.35 percent in China under current energy policies (Figure 1.SF.4, panel 2). However, material pressure on prices would be added if the renewables scale-up slows from recent trends and if further investments are not made in transmission and distribution capacities (relative to those in the *baseline*). The price increase in the *AI scenario under current energy policies* could escalate up to 5.3 percent in China, 8.6 percent in the United States, and 3.6 percent in Europe by 2030 (Figure 1.SF.4, panel 2), adding to price pressures coming from many other sources.<sup>6</sup>

In addition, without further investments in transmission and distribution, support for the expansion of the AI sector would require redirecting electricity from other economic activities. Such a shift would pose significant challenges, especially for energy-intensive manufacturing sectors. In the United States, for example, annual growth in the value added of these sectors would fall by an average of 0.3 percentage point compared with that in the *baseline* scenario, reducing annual GDP growth by 0.1 percentage point. The electricity price increase is more muted in the *AI scenario under alternative energy policies* owing to feed-in tariffs on solar and wind. The tariffs reduce the generation price of these technologies, which have relatively low production costs and a higher share in total electricity generation compared with those in the *AI scenario under current energy policies*.

Figure 1.SF.4. The Effects of Increased Demand for Electricity



Sources: IMF, IMF-ENV model; and IMF staff calculations.

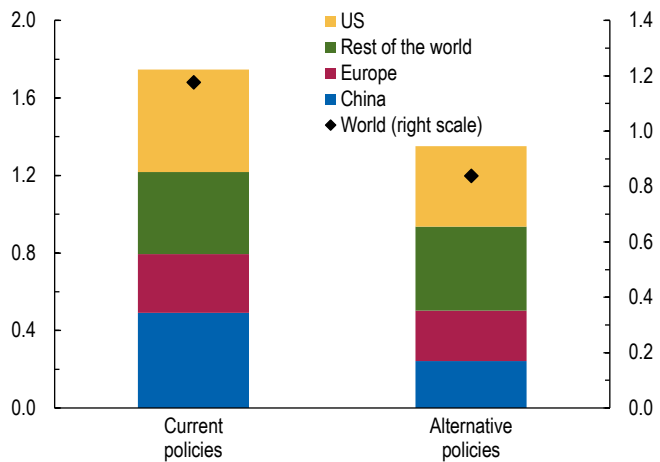
Note: In panel 1, the left axis shows the change in generation mix under alternative energy policies relative to current policies in terawatt-hours (TWh). Feed-in tariffs increase generation from solar and wind sources. The right axis shows the total increase in electricity supply relative to the baseline scenario in TWh, which is identical under both current energy policies and alternative energy policies.

<sup>5</sup> Public investments are being made in the United States for upgrading transmission and distribution infrastructure to meet rising electricity demand. Innovative solutions like power coupling (Engel, Posner, and Varadarajan 2025) and small modular nuclear reactors could offer flexibility, making constraints less restrictive than expected. Most new nuclear capacity in the United States is expected online no earlier than the early 2030s.

<sup>6</sup> Chandramowli and others (2024) estimate a 19 percent rise in US wholesale electricity prices from 2025 to 2028 because of increased demand driven not only by data centers, but also by electrification of buildings and transportation, battery and fuel cell manufacturing, AI, and cryptocurrency mining.

In both AI scenarios, global and regional greenhouse gas (GHG) emissions increase because of the increased energy demand resulting from the expanded IT sector and its spillovers to the economy. In the *AI scenario under current energy policies*, the 2030 increase is 5.5, 3.7, and 1.2 percent in the US, Europe, and China, respectively, with a global average increase of 1.2 percent (Figure 1.SF.5). In cumulative terms, this translates into a global GHG emissions increase of 1.7 gigatons (Gt) between 2025 and 2030, which is similar to Italy’s energy-related GHG emissions over a five-year period. Notably, in the *AI scenario under alternative energy policies*, even a modest decarbonization of the power sector limits the total cumulative global GHG emissions increase to 1.3 Gt by 2030, which is 24 percent less than in the *AI scenario under current energy policies*.<sup>7</sup>

**Figure 1.SF.5. Emission Impacts of Expansion in IT Sector**  
(MtCO<sub>2e</sub>; cumulative greenhouse gas emissions; Percent change relative to that in baseline, right scale)



Sources: IMF, IMF-ENV model; and IMF staff calculations.  
Note: The left axis shows the total greenhouse gas emissions increase in metric tons of carbon dioxide equivalent (MtCO<sub>2e</sub>) between 2025 and 2030 resulting from information technology (IT) sector expansion in selected regions. The right axis shows the total increase in global emissions in 2030 relative to the baseline emissions as a result of this expansion.

In the *AI scenario under current energy policies*, the AI shock raises the average annual growth rate of global GDP by 0.5 percentage point between 2025 and 2030, in line with previous IMF estimates ranging between 0.1 percentage point and 0.8 percentage point (April 2024 *World Economic Outlook*). The impact is greater in countries where the projected growth rate of the IT sector and its relative importance in the economy are higher. In the *AI scenario under alternative energy policies*, these gains are slightly reduced because of the feed-in tariff policies. The total fiscal costs of these tariffs range from 0.3 percent to 0.6 percent of GDP across countries and are financed through increased lump-sum taxes, which slightly reduce household consumption. However, the growth benefits from AI expansion far outweigh these costs, resulting in similar average annual GDP growth across both scenarios.

In summary, although the AI-induced expansion of the IT sector is expected to raise global GDP, the development also comes at the cost of higher carbon emissions. Drawing on a median social cost of carbon estimate of \$39 per ton—based on 147 published studies with more than 1,800 estimates (Moore and others 2024)—the additional social cost of 1.3 to 1.7 Gt of carbon-dioxide-equivalent emissions is about \$50.7 billion to \$66.3 billion, or 1.3 percent to 1.7 percent of the AI-driven increase in real world GDP between 2025 and 2030.

<sup>7</sup> This estimate is conservative compared with that of Stern and Romani (2025), who project that AI’s energy demand could contribute between 0.4 and 1.6 Gt of carbon dioxide equivalent annually by 2035.

## **Conclusions and Policy Implications**

As AI technologies continue to evolve and proliferate, demand for computational power and electricity is poised for a significant surge. Despite challenges related to higher electricity prices and GHG emissions, the gains to global GDP from AI are likely to outweigh the costs of the additional emissions. The economic benefits, however, may not be evenly distributed across countries and among different groups within societies, potentially exacerbating existing inequalities.

Increasing electricity demand from the IT sector will stimulate overall supply, which—if sufficiently responsive—will lead to a small increase in electricity prices. More sluggish supply responses will lead to much stronger price surges. In the United States, the country with the largest expected surge in electricity demand, AI expansion alone could increase electricity prices by up to 9 percent, adding to price pressures coming from many other sources.

In addition, under current energy policies, the AI-driven rise in electricity demand could add 1.7 Gt in global greenhouse gas emissions between 2025 and 2030, an amount similar to Italy’s energy-related GHG emissions over a five-year period. The social cost of these extra emissions is minor compared with the expected economic gains from AI, yet it still adds to the worrying buildup of worldwide emissions.

Demand for computing and electricity from AI service producers is subject to wide uncertainty, which may delay energy investments, causing underinvestment and higher prices. Policymakers and businesses must work together to ensure AI achieves its full potential, while minimizing societal costs.

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

	Real GDP			Consumer Prices <sup>1</sup>			Current Account Balance <sup>2</sup>			Unemployment <sup>3</sup>		
	Projections			Projections			Projections			Projections		
	2024	2025	2026	2024	2025	2026	2024	2025	2026	2024	2025	2026
<b>Europe</b>	<b>1.8</b>	<b>1.4</b>	<b>1.6</b>	<b>7.8</b>	<b>6.2</b>	<b>4.3</b>	<b>2.5</b>	<b>1.9</b>	<b>1.7</b>	...	...	...
<b>Advanced Europe</b>	<b>1.0</b>	<b>1.0</b>	<b>1.3</b>	<b>2.3</b>	<b>2.2</b>	<b>2.0</b>	<b>3.1</b>	<b>2.6</b>	<b>2.4</b>	<b>5.8</b>	<b>5.9</b>	<b>5.8</b>
Euro Area <sup>4, 5</sup>	0.9	0.8	1.2	2.4	2.1	1.9	2.8	2.3	2.1	6.4	6.4	6.3
Germany	-0.2	0.0	0.9	2.5	2.1	1.9	5.7	5.2	5.0	3.4	3.5	3.2
France	1.1	0.6	1.0	2.3	1.3	1.6	0.4	0.2	-0.2	7.4	7.7	7.4
Italy	0.7	0.4	0.8	1.1	1.7	2.0	1.1	0.9	0.9	6.6	6.7	6.7
Spain	3.2	2.5	1.8	2.9	2.2	2.0	3.0	2.4	2.2	11.3	11.1	11.0
The Netherlands	1.0	1.4	1.4	3.2	2.8	2.3	9.9	10.4	10.5	3.7	3.8	4.0
Belgium	1.0	0.8	1.0	4.3	3.2	2.1	-0.9	-1.1	-1.3	5.7	5.9	5.7
Ireland	1.2	2.3	2.1	1.3	1.9	1.7	17.2	11.6	11.0	4.3	4.5	4.7
Austria	-1.2	-0.3	0.8	2.9	3.2	1.7	2.4	2.6	2.8	5.4	5.6	5.5
Portugal	1.9	2.0	1.7	2.7	1.9	2.1	2.2	1.7	1.5	6.5	6.4	6.3
Greece	2.3	2.0	1.8	3.0	2.4	2.1	-6.9	-6.5	-5.9	10.1	9.4	9.0
Finland	-0.1	1.0	1.4	1.0	2.0	2.0	0.3	-0.5	-0.6	8.4	8.1	7.6
Slovak Republic	2.0	1.3	1.7	3.2	3.7	2.9	-2.8	-1.9	-1.5	5.4	5.8	5.9
Croatia	3.8	3.1	2.7	4.0	3.7	2.6	-1.2	-0.7	-0.6	5.5	5.3	5.3
Lithuania	2.7	2.8	2.5	0.9	3.5	2.8	2.5	2.0	1.7	7.1	6.6	6.1
Slovenia	1.6	1.8	2.4	2.0	2.6	2.3	4.4	3.6	3.3	3.7	3.9	4.0
Luxembourg	1.0	1.6	2.2	2.3	2.2	2.1	13.8	8.8	7.8	5.7	6.1	6.2
Latvia	-0.4	2.0	2.5	1.3	2.4	2.4	-2.1	-2.5	-2.4	6.9	6.7	6.6
Estonia	-0.3	0.7	1.8	3.7	5.8	3.9	-1.1	-2.6	-2.4	7.5	7.1	6.9
Cyprus	3.4	2.5	2.7	2.3	2.3	2.0	-6.8	-7.3	-7.8	4.9	4.8	5.0
Malta	6.0	3.9	3.9	2.4	2.1	1.9	6.1	6.2	6.1	3.1	3.1	3.1
United Kingdom	1.1	1.1	1.4	2.5	3.1	2.2	-3.4	-3.7	-3.7	4.3	4.5	4.4
Switzerland	1.3	0.9	1.6	1.1	0.2	0.5	5.1	5.0	5.2	2.4	2.8	2.8
Sweden	1.0	1.9	2.2	2.0	2.1	2.0	7.4	6.8	6.0	8.4	8.2	8.0
Czech Republic	1.1	1.6	1.8	2.4	2.5	2.0	1.8	-0.1	-0.6	2.8	2.5	2.4
Norway	2.1	2.1	1.7	3.1	2.6	2.2	17.1	15.9	15.1	4.0	3.9	3.9
Denmark	3.7	2.9	1.8	1.3	1.9	2.1	13.0	12.6	12.4	2.9	3.0	3.0
Iceland	0.5	2.0	2.4	5.9	3.5	2.7	-2.5	-1.9	-1.2	3.4	4.0	4.0
Andorra	3.4	1.9	1.6	3.1	2.2	1.8	15.1	16.9	16.9	1.4	1.6	1.8
San Marino	0.7	1.0	1.3	1.2	2.0	2.0	6.3	4.0	3.3	4.4	4.4	4.5
<b>Emerging and Developing Europe <sup>6</sup></b>	<b>3.4</b>	<b>2.1</b>	<b>2.1</b>	<b>16.8</b>	<b>13.5</b>	<b>8.7</b>	<b>0.0</b>	<b>-1.0</b>	<b>-1.0</b>	...	...	...
Russia	4.1	1.5	0.9	8.4	9.3	5.5	2.9	1.9	1.8	2.5	2.8	3.5
Türkiye	3.2	2.7	3.2	58.5	35.9	22.8	-0.8	-1.2	-1.2	8.7	9.4	9.2
Poland	2.9	3.2	3.1	3.7	4.3	3.4	0.1	-0.3	-0.7	2.8	2.9	3.0
Romania	0.9	1.6	2.8	5.6	4.6	3.1	-8.3	-7.6	-7.4	5.4	5.4	5.2
Ukraine <sup>7</sup>	3.5	2.0	4.5	6.5	12.6	7.7	-7.0	-15.9	-10.6	13.1	11.6	10.2
Hungary	0.5	1.4	2.6	3.7	4.9	3.6	2.2	1.0	1.1	4.5	4.6	4.2
Belarus	4.0	2.8	2.0	5.7	5.5	5.8	-2.8	-2.8	-2.9	3.0	2.9	2.9
Bulgaria	2.8	2.5	2.7	2.6	3.7	2.3	0.2	-1.5	-1.0	4.2	4.1	4.1
Serbia	3.9	3.5	4.2	4.7	4.0	3.3	-6.3	-5.8	-5.7	8.6	8.5	8.4

Source: IMF staff estimates.

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

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

<sup>2</sup> Percent of GDP.

<sup>3</sup> Percent. National definitions of unemployment may differ.

<sup>4</sup> Current account position corrected for reporting discrepancies in intra-area transactions.

<sup>5</sup> Based on Eurostat's harmonized index of consumer prices except for Slovenia.

<sup>6</sup> Includes Albania, Bosnia and Herzegovina, Kosovo, Moldova, Montenegro, and North Macedonia.

<sup>7</sup> See the country-specific note for Ukraine in the "Country Notes" section of the Statistical Appendix.

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

	Real GDP			Consumer Prices <sup>1</sup>			Current Account Balance <sup>2</sup>			Unemployment <sup>3</sup>		
	2024	Projections		2024	Projections		2024	Projections		2024	Projections	
		2025	2026		2025	2026		2025	2026		2025	2026
<b>Asia</b>	<b>4.6</b>	<b>3.9</b>	<b>4.0</b>	<b>2.1</b>	<b>1.8</b>	<b>2.0</b>	<b>2.6</b>	<b>2.0</b>	<b>1.8</b>	...	...	...
<b>Advanced Asia</b>	<b>1.5</b>	<b>1.2</b>	<b>1.4</b>	<b>2.6</b>	<b>2.1</b>	<b>1.9</b>	<b>5.4</b>	<b>4.5</b>	<b>4.5</b>	<b>2.9</b>	<b>3.0</b>	<b>3.0</b>
Japan	0.1	0.6	0.6	2.7	2.4	1.7	4.8	3.4	3.3	2.6	2.6	2.6
Korea	2.0	1.0	1.4	2.3	1.8	1.8	5.3	3.5	3.6	2.8	3.0	3.0
Australia	1.0	1.6	2.1	3.2	2.5	3.5	-1.9	-3.1	-3.4	4.0	4.3	4.5
Taiwan Province of China	4.3	2.9	2.5	2.2	1.8	1.6	15.7	18.5	19.6	3.4	3.4	3.4
Singapore	4.4	2.0	1.9	2.4	1.3	1.5	17.5	17.2	17.0	2.0	2.0	1.9
Hong Kong SAR	2.5	1.5	1.9	1.7	1.9	2.2	13.0	11.4	11.0	3.0	3.5	3.4
New Zealand	-0.5	1.4	2.7	2.9	2.0	2.0	-6.0	-4.9	-4.7	4.7	5.3	5.3
Macao SAR	8.8	3.6	3.5	0.7	0.9	1.3	31.7	30.0	28.9	1.8	1.7	1.7
<b>Emerging and Developing Asia</b>	<b>5.3</b>	<b>4.5</b>	<b>4.6</b>	<b>2.0</b>	<b>1.7</b>	<b>2.0</b>	<b>1.5</b>	<b>1.1</b>	<b>0.9</b>	...	...	...
China	5.0	4.0	4.0	0.2	0.0	0.6	2.3	1.9	1.7	5.1	5.1	5.1
India <sup>4</sup>	6.5	6.2	6.3	4.7	4.2	4.1	-0.8	-0.9	-1.4	4.9	4.9	4.9
Indonesia	5.0	4.7	4.7	2.3	1.7	2.5	-0.6	-1.5	-1.6	4.9	5.0	5.1
Thailand	2.5	1.8	1.6	0.4	0.7	0.9	2.1	1.2	1.2	1.0	1.0	1.0
Vietnam	7.1	5.2	4.0	3.6	2.9	2.5	6.1	3.2	1.9	2.2	2.0	2.0
Malaysia	5.1	4.1	3.8	1.8	2.4	2.2	1.7	1.6	1.8	3.2	3.2	3.2
Philippines	5.7	5.5	5.8	3.2	2.6	2.9	-3.8	-3.4	-3.2	3.8	4.5	4.5
<b>Other Emerging and Developing Asia <sup>5/</sup></b>	<b>3.8</b>	<b>3.5</b>	<b>5.2</b>	<b>9.5</b>	<b>9.9</b>	<b>6.5</b>	<b>-0.2</b>	<b>-0.6</b>	<b>-0.9</b>	...	...	...
<i>Memorandum</i>												
ASEAN- <sup>5</sup> <sup>6</sup>	4.6	4.0	3.9	2.0	1.7	2.2	2.6	2.1	2.0	...	...	...
Emerging Asia <sup>7</sup>	5.4	4.6	4.6	1.6	1.4	1.8	1.6	1.2	0.9	...	...	...

Source: IMF staff estimates.

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

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

<sup>2</sup> Percent of GDP.

<sup>3</sup> Percent. National definitions of unemployment may differ.

<sup>4</sup> See the country-specific note for India in the "Country Notes" section of the Statistical Appendix.

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

<sup>6</sup> Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

<sup>7</sup> Emerging Asia comprises China, India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

## CHAPTER 1 GLOBAL PROSPECTS AND POLICIES

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

	Real GDP			Consumer Prices <sup>1</sup>			Current Account Balance <sup>2</sup>			Unemployment <sup>3</sup>		
	Projections			Projections			Projections			Projections		
	2024	2025	2026	2024	2025	2026	2024	2025	2026	2024	2025	2026
<b>North America</b>	<b>2.6</b>	<b>1.6</b>	<b>1.7</b>	<b>3.1</b>	<b>3.0</b>	<b>2.5</b>	<b>-3.5</b>	<b>-3.3</b>	<b>-2.9</b>	...	...	...
United States	2.8	1.8	1.7	3.0	3.0	2.5	-3.9	-3.7	-3.2	4.0	4.2	4.2
Mexico	1.5	-0.3	1.4	4.7	3.5	3.2	-0.3	-0.5	-1.1	2.7	3.8	3.8
Canada	1.5	1.4	1.6	2.4	2.0	2.1	-0.5	-0.1	-0.3	6.4	6.6	6.5
Puerto Rico <sup>4</sup>	1.0	-0.8	-0.1	1.6	2.1	1.9	...	...	...	6.2	6.5	6.1
<b>South America <sup>5</sup></b>	<b>2.2</b>	<b>2.5</b>	<b>2.4</b>	<b>23.5</b>	<b>9.1</b>	<b>5.5</b>	<b>-1.3</b>	<b>-1.5</b>	<b>-1.5</b>	...	...	...
Brazil	3.4	2.0	2.0	4.4	5.3	4.3	-2.8	-2.3	-2.2	6.9	7.2	7.3
Argentina	-1.7	5.5	4.5	219.9	35.9	14.5	1.0	-0.4	-0.3	7.2	6.3	6.0
Colombia	1.7	2.4	2.6	6.6	4.7	3.1	-1.8	-2.3	-2.4	10.2	10.0	9.8
Chile	2.6	2.0	2.2	3.9	4.4	3.2	-1.5	-2.1	-2.4	8.5	8.1	8.1
Peru	3.3	2.8	2.6	2.4	1.7	1.9	2.2	1.7	1.3	6.4	6.5	6.5
Ecuador	-2.0	1.7	2.1	1.5	1.3	1.5	5.8	3.4	2.6	3.4	4.0	3.8
Venezuela	5.3	-4.0	-5.5	49.0	180.0	225.0	2.4	-0.1	-0.5	...	...	...
Bolivia	1.3	1.1	0.9	5.1	15.1	15.8	-4.3	-2.5	-3.0	5.0	5.1	5.1
Paraguay	4.0	3.8	3.5	3.8	3.7	3.5	-3.9	-2.4	-2.7	5.8	5.7	5.7
Uruguay	3.1	2.8	2.6	4.8	5.5	5.3	-1.0	-1.5	-1.7	8.2	8.0	8.0
<b>Central America <sup>6</sup></b>	<b>3.9</b>	<b>3.8</b>	<b>3.9</b>	<b>2.3</b>	<b>2.9</b>	<b>3.4</b>	<b>-0.9</b>	<b>-0.9</b>	<b>-1.3</b>	...	...	...
<b>Caribbean <sup>7</sup></b>	<b>12.1</b>	<b>4.2</b>	<b>8.6</b>	<b>6.3</b>	<b>6.3</b>	<b>5.9</b>	<b>4.1</b>	<b>0.6</b>	<b>0.3</b>	...	...	...
<i>Memorandum</i>												
Latin America and the Caribbean <sup>8</sup>	2.4	2.0	2.4	16.6	7.2	4.8	-0.9	-1.1	-1.4	...	...	...
Eastern Caribbean Currency Union <sup>9</sup>	3.9	3.5	2.7	2.3	1.9	2.0	-10.4	-9.9	-8.3	...	...	...

Source: IMF staff estimates.

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

<sup>1</sup> Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix. Aggregates exclude Venezuela.

<sup>2</sup> Percent of GDP.

<sup>3</sup> Percent. National definitions of unemployment may differ.

<sup>4</sup> Puerto Rico is a territory of the United States, but its statistical data are maintained on a separate and independent basis.

<sup>5</sup> See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.

<sup>6</sup> Central America refers to CAPDR (Central America, Panama, and the Dominican Republic) and comprises Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

<sup>7</sup> The Caribbean comprises Antigua and Barbuda, Aruba, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

<sup>8</sup> Latin America and the Caribbean comprises Mexico and economies from the Caribbean, Central America, and South America. See the country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.

<sup>9</sup> Eastern Caribbean Currency Union comprises Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines, as well as Anguilla and Montserrat, which are not IMF members.

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

	Real GDP			Consumer Prices <sup>1</sup>			Current Account Balance <sup>2</sup>			Unemployment <sup>3</sup>		
	2024	Projections		2024	Projections		2024	Projections		2024	Projections	
	2024	2025	2026	2024	2025	2026	2024	2025	2026	2024	2025	2026
<b>Middle East and Central Asia</b>	<b>2.4</b>	<b>3.0</b>	<b>3.5</b>	<b>14.4</b>	<b>11.1</b>	<b>9.9</b>	<b>2.0</b>	<b>-0.1</b>	<b>-0.4</b>	...	...	...
<b>Oil Exporters <sup>4</sup></b>	<b>2.5</b>	<b>2.6</b>	<b>3.1</b>	<b>8.5</b>	<b>10.3</b>	<b>10.0</b>	<b>4.2</b>	<b>1.4</b>	<b>0.9</b>	...	...	...
Saudi Arabia	1.3	3.0	3.7	1.7	2.0	2.0	-0.5	-4.0	-4.3	3.5	...	...
Iran	3.5	0.3	1.1	32.6	43.3	42.5	2.7	0.9	1.3	7.8	9.5	9.2
United Arab Emirates	3.8	4.0	5.0	1.7	2.1	2.0	9.1	6.6	6.4	...	...	...
Kazakhstan	4.8	4.9	4.3	8.7	9.9	9.4	-1.3	-3.6	-3.7	4.7	4.6	4.6
Algeria	3.5	3.5	3.0	4.0	3.7	3.6	-1.4	-3.9	-4.6	...	...	...
Iraq	0.3	-1.5	1.4	2.6	2.5	2.7	2.0	1.5	1.5	...	...	...
Qatar	2.4	2.4	5.6	1.1	1.2	1.4	17.2	10.8	10.3	...	...	...
Kuwait	-2.8	1.9	3.1	2.9	2.5	2.2	29.5	22.7	19.3	...	...	...
Azerbaijan	4.1	3.5	2.5	2.2	5.7	4.5	7.8	7.8	4.1	5.4	5.3	5.3
Oman	1.7	2.3	3.6	0.6	1.5	2.0	2.2	-1.5	-2.5	...	...	...
Turkmenistan	2.3	2.3	2.3	4.8	7.0	8.0	3.1	2.0	0.6	...	...	...
Bahrain	2.8	2.8	3.0	0.9	1.0	1.5	4.9	3.3	1.7	5.9	...	...
<b>Oil Importers <sup>5,6</sup></b>	<b>2.3</b>	<b>3.6</b>	<b>4.1</b>	<b>24.1</b>	<b>12.4</b>	<b>9.7</b>	<b>-3.9</b>	<b>-3.8</b>	<b>-3.5</b>	...	...	...
Egypt	2.4	3.8	4.3	33.3	19.7	12.5	-5.4	-5.8	-3.7	7.4	7.7	7.7
Pakistan	2.5	2.6	3.6	23.4	5.1	7.7	-0.5	-0.1	-0.4	8.3	8.0	7.5
Morocco	3.2	3.9	3.7	0.9	2.2	2.3	-1.4	-2.0	-2.2	13.3	13.2	12.9
Uzbekistan	6.5	5.9	5.8	9.6	8.8	7.2	-5.0	-5.0	-4.8	5.5	5.0	4.5
Tunisia	1.4	1.4	1.4	7.0	6.1	6.5	-1.7	-2.7	-3.1	...	...	...
Sudan <sup>7</sup>	-23.4	-0.4	8.8	176.8	100.0	63.2	-3.5	-3.6	-8.6	60.8	62.0	59.7
Jordan	2.5	2.6	2.9	0.2	3.6	2.6	-5.8	-5.5	-5.8	...	...	...
Georgia	9.4	6.0	5.0	1.1	3.6	3.2	-4.4	-4.4	-4.7	13.9	13.9	13.9
Armenia	5.9	4.5	4.5	0.3	3.2	3.0	-3.9	-4.5	-4.8	13.0	13.5	14.0
Tajikistan	8.4	6.7	5.0	3.5	4.3	5.5	4.7	0.9	-2.1	...	...	...
Kyrgyz Republic	9.0	6.8	5.3	5.0	7.0	5.7	-31.1	-8.5	-7.5	4.0	4.0	4.0
Mauritania	4.6	4.4	3.7	2.3	3.5	4.0	-5.8	-5.1	-4.8	...	...	...
West Bank and Gaza <sup>7</sup>	...	...	...	52.9	...	...	...	...	...	...	...	...
<i>Memorandum</i>												
Caucasus and Central Asia	5.4	4.9	4.3	6.7	8.1	7.4	-1.3	-2.0	-2.6	...	...	...
Middle East, North Africa, Afghanistan, and Pakistan <sup>6</sup>	1.9	2.6	3.4	15.7	11.7	10.3	2.5	0.2	0.0	...	...	...
Middle East and North Africa	1.8	2.6	3.4	14.6	12.7	10.7	2.8	0.3	0.1	...	...	...
Israel <sup>7,8</sup>	0.9	3.2	3.6	3.1	2.7	2.0	3.1	2.8	2.9	3.0	2.9	3.2

Source: IMF staff estimates.

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

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

<sup>2</sup> Percent of GDP.

<sup>3</sup> Percent. National definitions of unemployment may differ.

<sup>4</sup> Includes Libya and Yemen.

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

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

<sup>7</sup> See the country-specific notes for Israel, Sudan, and West Bank and Gaza in the "Country Notes" section of the Statistical Appendix.

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

## CHAPTER 1 GLOBAL PROSPECTS AND POLICIES

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

	Real GDP			Consumer Prices <sup>1</sup>			Current Account Balance <sup>2</sup>			Unemployment <sup>3</sup>		
	2024	Projections		2024	Projections		2024	Projections		2024	Projections	
		2025	2026		2025	2026		2025	2026		2025	2026
<b>Sub-Saharan Africa</b>	<b>4.0</b>	<b>3.8</b>	<b>4.2</b>	<b>18.3</b>	<b>13.3</b>	<b>12.9</b>	<b>-1.7</b>	<b>-2.5</b>	<b>-2.2</b>	...	...	...
<b>Oil Exporters <sup>4</sup></b>	<b>3.4</b>	<b>2.7</b>	<b>3.1</b>	<b>29.8</b>	<b>23.6</b>	<b>29.5</b>	<b>6.4</b>	<b>3.8</b>	<b>2.7</b>	...	...	...
Nigeria	3.4	3.0	2.7	33.2	26.5	37.0	9.1	6.9	5.2	...	...	...
Angola	4.5	2.4	2.1	28.2	22.0	16.4	5.4	2.1	1.4	...	...	...
Gabon	3.1	2.8	2.6	1.2	1.5	2.0	4.5	2.2	0.6	...	...	...
Chad	1.5	1.7	3.2	5.7	3.9	3.5	-1.3	-3.4	-2.8	...	...	...
Equatorial Guinea	1.9	-4.2	0.0	3.2	4.0	3.5	-2.4	-1.7	-2.4	...	...	...
<b>Middle-Income Countries <sup>5</sup></b>	<b>3.1</b>	<b>3.4</b>	<b>3.6</b>	<b>6.4</b>	<b>5.4</b>	<b>4.8</b>	<b>-2.4</b>	<b>-2.5</b>	<b>-2.3</b>	...	...	...
South Africa	0.6	1.0	1.3	4.4	3.8	4.5	-0.6	-1.2	-1.4	32.8	32.8	32.7
Kenya	4.5	4.8	4.9	4.5	4.1	4.9	-3.7	-3.9	-4.2	...	...	...
Ghana	5.7	4.0	4.8	22.9	17.2	9.4	1.6	1.6	1.3	...	...	...
Côte d'Ivoire	6.0	6.3	6.4	3.5	3.0	2.2	-4.2	-3.6	-2.1	...	...	...
Cameroon	3.6	3.6	4.0	4.5	3.4	3.0	-3.3	-2.8	-3.9	...	...	...
Senegal	6.7	8.4	4.1	0.8	2.0	2.0	-12.1	-8.2	-6.2	...	...	...
Zambia	4.0	6.2	6.8	15.0	14.2	9.2	-1.7	0.5	2.6	...	...	...
<b>Low-Income Countries <sup>6</sup></b>	<b>6.0</b>	<b>5.7</b>	<b>6.3</b>	<b>23.3</b>	<b>13.3</b>	<b>7.2</b>	<b>-6.0</b>	<b>-6.5</b>	<b>-5.0</b>	...	...	...
Ethiopia	8.1	6.6	7.1	21.7	21.5	12.2	-4.2	-4.8	-3.2	...	...	...
Tanzania	5.4	6.0	6.3	3.2	4.0	4.0	-3.1	-3.0	-2.9	...	...	...
Democratic Republic of the Congo	6.5	4.7	5.2	17.7	8.9	7.2	-4.1	-2.9	-2.5	...	...	...
Uganda	6.3	6.1	7.6	3.3	4.2	4.7	-7.3	-6.4	-4.2	...	...	...
Mali	4.4	4.9	5.1	3.2	3.0	2.0	-6.1	-5.1	-1.6	...	...	...
Burkina Faso	4.4	4.3	4.5	4.2	3.0	2.5	-6.4	-2.1	-2.0	...	...	...

Source: IMF staff estimates.

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

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

<sup>2</sup> Percent of GDP.

<sup>3</sup> Percent. National definitions of unemployment may differ.

<sup>4</sup> Includes Republic of Congo and South Sudan.

<sup>5</sup> Includes Benin, Botswana, Cabo Verde, the Comoros, Eswatini, Lesotho, Mauritius, Namibia, São Tomé and Príncipe, and Seychelles.

<sup>6</sup> Includes Burundi, Central African Republic, Eritrea, The Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mozambique, Niger, Rwanda, Sierra Leone, Togo, and Zimbabwe.

**Annex Table 1.1.6. Summary of World Real per Capita Output**  
(Annual percent change; in constant 2021 international dollars at purchasing power parity)

	Average									Projections	
	2007–16	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
<b>World</b>	<b>2.0</b>	<b>2.5</b>	<b>2.5</b>	<b>1.8</b>	<b>-3.9</b>	<b>5.6</b>	<b>2.7</b>	<b>2.4</b>	<b>2.7</b>	<b>1.8</b>	<b>2.0</b>
<b>Advanced Economies</b>	<b>0.8</b>	<b>2.1</b>	<b>1.8</b>	<b>1.5</b>	<b>-4.4</b>	<b>5.8</b>	<b>2.4</b>	<b>0.9</b>	<b>1.2</b>	<b>0.9</b>	<b>1.2</b>
United States	0.7	1.8	2.4	2.1	-3.0	5.7	2.0	2.1	1.9	1.2	1.1
Euro Area <sup>1</sup>	0.4	2.4	1.5	1.4	-6.4	6.3	3.1	-0.1	0.5	0.5	0.9
Germany	1.1	2.3	0.8	0.8	-4.2	3.6	0.6	-1.1	-0.5	-0.2	0.8
France	0.3	2.0	1.3	1.7	-7.8	6.4	2.1	0.8	0.8	0.4	0.7
Italy	-0.9	1.8	1.0	0.6	-8.6	9.7	5.2	0.8	0.8	0.5	0.9
Spain	0.0	2.6	1.8	1.1	-11.1	6.5	4.9	1.5	2.2	1.2	0.6
Japan	0.5	1.8	0.8	-0.2	-3.9	3.0	1.3	2.0	0.6	1.0	1.1
United Kingdom	0.4	2.0	0.8	1.1	-10.7	8.3	4.3	-0.9	0.0	0.1	0.6
Canada	0.4	1.8	1.3	0.4	-6.1	5.3	2.5	-1.3	-1.4	0.4	1.6
Other Advanced Economies <sup>2</sup>	1.9	2.5	2.1	1.3	-2.2	6.0	1.9	0.6	1.7	1.4	1.5
<b>Emerging Market and Developing Economies</b>	<b>3.7</b>	<b>3.3</b>	<b>3.4</b>	<b>2.4</b>	<b>-3.1</b>	<b>5.9</b>	<b>3.1</b>	<b>3.6</b>	<b>3.7</b>	<b>2.7</b>	<b>2.8</b>
Emerging and Developing Asia	6.5	5.6	5.6	4.5	-1.4	7.1	4.1	5.5	4.7	4.0	4.1
China	8.4	6.3	6.4	5.7	2.2	8.5	3.2	5.5	5.1	4.2	4.2
India <sup>3</sup>	5.4	5.6	5.3	2.8	-6.7	8.8	6.9	8.3	5.5	5.3	5.4
Emerging and Developing Europe	2.1	3.6	3.4	2.3	-1.9	7.5	1.9	3.8	3.7	2.3	2.1
Russia	1.5	1.6	2.7	2.1	-2.5	6.2	-1.1	4.4	4.3	1.8	1.2
Latin America and the Caribbean	1.2	0.3	0.2	-0.9	-8.0	6.6	3.5	1.6	1.6	1.3	1.6
Brazil	1.2	0.7	1.1	0.6	-3.9	4.3	2.6	2.8	3.0	1.6	1.6
Mexico	0.2	0.9	1.0	-1.3	-9.1	5.4	2.9	2.4	0.6	-1.1	0.6
Middle East and Central Asia	1.4	0.0	0.9	0.1	-4.3	2.6	3.2	0.1	4.6	1.1	1.7
Saudi Arabia	0.2	0.8	5.9	1.5	-8.1	7.7	2.8	-5.3	-3.3	1.0	1.7
Sub-Saharan Africa	1.7	0.1	0.6	0.4	-4.3	2.0	1.5	1.0	1.2	1.2	1.5
Nigeria	2.8	-1.8	-0.7	-0.4	-4.3	1.1	0.7	0.3	0.9	0.6	0.3
South Africa	0.6	-0.3	0.0	-1.3	-7.5	3.8	0.7	-0.8	-0.9	-0.5	-0.2
<i>Memorandum</i>											
European Union	0.7	2.8	2.1	1.8	-5.7	6.6	3.4	0.1	0.8	0.9	1.3
ASEAN-5 <sup>4</sup>	3.6	4.0	3.8	3.2	-5.5	3.3	4.5	3.1	3.6	3.0	3.0
Middle East and North Africa	1.1	-0.5	0.5	-0.3	-4.5	2.8	3.2	0.0	-0.3	0.8	1.6
Emerging Market and Middle-Income Economies	3.9	3.6	3.7	2.7	-2.9	6.6	3.4	4.0	3.6	3.0	3.1
Low-Income Developing Countries	2.8	2.0	2.2	2.5	-2.7	1.7	2.3	1.6	3.0	1.9	2.8

Source: IMF staff estimates.

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

<sup>1</sup> Data are calculated as the sum of those for individual euro area countries.

<sup>2</sup> Excludes the Group of Seven (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

<sup>3</sup> See the country-specific note for India in the "Country Notes" section of the Statistical Appendix.

<sup>4</sup> ASEAN-5 comprises Indonesia, Malaysia, the Philippines, Singapore, and Thailand.

*As the global population ages, economies worldwide face significant demographic shifts with far-reaching implications. This chapter explores the rise of the “silver economy,” focusing on three key areas: the extent of healthy aging and its impact on labor markets, the broader economic implications of demographic changes, and the role of targeted policies in mitigating the adverse effects of aging. The analysis reveals that although population aging poses challenges such as slower growth and increased fiscal pressures, healthier aging trends offer a silver lining by boosting labor force participation, extending working lives, and enhancing productivity. The chapter underscores the importance of policies that support healthy aging, increase labor force participation among older individuals, and close gender gaps in the workforce. By leveraging strategies related to these policies, countries can harness the potential of the silver economy to boost growth and rebuild fiscal buffers amid demographic headwinds.*

## Introduction

Unprecedented demographic changes expected throughout this century are creating increasingly pressing issues for all countries to navigate. Global population growth will slow from 1.1 percent per year before the COVID-19 pandemic to basically zero in 2080–2100 (Figure 2.1). An ongoing decline in fertility and an increase in longevity are expected to bring sharp changes in the age structure of economies, with the average age of the world’s population projected to increase by 11 years between 2020 and the end of the century. These forces are driving the rise of the “silver economy,” as the share of the older population—ages 65 and older—is increasing rapidly throughout the world, with far-reaching implications for economies and societies.

The authors of this chapter are Bertrand Gruss (co-lead), Eric Huang, Andresa Lagerborg, Diaa Noureldin (co-lead), and Galip Kemal Ozhan, with support from Pedro de Barros Gagliardi and Ziyang Han. Adrien Auclert, Hannes Malmberg, and Matthew Rognlie were external consultants. The chapter benefited from comments by Andrew Scott and internal seminar participants and reviewers.

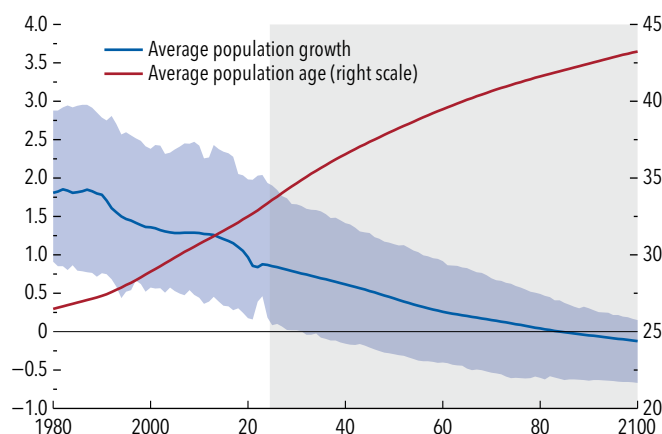
Population aging has often been linked to gloomy prospects for economic growth and public finances. The fall in the proportion of working-age individuals may depress labor supply and output growth (Gagnon, Johannsen, and López-Salido 2021; Maestas, Mullen, and Powell 2023). Slower population growth can also lead to fewer ideas and less innovation, and thus slower productivity growth (Aksoy and others 2019; Jones 2022). A higher dependency ratio, wherein fewer workers support more retirees, can strain public pension systems and increase health care spending (Lee 2016).

However, individuals are not only living for longer but generally also aging in better health (Scott 2021, 2023; Kotschy and Bloom 2023). Globally, life expectancy has increased by about 4½ years over the past two decades. Importantly, healthy life expectancy has increased at a similar pace, with additional years largely free from chronic illnesses. Recent studies have documented significant improvements in the physical and cognitive abilities of individuals over the age of 50 in some advanced economies, though with notable heterogeneity across socioeconomic groups (Freedman and others 2013; Abeliasky and Strulik 2019; Old and Scott 2023). Healthier aging could thus continue to boost labor supply by extending working lives and enhancing older workers’ productivity, offering a bright spot amid the rise of the silver economy.

Against this backdrop, this chapter pursues the following intertwined objectives: (1) assessing the extent to which cohorts are aging in better health and its impact on labor market outcomes, (2) evaluating the global economic implications of demographic shifts and healthy-aging trends, and (3) exploring how targeted policies can help mitigate the negative effects of population aging.

To achieve these objectives, the chapter seeks to answer the following questions:

- **Global demographic transition:** How have demographic trends evolved globally? How fast and uneven is the pace of aging across different countries?

**Figure 2.1. Global Population Aging***(Percent, left axis; years, right axis)*

Sources: United Nations World Population Prospects; and IMF staff calculations.

Note: The area shaded in blue denotes the interquartile range for population growth across all countries.

- *Healthy aging:* Is there evidence that individuals in later-born cohorts are healthier than those in earlier-born cohorts at the same age? How do healthy-aging trends differ across countries and socioeconomic groups? Has healthy aging increased the labor market attachment and productivity of older individuals?
- *Economic implications of global population aging:* What are the likely implications of population aging for growth, interest rates, public finances, and external balances? How do these implications differ across countries given uneven demographic trends? To what extent can longer and more productive working lives as a result of healthy aging offset the economic and fiscal challenges of population aging?
- *The role of policies:* How can policies help generate growth tailwinds to mitigate the adverse economic impacts of demographic transitions?

To answer these questions, the chapter first relies on microsurvey data from approximately 1 million individuals from 29 advanced and 12 emerging market economies over 2000–22 to establish the extent of healthy-aging trends and their association with labor market outcomes. It then employs a multicountry, overlapping-generations general equilibrium model covering 69 economies—representing about two-thirds of global output and the world’s population—to assess the economic implications of global aging through the end

of the century. After baseline projections under current policies are established, the model is used to assess the potential impact of targeted progrowth policies to cushion against the growth and fiscal implications of aging.

The chapter’s main findings are as follows:

- *Economies worldwide are aging rapidly as a result of declining fertility and rising life expectancy, with the pace of aging varying significantly across regions.* No longer confined to advanced economies, aging is accelerating in many emerging market and middle-income economies. Meanwhile, the window for reaping demographic dividends in younger, low-income countries is gradually closing.
- *In many countries, people not only are living longer but are also aging in better health, which is associated with longer and more productive working lives.* Alongside increases in longevity, the functional capacity of older individuals has improved over time. More recent cohorts of older individuals are physically stronger and cognitively abler than earlier cohorts at the same age. Notably, when cognitive capacities are the focus, “the 70s are the new 50s”: Data from a sample of 41 advanced and emerging market economies indicate that, on average, a person who was 70 in 2022 had the same cognitive ability as a 53-year-old in 2000. Over the course of a decade, this pace of improvement in cognitive abilities is associated with an increase of approximately 20 percentage points in the likelihood that individuals remain engaged in the labor market, either by working or actively seeking employment, along with an increase of about six hours in average weekly hours worked and a 30 percent rise in labor earnings, conditional on being employed.
- *Although healthy aging will partly offset the negative impact of demographic headwinds, the growth of global output will slow significantly through the 21st century, and many countries will need sizable efforts to stabilize public-debt-to-GDP ratios.* Ongoing increases in the labor supply and improvements in the human capital of older individuals because of healthy aging are expected to contribute about 0.4 percentage point annually to global GDP growth over 2025–50. Despite this tailwind, average global annual output growth under current policies is projected to decline by 1.1 percentage points during the same period, compared with the 2016–18 average. Demographic trends alone are expected to account for almost three-fourths of this decline. Lower growth, combined with an increasing share

of older individuals with higher accumulated savings in large economies, is projected to exert downward pressure on interest rates. Still, most countries are likely to face a worse interest-growth differential than in the recent past, and many will need higher primary balances than they registered in 2016–18 to keep debt ratios stable from 2030 onward. Uneven demographic trends are also likely to exert widening pressure on external global positions through the end of the century.

- *A multifaceted policy approach can increase labor supply, boost growth, and ease fiscal pressures amid global population aging.* Lifelong policies to support the human capital of workers in late adulthood (that is, people who are between age 50 and retirement age), including health promotion and prevention measures, can significantly counter the effect of population aging on growth. In addition, raising labor force participation among the 65-and-older age group—by gradually increasing the effective retirement age in line with improvements in life expectancy—and closing gender gaps where they remain large would provide significant growth tailwinds in many countries. A combination of labor supply policies could boost global annual output growth by about 0.6 percentage point over the next 25 years, offsetting almost three-fourths of the drag from demographics during that period. The fiscal dividends from progrowth policies would enable many countries to rebuild buffers and create space for critical spending needs. Expanding access to international financial markets through credit and capital market reforms, alongside stronger governance and institutions, would allow younger, low-income countries to reap demographic dividends before the window for doing so closes and offset potential losses from migration outflows to older, labor-scarce economies.

The chapter examines the implications of population aging for growth, interest rates, external balances, and public finances but does not cover all relevant aspects. Notably, it abstracts from shifts in consumer demand and sectoral reallocations driven by aging, as well as the implications for the financial sector, house prices, and urbanization. The analysis also abstracts from endogenous technological responses to aging—such as automation and artificial intelligence (AI)—which could mitigate some of the negative growth effects.

## Uneven Pace of Global Population Aging

Advancements in health care, public health measures, and improvements in living standards in past decades have contributed to significant declines in mortality rates across the world. Lower mortality rates in middle and old age have resulted in significant increases in life expectancy and longevity. These trends, together with falling birth rates, are leading to significant changes in the age structure of economies.

Under current demographic projections, economies around the world are progressively crossing their “demographic turning point”—the year when the share of the working-age population in their total population begins to decline—typically marking a transition from a demographic dividend to a demographic drag (Bloom, Canning, and Sevilla 2003). By 2035, all advanced economies and the largest emerging markets will have crossed this threshold (Figure 2.2, panel 1). By 2070, most low-income countries will have experienced similar shifts.

At the same time, increased longevity is contributing to the rise of the silver economy, because the share of the older population is projected to increase rapidly (Figure 2.2, panel 2). Although the rise in the share of older individuals is steepest in the “early agers”—including the largest advanced economies and emerging markets in Europe and Asia—the relatively younger Latin American economies, as well as the world’s youngest regions (Africa and the Middle East), will also experience a sharp rise in the share of the older population.

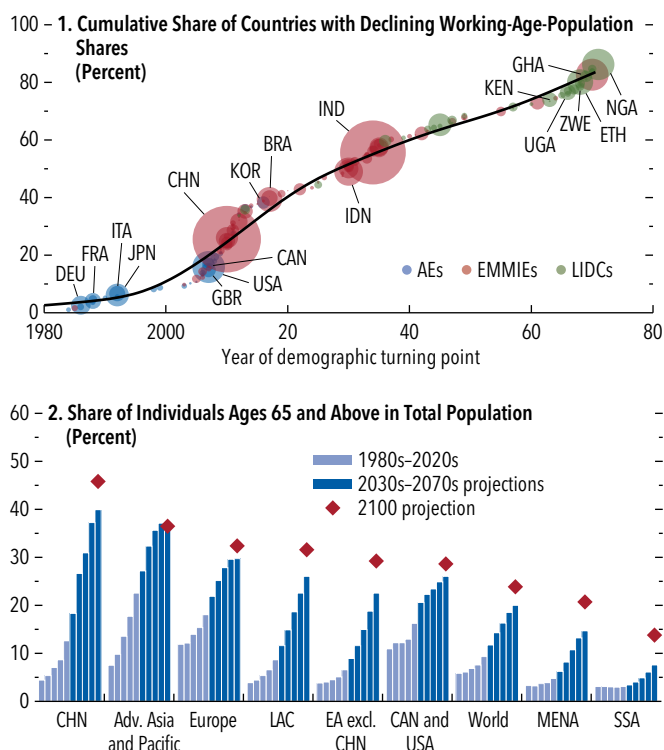
Aging is no longer a concern limited to advanced economies; it is a universal trend whose implications all countries will navigate throughout this century. And the window for low-income countries to reap demographic dividends is gradually closing.

## Healthy Aging and Implications for Labor Markets

Because longevity is a key driver of changes in the age structure of economies, an important question is whether individuals are aging in better health. Is there evidence that the functional ability of older individuals has been increasing over time? How broad-based are these gains across different economies? And what are the implications for labor markets?

To tackle these questions, this section uses micro-data from surveys of individuals ages 50 and above,

**Figure 2.2. Global Demographic Trends**



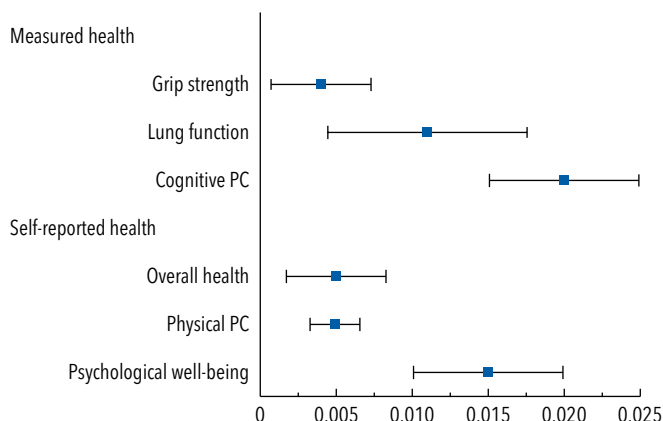
Sources: United Nations World Population Prospects; and IMF staff calculations.  
 Note: In panel 1, a demographic turning point marks the year when the share of the working-age population (ages 15–64) peaks and starts to decline. Bubble size indicates the country's population relative to the global population in the year of its demographic turning point. In panel 2, the bars denote the share of the older population (ages 65 and above) in the total population by the end of the respective decade. Data labels in the figure use International Organization for Standardization (ISO) country codes. AEs = advanced economies; Adv. Asia and Pacific = advanced Asia and Pacific; EA = emerging Asia; EMMIEs = emerging market and middle-income economies; excl. = excluding; LAC = Latin America and the Caribbean; LIDCs = low-income and developing countries; MENA = Middle East and North Africa; SSA = sub-Saharan Africa.

conducted over 2000–22 in 41 advanced and emerging market economies (see Online Annex 2.1 for details).<sup>1</sup> The surveys ask for information on various dimensions of physical, cognitive, and mental health, as well as the incidence of 18 chronic diseases (for example, arthritis, heart conditions, diabetes, cancer, psychological disorders) and individuals' health behaviors (for example, smoking, alcohol consumption, physical activity, obesity). Among *measured health indicators* are physical capacity metrics (grip strength and lung function) and various measures of cognitive ability (memory, orientation, verbal fluency, and basic mathematics). *Self-reported health indicators* include overall health

<sup>1</sup>All online annexes are available at [www.imf.org/en/Publications/WEO](http://www.imf.org/en/Publications/WEO).

**Figure 2.3. Healthy-Aging Trends, 2000–22**

(Regression estimates, trend coefficient)



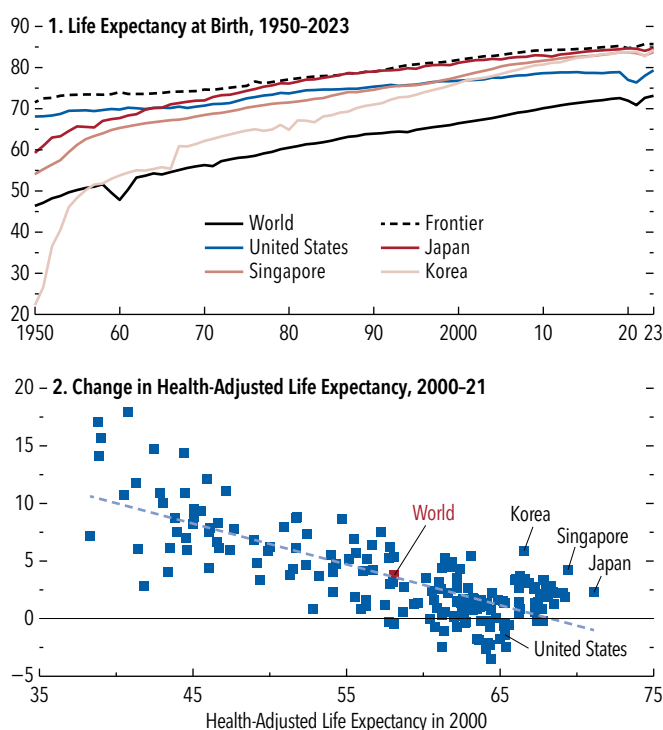
Sources: Gateway to Global Aging Data; national microdata sources; and IMF staff calculations.  
 Note: The figure shows the coefficient from ordinary least squares regressions of health indicators of individuals ages 50 and older on the survey year, with individuals' age, gender, education, household wealth, and country fixed effects controlled for. Squares represent point estimates, whereas bars represent 90 percent confidence intervals. PC = principal component.

status, various aspects of physical functionality (ease of performing activities of daily living, such as dressing and eating, and instrumental activities of daily living, such as managing money and shopping for groceries; frequency of pain; and hearing ability), and a composite measure of psychological well-being. Not surprisingly, all these indicators capturing the functional capacity of individuals tend to decline with age (Online Annex Figure 2.2.2). However, a key question is whether, for a given age, they have been improving across cohorts.

### Healthy Aging amid Persistent Heterogeneity

Are successive generations experiencing better health at older ages, consistent with the concept of healthy aging? The findings indicate a broad-based healthy-aging phenomenon, as evidenced by a range of physical, cognitive, and mental health indicators showing improvement over time when other covariates are controlled for (Figure 2.3). Healthy-aging gains appear to be most prominent in regard to cognitive functions. The estimated trend for the first principal component of cognitive indicators suggests that, on average and after individuals' socioeconomic characteristics (such as age, gender, education, and wealth) and country fixed effects are controlled for, the cognitive abilities of a

**Figure 2.4. Life Expectancy and Cross-Country Convergence (Years)**

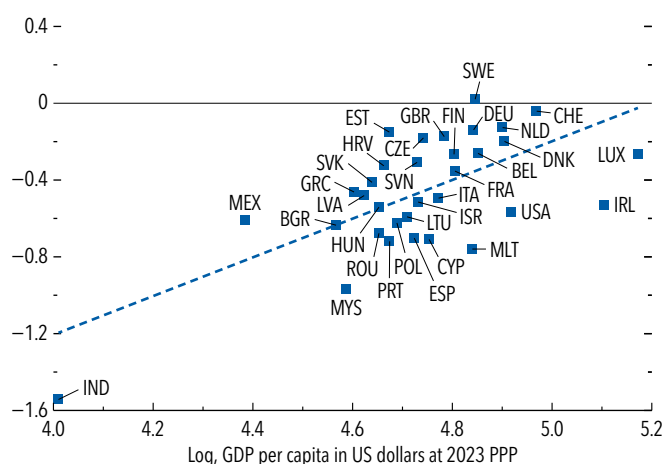


Sources: United Nations World Population Prospects; World Health Organization; and IMF staff calculations.  
 Note: World average is population-weighted, based on 183 countries. "Frontier" = maximum life expectancy across countries.

person aged 70 in 2022 are comparable to those of a person who was 53 in 2000. The trend is also positive and statistically significant, albeit somewhat weaker, in regard to other health measures and for a composite "frailty" health index (like the one used in Abeliasky and Strulik 2019; Abeliasky, Erel, and Strulik 2020; Old and Scott 2023). On average, the frailty of a 70-year-old person in 2022 corresponded to that of a person who was 56 in 2000 (Online Annex 2.2). The fact that improvements in the area of cognitive skills have been significant and large is particularly relevant as there is evidence that people tend to work in less physically demanding roles at the workplace as they age (Online Annex Figure 2.2.7).

Although these trends are encouraging, another important question is how broad-based these healthy-aging gains have been across countries and socioeconomic groups. A simple inspection of life expectancy across countries does point to some global convergence in longevity. First, average life expectancy across countries has been gradually catching up to

**Figure 2.5. Cognitive Capacity (Regression estimates, cognitive health score, country fixed effects)**



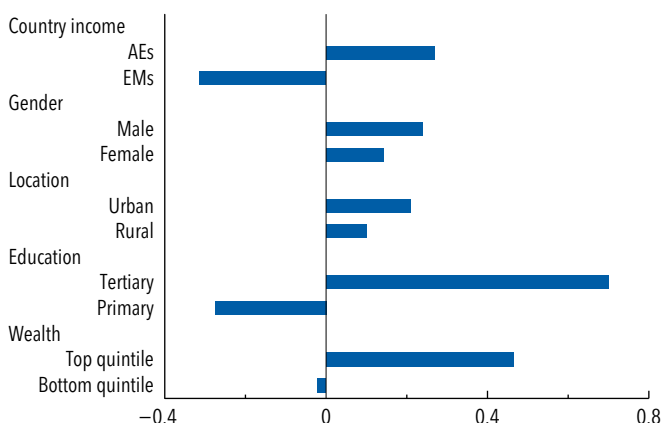
Sources: Gateway to Global Aging Data; national microdata sources; and IMF staff calculations.  
 Note: The vertical axis shows country fixed effects from ordinary least squares regressions of the cognitive health score of individuals ages 50 and older on the survey year, with individuals' age, gender, education, and household wealth controlled for. Cognitive health score is the first principal component of cognitive indicators, standardized to mean zero, standard deviation one. The regression sample period is 2000–22. Data labels in the figure use International Organization for Standardization (ISO) country codes. PPP = purchasing power parity.

the life expectancy frontier (Figure 2.4, panel 1; note that setbacks in the 1960s and 2020s shown in the figure were due to global pandemics). For instance, Japan, Korea, and Singapore—among the countries with the highest longevity today—had very different life expectancies in the 1950s. Second, countries with lower health-adjusted life expectancies—defined as the average number of years that a person can expect to live in good health—at the start of the 21st century have experienced, on average, faster improvements than other countries over the past two decades (Figure 2.4, panel 2).

However, survey-based data reveal important cross-country differences in the functional capacity of older individuals. If cognitive indicators are the focus, the analysis shows that although individuals' cognitive health is positively associated with their countries' GDP per capita, there is notable variation across countries (Figure 2.5). Among Nordic countries, for instance, Sweden has a higher cognitive health score than Denmark and Finland. Meanwhile, despite a comparable GDP per capita and higher health care spending, the United States systematically lags behind Nordic countries on measured health indicators. Also, cognitive health scores of older

**Figure 2.6. Cognitive Health Inequalities**

(Cognitive health score, average)



Sources: Gateway to Global Aging Data; national microdata sources; and IMF staff calculations.

Note: The figure shows average health cognitive scores of individuals ages 50 and older by socioeconomic group. Cognitive health score is the first principal component of cognitive indicators, standardized to mean zero, standard deviation one. T-tests indicate that the differences in means are statistically significant for all socioeconomic categories. AEs = advanced economies; EMs = emerging markets.

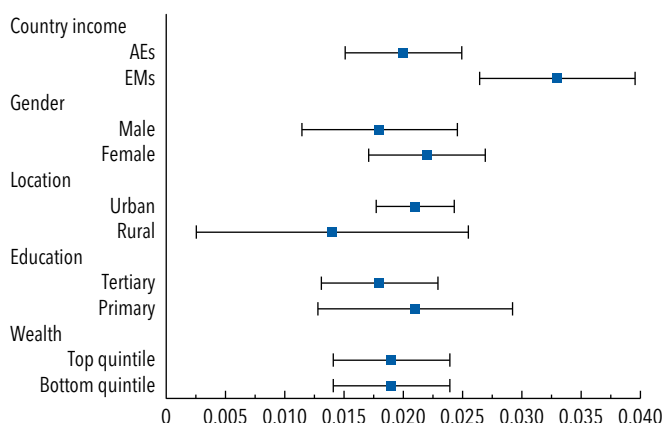
individuals from emerging market economies are lower than those from advanced economies after individuals' socioeconomic characteristics are controlled for (Figure 2.6).

Within countries, health disparities are related to socioeconomic characteristics. Average health scores are significantly lower for individuals in rural locations, individuals with at most primary education, and lower-wealth households (Figure 2.6). In turn, although faster improvements in healthy aging in emerging markets (compared with advanced economies) suggest some cross-country “catching up,” the pace of health improvements across other dimensions has been similar despite widely varying initial conditions (Figure 2.7). This indicates that existing socioeconomic health disparities—related to gender, location, education, and wealth—have persisted.<sup>2</sup> Further analysis reveals that lifestyle factors, such as levels of physical activity, body mass

<sup>2</sup>Similarly, Old and Scott (2023) find that frailty has decreased over time in the United Kingdom, though at varying rates across socioeconomic groups, with the wealthiest experiencing the largest decreases. Abeliansky and Strulik (2019) show that health deficits have declined over time in a sample of European countries, but health inequalities have persisted. Abeliansky, Erel, and Strulik (2020) find that the time trend of health improvements in the United States is similar across regions and for men and women, but significantly lower for African Americans compared with Caucasians.

**Figure 2.7. Heterogeneity in Cognitive Health Trends**

(Regression estimates, trend coefficient)



Sources: Gateway to Global Aging Data; national microdata sources; and IMF staff calculations.

Note: The figure shows estimates from ordinary least squares regressions of cognitive health score of individuals ages 50 and older on the survey year, by socioeconomic group, with individuals' age, gender, education, wealth, and country fixed effects controlled for. Squares represent point estimates, whereas surrounding bars represent 90 percent confidence intervals. Cognitive health score is the first principal component of cognitive indicators, standardized to mean zero, standard deviation one. AEs = advanced economies; EMs = emerging markets.

index, and smoking, are significant determinants of the functional capacity of older individuals after age and socioeconomic characteristics are controlled for (Online Annex 2.2).

In summary, although there is some evidence of cross-country convergence, notable disparities in the physical and cognitive capabilities of older individuals persist, both within and across countries. Strengthening health care quality and expanding access, particularly for preventive care and for disadvantaged groups, and providing incentives for healthy lifestyles can help narrow these healthy-aging gaps. Singapore's remarkable increase in life expectancy, from 90th in the world in 1950 to first in 2018, underscores the variety of policies that can be effective, including subsidizing healthier food options, regulating sugar content in beverages, building widespread public fitness centers, introducing automobile congestion charges, and subsidizing housing in proximity to family to promote intergenerational social connections (Buettner 2012).

### Labor Market Implications of Healthy Aging

Have healthy-aging gains been associated with improvements in labor market outcomes of older

individuals? To shed light on this, the analysis investigates the effect of health indicators capturing the functional capacity of older individuals on measures of labor supply and labor earnings.

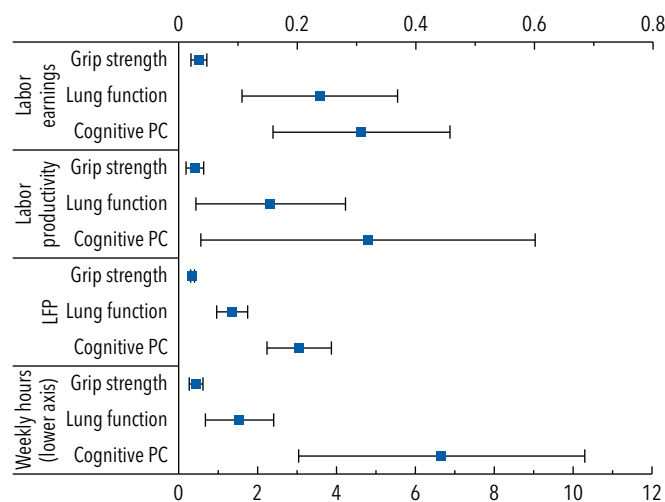
A simple regression analysis reveals that higher scores on the health indicators are associated with increased total labor earnings and labor productivity (proxied by hourly earnings), as well as with positive employment outcomes along both the extensive margin (labor force participation) and intensive margin (hours worked); see Online Annex Table 2.2.3. However, these associations may not necessarily reflect causal relationships. Some studies have argued that increasing the retirement age negatively affects health outcomes, especially for those in low-status occupations (Barschkett and others 2022; Abeliansky and Strulik 2023), in which case the estimated correlations between the two would need to be interpreted as lower bounds. Others find that working longer is beneficial for most people but negative for some, especially those in low-quality jobs (Calvo 2006). In addition, there could be unobserved drivers of both health and labor market outcomes that would bias the relationship between the two.

To address these concerns, the analysis here employs an instrumental-variables approach that exploits exogenous health shocks, proxied by the development of chronic diseases.<sup>3</sup> Given that smoking, poor nutrition, physical inactivity, and excessive alcohol use are key risk factors for most chronic diseases (Hacker 2024), the regression employed in the analysis controls for these lifestyle behaviors. The estimates remain statistically significant and are quantitatively larger than the simple correlations (Figure 2.8). In regard to economic magnitude, the results imply that average cognitive health gains observed for older-age individuals over a decade are associated with rises in labor earnings and labor productivity by about 30 percent, an increase in their likelihood of participating in the labor force by about 20 percentage points, and higher numbers of average weekly hours worked by about

<sup>3</sup>The identification strategy rests on the assumption that at least some chronic diseases—those unexplained by individuals’ socioeconomic characteristics and health behaviors—occur randomly. Using alternative approaches to identify health shocks, previous studies have demonstrated that sudden changes in health can induce older workers to reduce their labor supply or retire (Bound and others 1999; Riphahn 1999; Disney, Emmerson, and Wakefield 2006) and force younger individuals into inactivity (García-Gómez and López-Nicolás 2006; García-Gómez, Jones, and Rice 2010), and that the employment effects may persist over many years (García-Gómez and others 2013).

**Figure 2.8. Effect of Healthy Aging on Labor Market Outcomes**

(Regression coefficients)



Sources: Gateway to Global Aging Data; national microdata sources; and IMF staff calculations.

Note: The figure shows estimates from two-stage least squares regressions of labor market outcomes of individuals ages 50 and older on health indicators (one at a time, instrumented by chronic diseases), with individuals’ age, gender, education, wealth, and country fixed effects controlled for. Squares represent point estimates, whereas surrounding bars represent 90 percent confidence intervals. The coefficients are rescaled to reflect the estimated impact of “healthy aging” (health trends) over 10 years. PC = principal components; LFP = labor force participation.

six hours. In addition, better health is also associated with later retirement, working more weeks per year, and a lower probability of being unemployed, and qualitatively similar relationships hold for other health indicators (Online Annex Table 2.2.4).<sup>4</sup>

Although healthy-aging gains have been comparable across age groups, the labor market impact of a given improvement in health does vary with age. For instance, the impact of better health on labor force participation of individuals in their 50s is significantly larger than that for individuals in their 60s and 70s (Online Annex Figure 2.2.6). This suggests that even if the functional capacity of older individuals improves, other factors—such as skills obsolescence, pension incentives, and age discrimination—can still constrain their attachment to the labor market (Neumark, Burn, and Button 2019; D’Albis 2023). However, evidence

<sup>4</sup>Qualitatively similar results are obtained when using an augmented inverse-probability-weighting approach, in which chronic disease cases that are less predictable (that is, more random)—based on individuals’ socioeconomic characteristics and health behaviors—are given a higher weight, and when using the composite health measure of frailty that averages various measured and self-reported health indicators (Online Annex 2.2).

of a general rise in the “age-friendliness” of today’s jobs (Acemoglu, Mühlbach, and Scott 2022) provides something of a silver lining. Also, occupation-level data suggest that older workers with college educations are relatively well positioned to benefit from the productivity-boosting potential of AI because it complements their tasks and skills (Box 2.3).

Overall, these findings suggest that healthy aging can expand the effective labor supply of older individuals through higher labor force participation, employment probability, numbers of hours worked, and productivity. To assess how healthy aging can mitigate the economic effects of population aging, the next section incorporates these elements into a general equilibrium analysis.

## Economic Implications of Global Population Aging

The economic impact of demographic shifts is multifaceted. First, variations in fertility, mortality, and migration have an impact on both population growth rates and age structures. Given individuals’ typical life cycle—birth, schooling, working, and retirement—chronological age thresholds defining economic activity and retirement relative to life expectancy play a critical role. A rising share of the working-age population (those ages 15–64) boosts labor supply and economic growth, whereas an increasing old-age dependency ratio (number of individuals ages 65 and older relative to the number in the working-age population) weighs on growth and strains public finances on account of higher spending on pensions, health care, and long-term care. These pressures intensify as the lifespan beyond retirement age lengthens.<sup>5</sup>

Second, the expected length of working lives relative to retirement influences individuals’ saving behavior. If life expectancy increases while the effective retirement age remains unchanged, individuals tend to save more to smooth consumption over their lives, driving up aggregate savings. Moreover, if the within-economy age profiles of wealth and labor income are held fixed, an increasing share of older individuals raises total wealth.

<sup>5</sup>The subsequent analysis focuses on effective (rather than statutory) retirement age, which has significant macroeconomic implications. Among advanced economies, the median effective retirement age is about 2.5 years lower than the statutory retirement age. However, it varies widely across countries and over time, likely reflecting adjustments to the statutory retirement age, the generosity of pensions, and differences in health status among older workers.

At the same time, a shrinking workforce increases capital per worker, reducing investment needs. These forces combine and, on balance, tend to place downward pressure on interest rates (Gagnon, Johannsen, and López-Salido 2021; April 2023 *World Economic Outlook* [WEO], Chapter 2).<sup>6</sup> The uneven pace of these trends across economies due to aging will largely shape their net foreign asset positions (Auclert and others 2024). The general equilibrium effects of aging on both growth and interest rates will have important implications for public finances.

Third, beyond chronological age, physiological aging also influences individuals’ labor supply and retirement decisions. In line with findings in the previous section, research suggests that physiological functioning is a key predictor of individuals’ labor force participation and productivity, independent of their chronological age (Kotschy, Bloom, and Scott 2024). Improvements in how individuals age can thus affect education, work, and saving decisions, with broad implications for aggregate labor supply, interest rates, and economic growth.

Finally, asynchronous aging across countries creates opportunities for efficiency gains from cross-border reallocation of production factors. Capital may flow from old, high-savings economies to younger, capital-scarce economies, shaping external balances (Gourinchas and Rey 2014; Auclert and others 2024). Similarly, labor may gradually migrate from younger, labor-abundant economies to older economies facing labor scarcity.

## The Model

This chapter employs an extension of the global overlapping-generations model in Auclert and others (2024) to assess the general equilibrium implications of demographic forces for individual economies and globally (see Online Annex 2.3 for details).

- **Country coverage:** The model includes 21 advanced economies, 4 emerging market economies (including China and India, which together account for almost 50 percent of emerging market economies’ GDP), and a bloc economy comprising 44 low-income

<sup>6</sup>The focus of the chapter is on aging-induced pressures on interest rates due to changes in the age structure of economies and their impact on savings supply and investment demand. However, the future direction of interest rates is also shaped by other factors influencing investment demand, such as future productivity trends as well as public spending to tackle pressing policy issues such as climate change or national security.

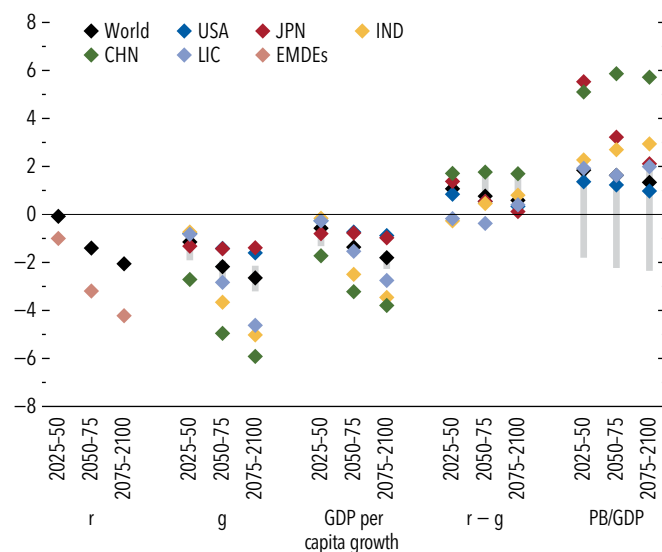
countries (LICs) expected to pass their demographic turning points after 2040 (denoted *LIC bloc* hereafter). Altogether, the model accounts for about two-thirds of the world economy and population.

- **Healthy aging:** The country-specific age-productivity profiles of workers vary over time to integrate the impact of healthy aging on effective labor supply (proxied by labor earnings, capturing effects on labor productivity and number of hours worked) documented in the previous section. Even if policies supporting healthy aging remain unchanged, the improvements observed over 2000–22 are likely to persist for some time as current young workers who benefited from those policies transition into old age. Accordingly, the baseline assumes a continued—though moderating—improvement in the functional capacity of workers ages 50 and older over the next three decades.
- **Productivity:** Apart from the effect of healthy aging on age-productivity profiles, aggregate productivity at the country level is driven in the model by three forces, which are calibrated based on empirical evidence: the growth of total factor productivity (TFP) at the global frontier, convergence toward the TFP frontier, and the impact of demographics on TFP growth through innovation and entrepreneurship channels.
- **Global capital market:** The model assumes that the integration of China, India, and the *LIC bloc* into global capital markets is imperfect. This results in a wedge between domestic and global interest rates for these economies that is assumed to decline gradually as they undertake credit and capital market reforms, continue strengthening governance and institutions, and become increasingly integrated in global financial markets.<sup>7</sup>
- **Fiscal policy:** Initial values for effective retirement rates, labor taxes, retirement replacement rates, and other public spending are calibrated to match country-specific targets in the data. In the baseline, effective retirement ages are assumed to increase by one month per year over 60 years in all countries (except for India and the *LIC bloc*, where they are

<sup>7</sup>In the literature, the wedge in the interest rate that emerging market and developing economies face can be attributed to factors such as a higher growth rate of the labor force (Carvalho and others 2023), a lower degree of financial integration (Bielecki, Brzoza-Brzezina, and Kolasa 2020), and market segmentation (Pellegrino, Spolaore, and Wacziarg 2024).

**Figure 2.9. Baseline Projections: Growth, Interest Rates, and Primary Balances**

(Deviation from 2016–18 average, percentage points)



Source: IMF staff calculations.

Note: Diamonds mark the annual average over the reported periods. Grey bars denote interquartile ranges. A positive value for PB/GDP indicates a country would need a higher primary balance in the reported period than it had, on average, in 2016–18 to keep its debt ratio stable beyond 2029. The values for “World” denote averages for the economies included in the model while the values for “EMDEs” denote averages for China, India, and the LIC bloc. Data labels in the figure use International Organization for Standardization (ISO) country codes. EMDEs = emerging market and developing economies; g = GDP growth rate; LIC = bloc of low-income countries; PB = primary balance; r = interest rate.

assumed unchanged). Labor taxes, replacement rates, and other public spending adjust period by period so that trajectories of debt-to-GDP ratios are aligned with WEO projections until 2029 and remain stable from then onward.

### Implications of Aging under Current Policies

Under current policies, global growth is expected to decline as population aging accelerates, but the severity of the expected growth decline varies widely across countries (Figure 2.9). Global average annual growth over 2025–50 is projected to be about 1.1 percentage points lower than the average over 2016–18, and 2 percentage points lower when the average over 2025–2100 is considered. Advanced economies with relatively older populations (such as Japan) will see their economies shrink. Other advanced economies that are projected to avoid a decline in

their working-age populations under baseline fertility and migration assumptions (such as Canada and the United States) will continue to grow, albeit more slowly over time.

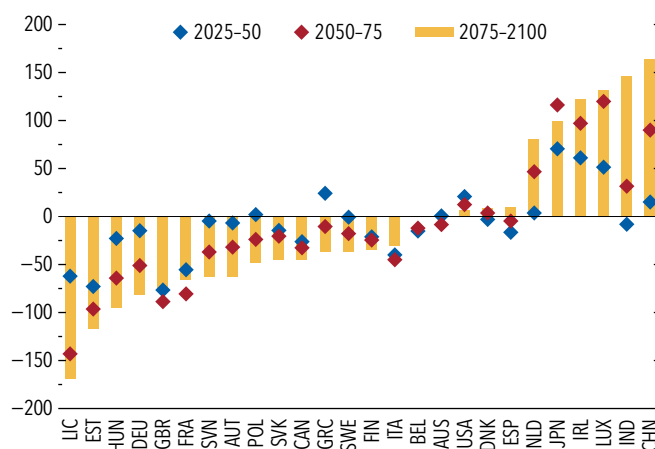
In the group of emerging market and developing economies, China will witness a particularly sharp decline in its GDP growth over 2025–50—a deceleration of 2.7 percentage points relative to the 2016–18 average—reflecting acutely adverse demographics, as well as the approaching end of the era of rapid catch-up to frontier productivity. India, with its relatively favorable near-term demographics, is projected to experience a smaller growth decline in 2025–50 (of about 0.7 percentage point), but the decline will intensify over 2050–2100 as the country passes its demographic turning point. Low-income countries are also expected to see a sharper deceleration in growth in the second half of the century, once demographic dividends turn into headwinds.

The projected slowdown is generally smaller in regard to output per capita, but most economies will see a deceleration going forward. For the world average, and relative to 2016–18, output per capita growth will be about 0.6 percentage point lower in 2025–50 and 1.8 percentage points lower toward the end of the century.

Lower expected growth, combined with an increasing share of older populations, would reduce the need for additional investments and push up desired aggregate savings, resulting in downward pressure on interest rates.<sup>8</sup> However, the interest-growth differential ( $r - g$ ) projected for the next 25 years is higher than the 2016–18 average for all economies except India and the *LIC bloc*—meaning that, all else equal, a higher primary balance would be needed to keep debt ratios stable. Average  $r - g$  for the world is projected to be 1 percentage point higher in 2025–50 than in 2016–18, moderating to about 0.5 percentage point toward the end of the century as population aging increases global savings relative to investment demand everywhere. Early- (late-)aging countries will see  $r - g$  pressures easing (increasing) toward the end of the

<sup>8</sup>It is conceivable that investment rates may not fall by much if aging-induced labor scarcity fosters investment in labor-saving technologies (Goodhart and Pradhan 2020). If automation or AI adoption responds endogenously to an aging population, interest rates could face upward pressure, either from sufficiently large productivity gains (Stähler 2021) or an increase in the capital share in output (Moll, Rachel, and Restrepo 2022). These channels are not accounted for in the model.

**Figure 2.10. Baseline Projections: Net Foreign Assets**  
(Deviation from 2016–18 average, percent of GDP)



Source: IMF staff calculations.

Note: The bars and diamonds denote annual averages over the reported periods. Data labels in the figure use International Organization for Standardization (ISO) country codes. LIC = bloc of low-income countries.

century as aggregate savings and wealth evolve along with the transition.

To keep debt-to-GDP ratios stable from 2030 onward, about half of the model economies are projected to need higher primary-balance-to-GDP ratios than they had on average over 2016–18. Importantly, this group includes the largest economies, such as China, Japan, and the United States. The larger required fiscal effort reflects the combination of adverse demographics and the large increase in public debt many countries have experienced since the onset of the pandemic.<sup>9</sup>

The uneven demographic trends would influence the direction of future capital flows and contribute to divergent net foreign asset positions across the world over the long run. Large emerging market economies (China and India) would accumulate foreign assets, especially over 2050–2100, whereas many advanced economies would gradually draw down foreign assets throughout the projection horizon (Figure 2.10). The net foreign asset position for the *LIC bloc* would

<sup>9</sup>The model accounts for the implications of aging for pension spending but does not include other age-related health care and long-term care spending. The European Commission Directorate-General for Economic and Financial Affairs (2024) estimates these nonpension expenditures could increase by 1.2 percentage points of GDP on average across member states, whereas education spending would decline by 0.5 percentage point of GDP as a result of aging; the spending impact would, however, be highly heterogeneous across countries.

worsen through most of the projection period, as low-income economies with younger populations in this bloc benefit from continued capital inflows. However, this trend would slow and eventually reverse around 2070 as these countries' aggregate wealth starts to increase with population aging.

### Growth Dividends from Healthy Aging

To what extent does healthy aging help to avert an even steeper slowdown in GDP growth under current policies? Results from counterfactual simulations indicate that the contribution to growth from recent healthy-aging improvements will be sizable over 2025–50. For the world, healthy aging is projected to add about 0.4 percentage point to GDP growth, on average, over 2025–50 (Figure 2.11, panel 1). That is, if expected gains from healthy-aging trends were abstracted from, global output growth would be projected to slow by 1.5 percentage points—as opposed to 1.1 percentage points—in 2025–50 when compared with average growth in 2016–18.

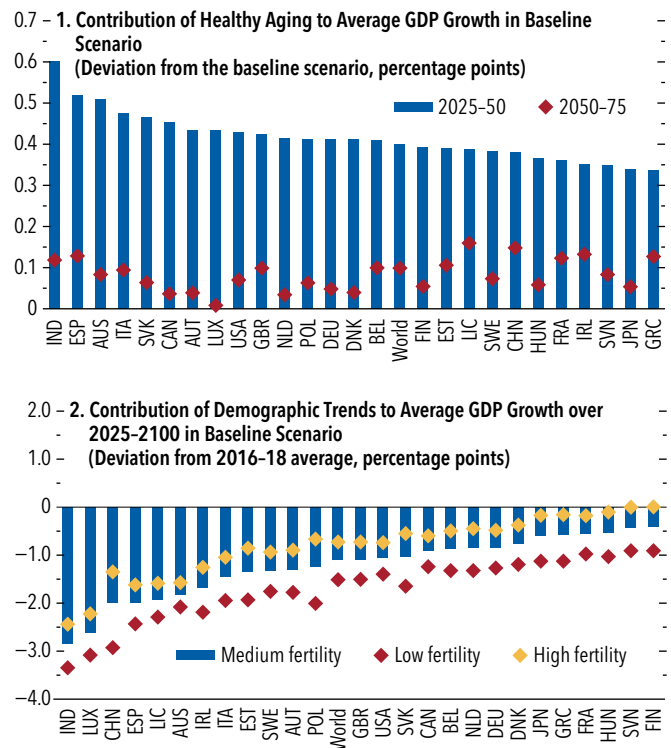
The projected contributions of healthy-aging gains to average annual output growth are positive and sizable for all individual economies in the model, ranging from about 0.3 percentage point to 0.6 percentage point. The contribution is particularly large for India, for instance, as its share of workers ages 50 and older is projected to grow fast in that period, whereas it is relatively lower in Japan, as its share of older workers, though high, will grow at a slower pace over 2025–50.

Under current policies, the contribution to growth from healthy aging would gradually fade as current cohorts of workers transition through their late adult stage and into retirement. The average contribution to world growth would be about 0.1 percentage point over 2050–75 and would decline further thereafter.

### Impact of Demographic Assumptions

The model simulations take as given United Nations World Population Prospects (UNWPP) assumptions regarding the future path of fertility and mortality rates in individual countries. These demographic assumptions are an important driver of the projected growth slowdown under the baseline: They account for about half of the slowdown in projected GDP growth over 2025–2100 relative to the average in 2016–18. More precisely, demographic forces alone—that is, abstracting from the other forces considered in the baseline, such as cross-country convergence in pro-

**Figure 2.11. The Role of Healthy Aging and Demographic Trends**



Source: IMF staff calculations.

Note: The bars and diamonds denote annual averages over the reported periods. The values for “World” denote averages for the economies included in the model. Data labels in the figure use International Organization for Standardization (ISO) country codes. LIC = bloc of low-income countries.

ductivity and the impact of healthy aging—explain 1.1 percentage points out of a reduction of 2 percentage points in global GDP growth (Figure 2.11, panel 2). Among countries in the model, the average contribution of demographic forces to GDP growth in 2025–2100 ranges from close to –2.8 percentage points in India to –0.4 percentage point in Finland and Slovenia.

Demographic projections are of course subject to uncertainty. For instance, whereas the UNWPP “medium” fertility projections used for the baseline assume birth rates will eventually rebound in many countries, fertility projections have been systematically revised downward in recent years (see Online Annex Table 2.3.1). On the other hand, authorities in more than 50 countries, especially in Asia and Europe, where the pace of aging has raised alarms, have adopted policies to foster higher birth rates (United Nations Department of Economic and Social Affairs 2021).

To assess the sensitivity of projections to fertility assumptions, the model is simulated using alternative UNWPP projections based on fertility rates higher and lower than those in the medium-fertility scenario.<sup>10</sup> Indeed, the expected contribution from demographics to GDP growth in 2025–2100 varies widely with the fertility assumptions, with the country-specific growth estimates under alternative fertility assumptions varying, for instance, by 0.5 percentage point in Australia and 1.6 percentage points in China. However, the contribution of demographics to GDP growth is mostly negative under different fertility assumptions.

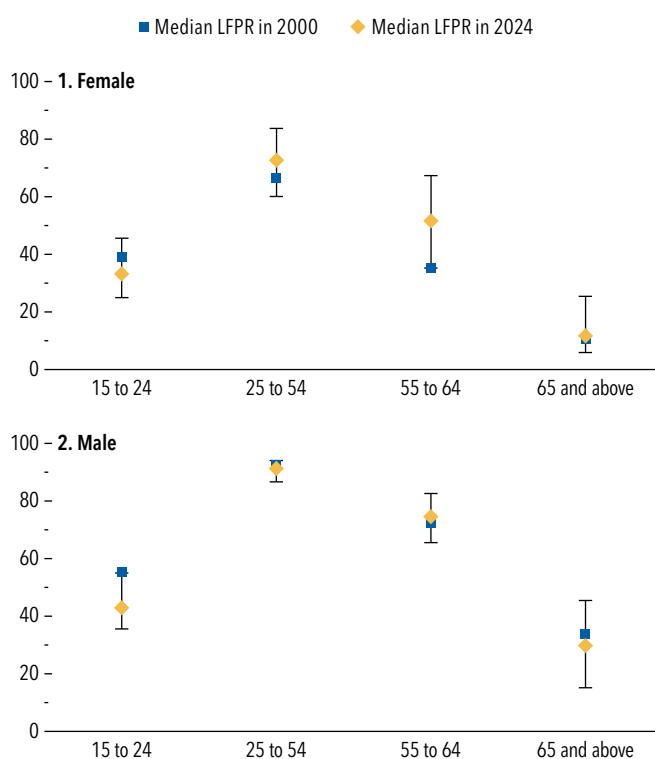
### Growth Tailwinds from Labor Supply Policies

How can policies mitigate the adverse economic impacts of population aging? There are three key policy levers that could provide growth tailwinds amid population aging: tackling the decline in participation rates of older individuals, extending working lives as life expectancy rises, and narrowing gender participation gaps (Figure 2.12). A set of alternative scenarios is used to assess the general equilibrium impact of addressing these issues (see details in Online Annex 2.3):

*Healthy-aging policies:* Targeted health policies and other initiatives can enable older workers to increase their labor force participation rates. Indeed, the significant increase in the global median participation rate between 2000 and 2024 in the 55–64 age group is encouraging, but there is significant room for further narrowing the participation gap with respect to prime-age workers. A first model scenario assumes the rollout of policies in areas such as health promotion and prevention that lead to a gradual narrowing of cross-country differences in the functional capacity of workers ages 50 and older. Under such a scenario, the additional long-term improvement in the functional capacity of older individuals would reduce current cross-country gaps by one-fourth and, on average, would be equivalent to about 49 percent of the estimated gains over 2000–22. The results indicate notable growth dividends because of higher labor force participation rates for older individuals who have not yet reached retirement age, as well as higher productivity relative to the baseline (Figure 2.13). For the world, average annual GDP growth over 2025–2100 would be about 0.2 percentage

<sup>10</sup>Under the UNWPP’s high- (low-)fertility scenario, fertility is projected to remain 0.5 children above (below) the fertility rate in the medium-fertility scenario over most of the projection period.

**Figure 2.12. Labor Force Participation by Age Group (Percent)**



Sources: International Labour Organization; United Nations World Population Prospects; and IMF staff calculations.

Note: The whiskers indicate 2024 interquartile ranges across countries. LFPR = labor force participation rate.

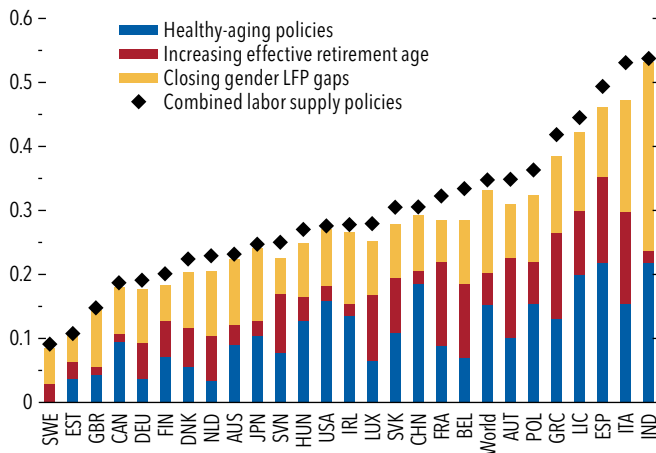
point higher than in the baseline—and 0.3 percentage point higher over 2025–50.<sup>11</sup>

*Higher effective retirement age:* There is also scope for increasing labor force participation among both men and women in the 65-and-older age group, by postponing the effective retirement age given healthy-aging improvements. This is not necessarily or exclusively related to raising statutory retirement ages. Healthy aging may encourage older workers to voluntarily delay their retirement even if statutory retirement ages are unchanged, depending on the incentives of pension plans.<sup>12</sup> A second scenario assumes that policy changes

<sup>11</sup>The scenario assumes all countries in the model implement policy changes, but their magnitude and pace depend on initial conditions. Countries at or close to the health frontier, which do not see any additional improvement in the functional capacity of older workers relative to the baseline, would not register growth dividends.

<sup>12</sup>At the same time, raising the statutory retirement age may not yield the desired impact on effective retirement age if older workers are not physically or cognitively able to remain active or if their productivity declines rapidly with age (Kotschy, Bloom, and Scott 2024).

**Figure 2.13. Average Impact of Labor Supply Policies on GDP Growth over 2025–2100**  
*(Deviation from the baseline scenario, percentage points)*



Source: IMF staff calculations.

Note: The bars (markers) represent the deviations from the baseline scenario when each labor policy is implemented in isolation (all labor policies are implemented together). The sum of the values for the individual policies does not necessarily coincide with the value for the combined policy scenario because of interactions between the policies. The value for “World” denotes the average for the economies included in the model. Data labels in the figure use International Organization for Standardization (ISO) country codes. LFP = labor force participation; LIC = bloc of low-income countries.

lead effective retirement ages to increase at a faster pace than under the baseline in countries where life expectancy at retirement is 20 years or more—in line with prospective old-age thresholds (Sanderson and Scherbov 2010; Kotschy and Bloom 2023)—while otherwise evolving as in the baseline. In such a scenario, average annual GDP growth over 2025–2100 for the world would be about 0.1 percentage point higher than in the baseline. The growth dividends would be higher in European economies, in which the gap between effective retirement ages and life expectancy is large and would increase further under unchanged policies.

**Closing labor force participation gaps:** Finally, average labor force participation rates remain higher for men across most countries, providing scope for closing gender gaps in labor force participation. A third scenario assumes that policies lead to narrowing country-specific gender gaps in labor force participation by three-fourths by 2040. Under this scenario, average annual GDP growth for the world economy would be 0.1 percentage point per year higher than in the baseline over 2025–2100—and the difference would be even larger, at 0.3 percentage point, over 2025–50—with a particularly large boost in India given its current large gender gaps.

**Combined policy package:** Combining the three labor supply policy layers would yield sizable growth gains and partly mitigate the projected growth decline in the baseline. For the global economy, average annual growth would be 0.3 percentage point higher over 2025–2100 than in the baseline scenario, reversing about one-third of the drop in growth attributable to demographic trends through the end of the century. The boost to global growth would be even larger, at about 0.6 percentage point, over 2025–50 (Online Annex Figure 2.3.4), offsetting close to three-fourths of the drag from demographics during that period. Some countries—notably India, low-income countries, and some European economies—could reap even higher growth dividends. Equally meaningfully, keeping older workers engaged in economic activities may offer non-monetizable societal benefits from improved well-being for a large portion of future societies (Scott 2023).

**Fiscal Implications**

How much could labor supply policies ease fiscal pressures? These policies would first have direct implications for the primary balance of the public sector—including but not limited to their impacts through pension system balances. For instance, increasing female labor force participation and employment could boost labor tax revenues. Similarly, policies that raise the effective retirement age would increase labor taxes and reduce transfer payments.

Second, labor supply policies would also have an impact on public finances through their effect on  $r - g$ . Higher GDP growth would contribute to reducing  $r - g$  and easing fiscal pressures—meaning that, all else equal, a lower primary balance would keep the debt ratio stable. However, labor supply policies could also put upward pressure on interest rates because of lower desired aggregate savings—due, for instance, to longer expected working lives—and increased investment demand to accommodate a larger labor force.<sup>13</sup> The overall effect on  $r - g$  would depend on how much these reforms boost growth in individual countries and

<sup>13</sup>It is also important to acknowledge that government borrowing costs may deviate from equilibrium interest rates considered in the model as a result of factors related to the depth of markets for sovereign debt, the international currency status of the country issuing the debt, and increased debt issuance, as well as shifts in safe asset demand or market sentiment regarding fiscal risks. Limited market capacity to absorb large debt issuances may also put upward pressure on government borrowing costs and cause gradual erosion in the “convenience yield” on government debt; see, for example, the discussion in Mian, Straub, and Sufi (2022) and the April 2023 WEO, Chapter 2.

on the sensitivity of global interest rates to improved growth prospects. Model simulations indicate that five model economies (Greece, India, Italy, Spain, and the LIC bloc) would see some fiscal respite from lower  $r - g$  over 2025–50, reinforcing the direct benefits of labor policies on primary balances.<sup>14</sup>

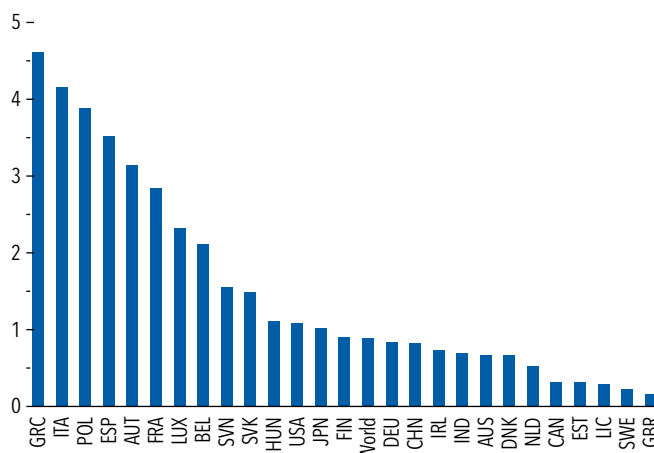
Altogether, when the effect of labor supply policies on primary balances and on  $r - g$  is considered, all model economies would gain fiscal space under the combined policy scenario. That is, they could afford to increase spending on critical areas, such as climate-related initiatives reduce labor income taxes, or expand transfers, while maintaining public debt targets. The extent of additional fiscal space would nonetheless be quite heterogeneous across countries. Assuming the fiscal dividends from progrowth policies are employed in equal proportions to reduce taxes, increase transfers, and increase other spending, the gains would be equivalent, on average, to more than 4 percentage points of GDP in Greece and Italy, but less than 1 percent of GDP in China and the United Kingdom (Figure 2.14). An additional exercise shows that the fiscal dividends from progrowth policies would allow many countries—though not all—to gain fiscal space while at the same time rebuilding buffers by reducing public debt to its average level in 2016–18 (Online Annex Figure 2.3.5). The differences in potential fiscal dividends across countries reflect variations in the direct effect of labor supply policies on primary balances as well as the interaction of higher interest rates with different initial levels of debt.

One caveat to these findings is that implementing some of the policies considered here could entail direct budgetary costs, which could lead to somewhat smaller net fiscal dividends than implied by the model simulations. Implementing active labor market policies, for instance, can entail costs (for example, Banerji and others 2017). However, these policies also tend to benefit older workers the most (April 2024 WEO, Online Annex 3.2). Additionally, policies to foster healthier aging are not necessarily fiscally costly. For instance, taxes on alcohol and tobacco can generate fiscal revenue, and preventive health policies can lead

<sup>14</sup>The sensitivity of global interest rates to labor supply policies is partly related to households' saving response to changes in growth prospects, which is difficult to pin down with precision. Assuming a different calibration for households' willingness to substitute future consumption for present consumption, the effect of progrowth reforms on interest rates would be smaller, and  $r - g$  would decline for almost all economies over 2025–50 (Online Annex 2.3).

**Figure 2.14. Additional Fiscal Space in Combined Policy Scenario**

(Deviation from the baseline scenario, percentage points of GDP)



Source: IMF staff calculations.

Note: The figure shows the fiscal gains under the combined policy scenario due to higher effective labor supply and improved old-age dependency ratio relative to the baseline; see Online Annex 2.3.3 for further details. Because the magnitude of the gains varies over the transition, the figure reports the average gain over 2025–2100. The value for “World” denotes the average for the economies included in the model. Data labels in the figure use International Organization for Standardization (ISO) country codes. LIC = bloc of low-income countries.

to future saving on health care spending (McDaid, Sassi, and Merkur 2015). Because quantifying the overall net fiscal cost from implementing the labor supply policies considered in the chapter is subject to large uncertainty, the model abstracts from these costs.

## Conclusions and Policy Implications

Declining birth rates and increasing life expectancy are leading to a sustained decline in population growth and significant changes in the age structure of economies. As the share of the working-age population starts to decline in more and more countries, and the workforce becomes tilted toward older ages characterized by lower labor force participation and employment rates, demographic forces seem to be casting long shadows over prospects for living standards and public finances.

However, there is a silver lining to the rise of the silver economy. The analysis in this chapter highlights that individuals across a diverse set of economies are aging in better health than previously. Increased longevity has been accompanied by improvements in the physical and cognitive capacities of older individuals across subsequent cohorts—although there are still

sizable disparities across socioeconomic groups and countries. Importantly, this healthier-aging trend has also been associated with higher labor force participation rates, a higher likelihood of being employed, and higher labor earnings for individuals ages 50 and older.

Nevertheless, population aging, together with other forces such as waning catch-up growth in large emerging market economies, is expected to depress global economic growth. Even as ongoing gains from healthy aging are estimated to boost annual global growth by about 0.4 percentage point over 2025–50, the analysis in this chapter indicates that under current policies global output growth would decline on average by about 2 percentage points through the end of the century. With lower growth prospects and historically high levels of public debt, many countries will need significant fiscal efforts to keep debt-to-GDP ratios stable beyond 2030.

A multifaceted policy approach is essential to deal with these challenges. Broad-based improvement in the functional capacity of individuals ages 50 and older over the past few decades shows that aging can be a malleable process (Scott 2023). Policies aimed at improving the human capital of older workers can enhance productivity and narrow the participation gap with prime-age workers. Emphasizing health promotion and prevention policies is warranted, and these policies need to be carefully deployed to address health inequalities. Measures that tackle behavioral risk factors throughout the course of life—such as tobacco smoking, harmful alcohol use, physical inactivity, and unhealthy diets—and other risk factors related to the environment and mental health can decrease the incidence of chronic diseases and health inequalities (Liu and others 2016; Rashbrook 2019; Lee, Park, and Lee 2020; Hacker 2024). Examples include immunization, regular health checks, screenings for chronic diseases, campaigns to prevent substance abuse, taxation (for example, on tobacco and unhealthy food), regulations (for example, those to promote smoke-free environments), and providing access to mental health resources. These measures often span beyond the health care sector and are not necessarily costly. Evidence suggests many are cost-effective and can produce savings by reducing expenditure on health intervention down the road (McDaid, Sassi, and Merkur 2015; OECD 2015). Yet spending on health promotion and prevention accounts for only 1–6 percent of total health expenditure in member countries of the Organisation for Economic Co-operation and Development

and tends to be cut disproportionately during downturns (Gmeinder, Morgan, and Mueller 2017; Hacker 2024).

A comprehensive approach, combining pension reforms, training, and workplace adaptations, should complement health-oriented interventions to increase effective retirement ages in line with improvements in life expectancy. Besides changes to statutory retirement ages, reducing early retirement benefits, introducing incentives to postpone retirement, and allowing for phased retirement can induce a rise in effective retirement age. Pension system reforms need to balance sustainability with adequate protection to mitigate old-age poverty and inequality (Amaglobeli and others 2019). More broadly, the malleability of aging and the diversity in health status and experience among older workers suggest that age-based provisions in policies are likely to be inefficient and should be reconsidered (see discussion in Scott 2023). Also, lifelong upskilling and reskilling programs are crucial to ensure individuals remain employable as they age. This becomes even more important at the cusp of a potential AI revolution, in which skilled older workers will be well positioned to reap the benefits given the complementarity of their skills with AI, whereas unskilled workers may struggle to keep their jobs or manage successful job transitions (Box 2.3). Enhancing adaptability through flexible work arrangements and workplace adjustments that improve the age-friendliness of jobs can also support longer working lives. Combating biases and discrimination against older individuals is also important, as the former can limit access to reskilling opportunities and lead to premature exits from the labor force (Gaillard and Desmette 2010; Lamont, Swift, and Abrams 2015; Officer and others 2020; Alcover and others 2021).

Policies aimed at reducing labor force participation gaps, particularly by fostering higher female labor force participation, can also provide substantial growth dividends to counter demographic headwinds. To avert an adverse impact on fertility, policies should aim for improving the work-life balance for women, including improved parental leave systems, expanding on affordable childcare options, and promoting flexible work arrangements (Gu and others 2024).

Furthermore, enhanced global integration can play a crucial role in supporting growth amid aging trends occurring at different paces and timings across countries. In particular, policies that enhance access to international financial markets—including credit

and capital market reforms, as well as those strengthening governance and institutions (Budina and others 2023)—are key for enabling low-income countries to reap the benefits of still-positive demographic dividends (Box 2.1). Gains from deeper financial integration can also offset the labor losses from migration outflows toward advanced economies, in which the additional workers can boost labor supply and output amidst an aging and dwindling workforce (see Chapter 3).

The simulations in this chapter suggest that a combination of policies for boosting labor supply could attenuate the slowdown in global growth over 2025–50 resulting from demographic headwinds by almost three-fourths. Although these progrowth policies could also contribute to higher global interest rates, they would nonetheless provide substantial fiscal dividends. Many countries would be able to rebuild fiscal buffers and create additional fiscal space to finance critical spending. Some economies, however, would still require additional fiscal efforts given the current precarious state of their public finances. In those cases, an early, gradual, and sustained effort is crucial to ensuring intergenerational fairness (Box 2.2) and maintaining economic stability amid ongoing demographic transitions.

Although policies to boost labor supply and facilitate cross-country factor mobility are key, they are not a substitute for efforts to reignite technological innovation and productivity growth—the ultimate driver of improvements in living standards. Structural reforms to promote market competition, financial accessibility, and labor market flexibility can boost productivity growth by fostering innovation, facilitating

a more efficient allocation of capital and labor across firms (see Budina and others 2023; April 2024 WEO, Chapter 3). They can also help countries benefit from technological advances such as AI-related technologies, which are complementary to labor in occupations more typical of older workers (Box 2.3) and can provide the latter with skills and methods for coping with functional decline due to aging (Abril-Jimenez and others 2022).

Technological progress and innovation can be important not only for countering the adverse effects of population aging on output growth, but also for enhancing the malleability of aging itself. Promoting research and development in the scientific understanding of biological aging has the potential to further extend healthy longevity in the decades ahead (Cox 2022). Furthermore, AI-based solutions in health care hold potential for transformation through scaling up of preventive health practices (Chan and others 2024), for instance by automating routine tasks such as screening and diagnostics. They can also bring clinical expertise to underserved and remote areas, helping to reduce the heterogeneity in physical and cognitive capabilities of older individuals documented in this chapter. For example, the Aravind Eye Care System in India has deployed AI-based tools to screen millions of retinal images for diabetic retinopathy, effectively addressing the country's shortage of ophthalmologists and preventing vision loss among patients (Yu, Beam, and Kohane 2018).

Ultimately, the rise of the silver economy brings both challenges and opportunities, making a comprehensive and proactive policy approach essential for navigating the challenges of population aging while harnessing the benefits of longer, healthier lives.

### Box 2.1. Enhancing Global Financial Integration to Support Growth in Low-Income Countries

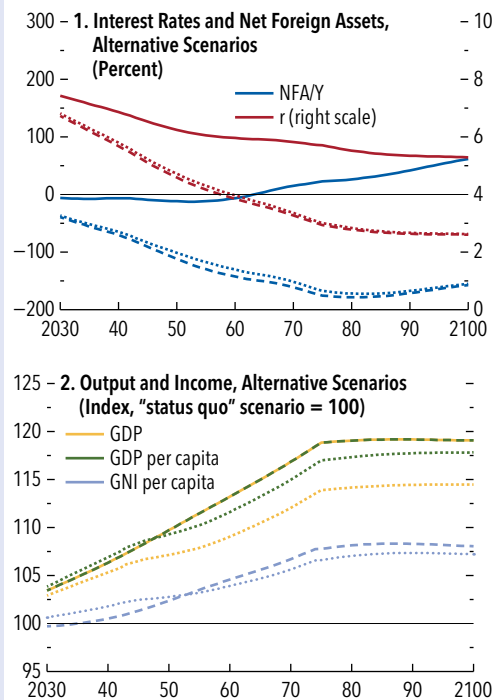
Could capital flows from advanced to capital-scarce, low-income countries help the latter grow faster and capitalize on their demographic tailwinds? Would gains from enhanced financial integration offset losses from potentially larger migration outflows toward older, rich countries? To answer these questions, this box uses the model presented in the chapter and focuses on alternative scenarios for cross-border capital and labor flows in the low-income country group (*LIC bloc*).

Firms in emerging market and developing economies face generally higher costs of capital than firms in advanced economies when accessing global financial markets. This wedge or premium may reflect credit market imperfections, expropriation risks, bureaucratic inefficiencies, corruption, or any combination of these factors (Gourinchas and Jeanne 2013). To assess potential gains from financial integration, a first, *status quo* scenario assumes that after the *LIC bloc* starts from a zero net foreign asset position, capital can flow from and toward it, but the initial wedge between domestic and global interest rates, which is set to 300 basis points in line with estimates in Gerding, Henriksen, and Simonovska (2025), remains unchanged throughout the simulation period. A second, *enhanced financial integration* scenario assumes instead that *LIC bloc* countries undertake credit and capital reforms, improve their governance frameworks, and strengthen their institutions such that the interest rate wedge gradually declines until disappearing by 2070—assumptions similar to those for the baseline projections in the chapter.

In the *status quo* scenario, the *LIC bloc* does import capital from the rest of the world, but flows are limited. Net foreign liabilities peak at about 13 percent of GDP (Figure 2.1.1, panel 1). From about 2050 onward, capital flows reverse as demographic shifts in the *LIC bloc* push desired savings upward. In the *enhanced financial integration* scenario, demand for investment increases as the interest rate that domestic agents face falls at a faster pace, leading to larger capital inflows and net foreign liabilities reaching about 180 percent of GDP by 2070–80. After that, as aging accelerates in low-income countries, their net foreign asset positions stabilize and then start to gradually reverse toward the end of the century. The capital

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**Figure 2.1.1. Low-Income Countries: Impact from Enhanced Financial Integration and Migration Outflows**



Source: IMF staff calculations.

Note: In panel 1, solid lines denote "status quo" scenario. In both panels, dashed lines denote "enhanced financial integration" scenario and dotted lines denote "enhanced financial integration plus migration" scenario. GNI = gross national income; NFA/Y = net-foreign-assets-to-GDP ratio; r = interest rate.

stock and output are significantly higher than in the *status quo* scenario, with the gap widening until the 2070s. Because the population dynamics are the same across the two scenarios, both GDP and GDP per capita are about 19 percentage points higher than in the *status quo* scenario in the long term (Figure 2.1.1, panel 2). As a result of the fact that the dividends from part of the additional investment financed with capital inflows accrue to nonresidents, the long-run increase in gross national income per capita is smaller than that for GDP, but it is still sizable at about 7 percentage points.

Given the asynchronous pace of aging across countries, labor would tend to gradually migrate from

**Box 2.1 (continued)**

young, labor-abundant economies to older economies facing labor scarcity, attracted by higher wages and better employment prospects. A key question is whether the benefits from financial integration can offset headwinds low-income countries may face from potentially larger migration outflows. A third, *enhanced financial integration plus migration* scenario adds to the previous one by assuming also that the annual flow of young migrants from the *LIC bloc* into advanced economies gradually increases up to 2040 such that, from then onward, the annual outflows of young migrants are twice as large as recent historical flows and remain at that higher level thereafter.<sup>1</sup> As the labor force in the *LIC bloc* shrinks over time relative to what occurs in the previous scenario, capital accumulation slows down because of lower investment demand, and, consequently, capital inflows are somewhat smaller. In the long term, with a smaller

<sup>1</sup>The model scenario assumes that the additional migrants, beyond what is assumed in United Nations World Population Prospects projections, are concentrated among individuals ages 20–24. This is a simplifying assumption that allows to abstract from the net wealth of the additional migrants as the 20-year-old cohort in the model is assumed to have zero net wealth.

workforce and less capital, aggregate GDP in the *LIC bloc* would be about 5 percentage points lower relative to that in the *enhanced financial integration* scenario, but still 14.5 percentage points higher than in the *status quo* scenario.

Since the additional migration flows are assumed to be among young individuals, who have lower labor force participation rates and productivity than prime-age workers, GDP per capita in the *LIC bloc* in the *enhanced financial integration plus migration* scenario initially increases by more than it does without additional migration flows. Over time, however, GDP per capita becomes lower than in the *enhanced financial integration* scenario because the workforce is smaller. In the long term, GDP per capita in the *LIC bloc* is about 1.2 percentage points lower than in the *enhanced financial integration* scenario but almost 18 percent higher than in the *status quo* scenario.

Overall, the results illustrate the importance of financial sector reforms and efforts to strengthen governance and institutions in enabling low-income countries to reap their demographic dividends before the window for doing so closes and to offset potential output losses from migration outflows to older economies.

## Box 2.2. Intergenerational Considerations in Pension Reforms

Because the share of individuals ages 65 and older is projected to increase steadily worldwide, relatively fewer workers will be supporting more retirees, stressing pay-as-you-go pension plans and public finances. Policymakers can employ different levers to adjust pension plans so that they remain solvent, such as increasing statutory retirement ages, increasing contributions from workers or firms, and reducing benefits to pensioners. Policymakers often opt to postpone unavoidable reforms, because the financial pressures from aging accrue slowly. The choice of instruments and their timing, however, can entail uneven reform costs across cohorts and larger costs overall.

This box uses the Overlapping Generations and Retirement model (Baksa and Munkacsi 2016) to simulate the impact of pension reforms in a typical advanced economy. This is a dynamic general equilibrium model with demographics, overlapping generations, unemployment, and a rich fiscal sector.<sup>1</sup> Population changes over time, with the changes driven by shocks to fertility and mortality. The model tracks the macroeconomic and fiscal implications of aging and fiscal policy separately for two generations: the young, who work (or are unemployed) and pay consumption and labor income taxes (or receive unemployment benefits), and the old, who are retired and receive pension benefits. Population aging causes the labor force to shrink (in relative or absolute terms), which, in turn, drags down the growth rates of consumption, investment, and output.<sup>2</sup> Aggregate consumption and savings are also affected by the fact that workers and retirees have different consumption

and saving patterns. The prospect of living longer can also trigger precautionary saving. Shrinking labor supply can contribute to higher capital-to-labor ratios, reducing the need for further investment, which puts downward pressure on interest rates. Meanwhile, aging carries several fiscal challenges: Pension (and health) spending can climb when the number of retirees rises, whereas a shrinking labor force might imply lower consumption and labor income tax revenues. As a result, aging can push the public-debt-to-GDP ratio upward.

The analysis considers three instruments for reforming pension plans. In regard to direct effects, higher social security contributions affect the disposable income of young workers, a reduction in the wage replacement rate of pensions means lower benefits for pensioners, and raising the statutory retirement age implies a reduction in the number of retirees relative to the number of workers. Policy changes employing these instruments could also trigger indirect effects through behavioral responses. The analysis considers the impact of each reform separately and when implemented jointly as a package, as well as with immediate implementation versus that with a 10-year delay. Each reform scenario is calibrated such that the aging-induced increase in the public-debt-to-GDP ratio is reversed in 75 years (Table 2.2.1).

Simulations based on the model indicate that aging would depress per capita consumption for both the young and the old (with a larger decline in the case of the older populations) in the absence of reforms (red bars in Figure 2.2.1), because an increasing level of public debt would need to be serviced. However, the simulations also indicate that consumption losses can be attenuated and shared more equitably across generations if a reform that uses a mix of instruments is implemented, and if reforms start earlier rather than later:

- If reforms rely on a single instrument, sizable measures are needed. For instance, if only the retirement age is adjusted, an increase of six years would

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<sup>1</sup>Stylized data on demographics, labor markets, GDP and its components, and the fiscal sector are considered to capture the long-term characteristics of the artificial economy.

<sup>2</sup>The precise impact is determined by which factor or factors dominate (lower fertility, higher life expectancy, migration, other factors, or a combination of these), as outlined in Baksa, Munkacsi, and Nerlich (2020).

**Table 2.2.1. Size of Reforms Needed to Stabilize Age-Induced Increase in Public Debt**

	Retirement Age (Years)		Replacement Rate (%)		Contribution Rate (%)	
	Immediate	Delayed	Immediate	Delayed	Immediate	Delayed
Single-Instrument Reform	+6	+8	-25	-35	+18	+34
Mix	+2	+2.7	-8.3	-11.7	+6	+11.3

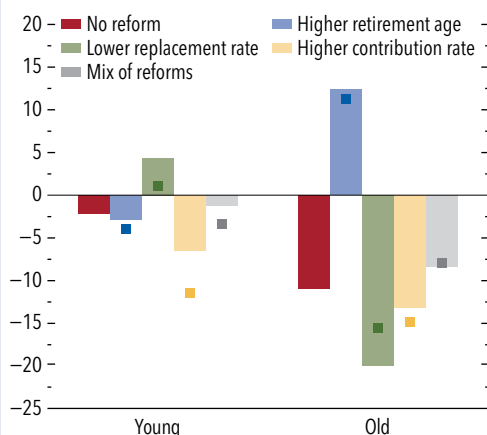
Source: IMF staff calculations.

Note: The reform scenarios are calibrated to reverse the aging-induced increase in the public-debt-to-GDP ratio over 75 years. The reforms are assumed either to be implemented immediately or to be delayed by 10 years.

**Box 2.2 (continued)**

**Figure 2.2.1. Average Change in Consumption, 2025-65**

(Deviation from 2025, percentage points)



Source: IMF staff calculations.

Note: Solid bars denote average consumption losses or gains over a period of 40 years from a reform implemented immediately. Markers denote consumption losses or gains if instead the reform is delayed by 10 years. The red bars show the impact of aging only, and the rest of the bars show the impact of aging and the respective reforms.

be needed if the reform is implemented immediately (Table 2.2.1). However, under a combined reform scenario, the increase in retirement age could be less, at two years.

- The consumption losses from reforms that rely on a single instrument are significantly larger than those when a mix of instruments is used, at least for one

of the generations (Figure 2.2.1). Combining the three measures helps ensure the burden is shared across the young and old, potentially contributing to the acceptability and feasibility of reforms (see also the October 2024 *World Economic Outlook*, Chapter 3, and the April 2025 *Fiscal Monitor*, Chapter 2).

- The size of required fiscal measures is more profound and aggregate consumption losses are larger when the reforms are postponed for 10 years compared with those in a scenario in which they are implemented immediately. For instance, containing the rise in public debt induced by aging requires a 6-year increase in the retirement age if the reform is carried out immediately, but an 8-year increase is needed if the reform is postponed by 10 years. Moreover, the consumption losses from postponing reforms usually fall disproportionately on the young compared with the old.

In summary, policymakers should act sooner rather than later, using a combination of tools to ensure a fairer distribution of the burden across generations and by doing so enhance the feasibility and acceptability of pension reforms. Although the exercise here is calibrated for a typical advanced economy, with a population that has already aged significantly, the lessons are even more pertinent for emerging market economies and low-income developing countries. As of today, their old-age dependency ratios are lower than those of advanced economies. However, they will experience a faster pace of population aging than did the latter, which means they will have less time to react.

### Box 2.3. The Impact of AI for Older Workers

Artificial intelligence (AI) is rapidly reshaping labor markets, transforming the way individuals work, communicate, and solve complex problems. Although recent advances in AI technology hold great potential to boost productivity by assisting workers and enabling them to focus more on complex and high-value tasks, they also pose risks by rendering certain skills obsolete, thereby increasing the risk of unemployment. Older workers (ages 55 and older) are particularly vulnerable, as historical evidence suggests that they are less likely to adapt to new technologies and transition to new occupations (Autor and Dorn 2009). Without adequate policy interventions, disruptions resulting from the realization of these risks may lead to reduced labor market participation, lower numbers of working hours, transitions to less suitable roles, premature workforce withdrawal, or any combination of these outcomes—further exacerbating labor market pressures in aging economies. However, if older workers are concentrated in occupations expected to expand and experience productivity gains as a result of AI, they may be well positioned to benefit from AI advancements, as long as they are able to use new technologies.

To measure the initial impact of AI on labor markets in a context of aging populations, this box examines both AI exposure and its potential to complement older workers. Occupations can be grouped into three categories: those at high risk of labor substitution (high exposure and low complementarity, or HELC), those likely to experience productivity and wage boosts (high exposure and high complementarity, or HEHC), and those less affected by AI adoption (low exposure).<sup>1</sup> Regardless of demographic shifts,

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<sup>1</sup>Exposure is measured by the extent to which AI can replicate skills essential for a given occupation (Felten, Raj, and Seamans 2021), whereas the degree of complementarity measures how likely AI is to augment workers in certain occupations (Pizzinelli and others 2023). The complementary measure incorporates broader occupational factors that influence the likelihood of benefiting from AI adoption; see Pizzinelli and others (2023) for details.

ongoing labor market trends indicate that occupations vulnerable to automation are already losing ground to those involving AI-enhanced roles. For instance, in the United States, vacancies in HELC occupations have expanded at a slower pace in locations with greater AI adoption, whereas HEHC job vacancies have remained stable or even increased slightly in these areas (Pizzinelli and others 2023).

The likely impact of AI on older workers, in a manner similar to that in which it operates on younger cohorts, will depend largely on their levels of education (Figure 2.3.1). Workers with at most a high school diploma are predominantly employed in occupations with low exposure to AI, making them less susceptible to disruption from AI adoption. In contrast, workers with tertiary education are more exposed to AI, with more than 80 percent employed in AI-intensive occupations. However, most of those are concentrated in HEHC occupations, poised for productivity and wage gains.<sup>2</sup> This suggests that, for a given educational level, older workers may benefit more from AI adoption than younger cohorts, as the former are relatively more concentrated in HEHC occupations.

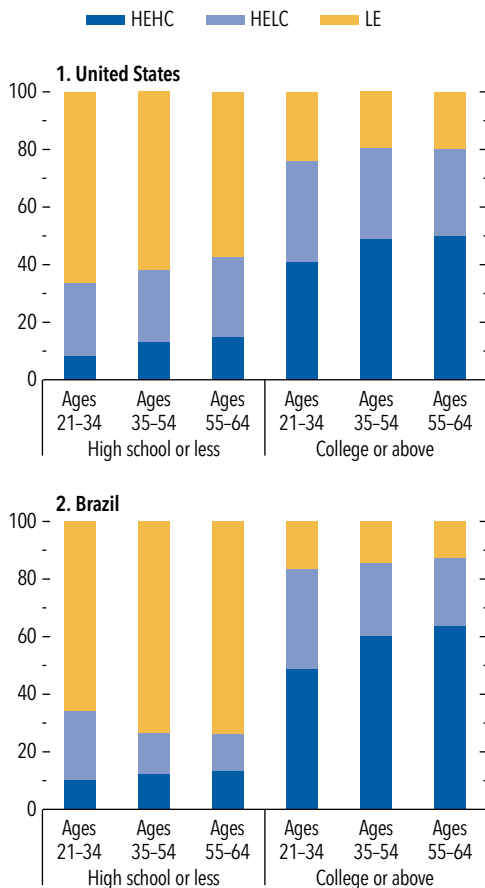
Interestingly, several features of jobs with high AI exposure are aligned with older workers' preferences. Over the past three decades, there has been a general rise in age-friendly jobs—characterized by less-demanding physical activity, lower levels of job hazards, and moderate work paces (Acemoglu, Mühlbach, and Scott 2022). Such features are attractive for older workers and align with the positive gains in their cognitive capacities amid healthy aging documented in this chapter.<sup>3</sup> Indeed, data for the United States suggest that AI-exposed jobs are compatible

<sup>2</sup>This is based on data for Brazil (National Household Sample Survey) and the United States (Current Population Survey). About 65 percent of workers in Brazil and 45 percent in the United States work in HEHC occupations.

<sup>3</sup>Acemoglu, Mühlbach, and Scott (2022) find that this rise in age-friendly jobs has tended to benefit females, college graduates, and older workers (especially females, those with college education, or both), whereas male graduates have benefited the least.

**Box 2.3 (continued)**

**Figure 2.3.1. Employment Shares: AI Exposure and Complementarity (Percent)**

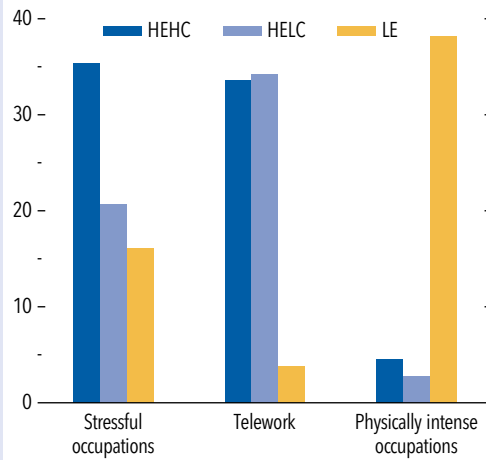


Sources: Brazil National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílios) microdata; United States Current Population Survey; and IMF staff calculations.

Note: HEHC = high exposure, high complementarity; HELC = high exposure, low complementarity; LE = low exposure.

**Figure 2.3.2. AI Exposure and Age-Friendliness, United States, Ages 55 and Older (Share of occupations, percent)**

(Share of occupations, percent)



Sources: United States Current Population Survey microdata; and IMF staff calculations.

Note: The figure shows the share of workers who report their jobs having these characteristics, by occupation group. Data on working from home rely on survey data in 2023 and 2024; other variables consider the period 2010-19. HEHC = high exposure, high complementarity; HELC = high exposure, low complementarity; LE = low exposure.

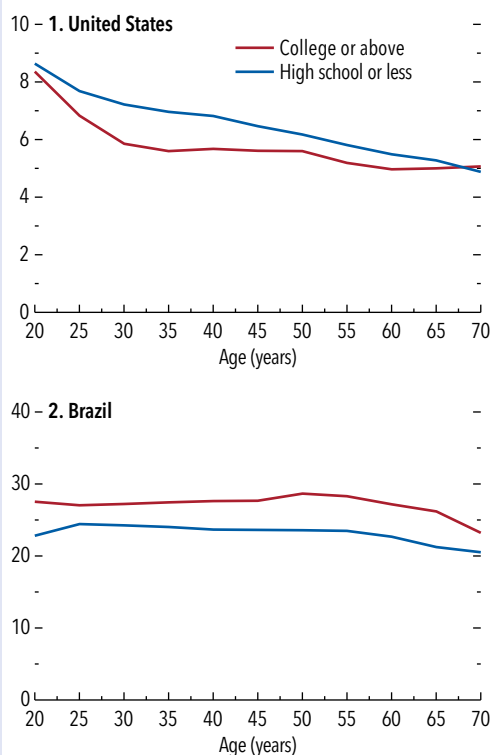
with working from home, and involve less physical effort, relative to low-exposure jobs (Figure 2.3.2), which enhances their appeal to older workers, especially given that these AI-exposed jobs also generally offer higher earnings. However, these same occupations also involve higher levels of responsibility, such as critical decision making, which can increase

**Box 2.3 (continued)**

stress and reduce the occupations’ desirability among older workers. Despite these challenges, older workers are already more represented in occupations poised to benefit from AI than in those at risk from it. These findings suggest that improving job conditions—particularly through stress management, remote work options, and flexibility—could help retain older workers in AI-enhanced roles.

Targeted policies remain necessary for older workers in HELC occupations. Across different education levels, 20–30 percent of older workers are employed in HELC jobs vulnerable to AI-driven disruptions. This group is particularly at risk, as historical data suggest older workers are less likely to switch jobs or occupations (Figure 2.3.3). As labor demand for HELC occupations declines, the ability of these workers to relocate to growing sectors of the economy may be limited, especially during the late stages of their careers. This highlights the need for targeted policies that facilitate job transitions. Active labor market programs can help older workers adapt to new technologies, and job transition support can mitigate the risk of early retirement from job displacement.

**Figure 2.3.3. Workers’ Probability of Transition across Occupations, by Age (Percent)**



Sources: Brazil National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílios) microdata; United States Current Population Survey; and IMF staff calculations.

Note: The figure shows transitions across occupations measured using the four-digit US Census Bureau 2010 classification at a monthly frequency for the United States and the four-digit International Standard Classification of Occupations (ISCO) 2008 classification at a quarterly frequency for Brazil.

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*Emerging market and developing economies have found themselves increasingly on the receiving end of migrant and refugee flows, hosting the lion's share of the latter. This chapter examines how an economy's policies to manage legal inflows of migrants and refugees can have important spillovers to other destination and transit economies, as well as the economies from which these flows originate. Tighter policies in other jurisdictions can increase inflows to a given economy by 10 percent over five years. Furthermore, output in an average economy receiving these additional inflows can increase by 0.2 percent over the same horizon. The overall effect on output can often be modest, as inflows can strain local resources and refugees tend to be less well matched with skills needs in local labor markets. However, output effects can be larger should the skills of migrants and refugees complement those of natives. The policy emphasis is on improving the integration of migrants and refugees and minimizing skills mismatches. In emerging market and developing economies, the returns from better integrating refugees can be particularly large. Furthermore, measures are needed to alleviate pressures on local services and infrastructure, by prioritizing productive public investment and promoting private sector development. International policy cooperation can help distribute the short-term costs of hosting large and unexpected inflows more evenly across economies and improve outcomes over the long term.*

## Introduction

The legal movement of migrants and refugees has become an increasingly familiar fixture of public debate. Flows, as a share of the global population, steadily increased from the late 1990s

The authors of this chapter are Paula Beltran Saavedra, Nicolas Fernandez-Arias, Shushanik Hakobyan, Samuel Mann, Neil Meads, and Carolina Osorio Buitron, under the guidance of Aqib Aslam, and with support from Shan Chen, Camara Kidd, Xiaomeng Mei, and Johannes Rosenbusch. It includes contributions from Desire Kanga, Roland Kpodar, Manasa Patnam, and Annalaura Sacco. Lorenzo Caliendo, Fernando Parro, and Timo Tonassi were external consultants. The authors thank Michael Clemens for his invaluable comments.

until the global financial crisis, broadly in line with familiar globalization trends for goods and capital (Figure 3.1).

As of 2024, the global stock of legal migrants and refugees had reached 304 million—or 3.7 percent of the global population—almost double that observed in 1995, with about one in six being refugees or asylum seekers. Furthermore, about 40 percent of migrants and 75 percent of refugees now reside in emerging market and developing economies.

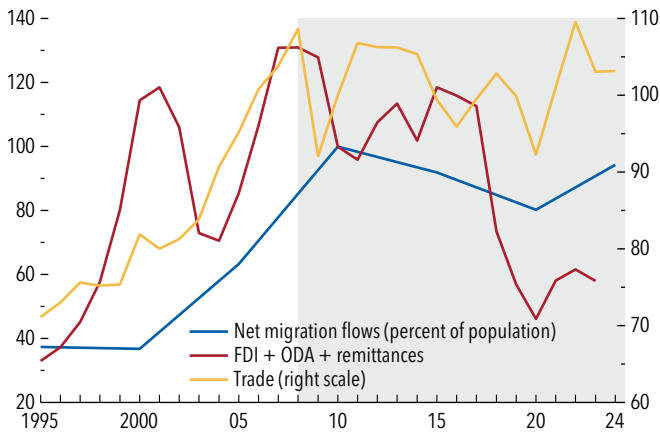
These patterns are the result of “pull” and “push” factors—including geopolitical shocks and natural disasters, which have increased in frequency—and the configuration of migration and refugee policies. Policies in destination economies, in particular, are likely to have played an important role by altering frictions—and therefore the costs and benefits—associated with individual migration decisions.

Just as policies have helped shape the level and composition of observed legal flows, so too have changes in the acceptance of migrants and refugees, which has been deteriorating in several major destination economies (Figure 3.2, panel 1). Increased media coverage of migration has further driven policy discourse (Figure 3.2, panel 2). Survey responses suggest that migration-related pressures are also unlikely to abate, because the intention to migrate remains robust despite the inability of all potential migrants to reach their preferred destination (Figure 3.2, panel 3). Migrants from emerging market and developing economies often aspire to move to advanced economies—either within or outside their region—but they are more likely to end up in other nearby economies within the same income group.

This chapter examines spillovers from changes in migration and refugee policies in destination economies to other jurisdictions, unlike previous work, which focuses on the impact of flows on origin and destination economies. With globalization fatigue driving increasing barriers to the movement of both goods and people and a weak global growth outlook, it is important for policymakers to understand the impact

**Figure 3.1. Global Trends**

(Percent of GDP, 2010 = 100, unless noted otherwise)



Sources: Eurostat; Organisation for Economic Co-operation and Development; United Nations Department of Economic and Social Affairs; World Bank, *World Development Indicators*; and IMF staff calculations.

Note: Foreign direct investment is smoothed using a three-year moving average. The shaded area corresponds to the period after the global financial crisis, which coincides with the period in which globalization started to slow down. FDI = foreign direct investment; ODA = official development assistance.

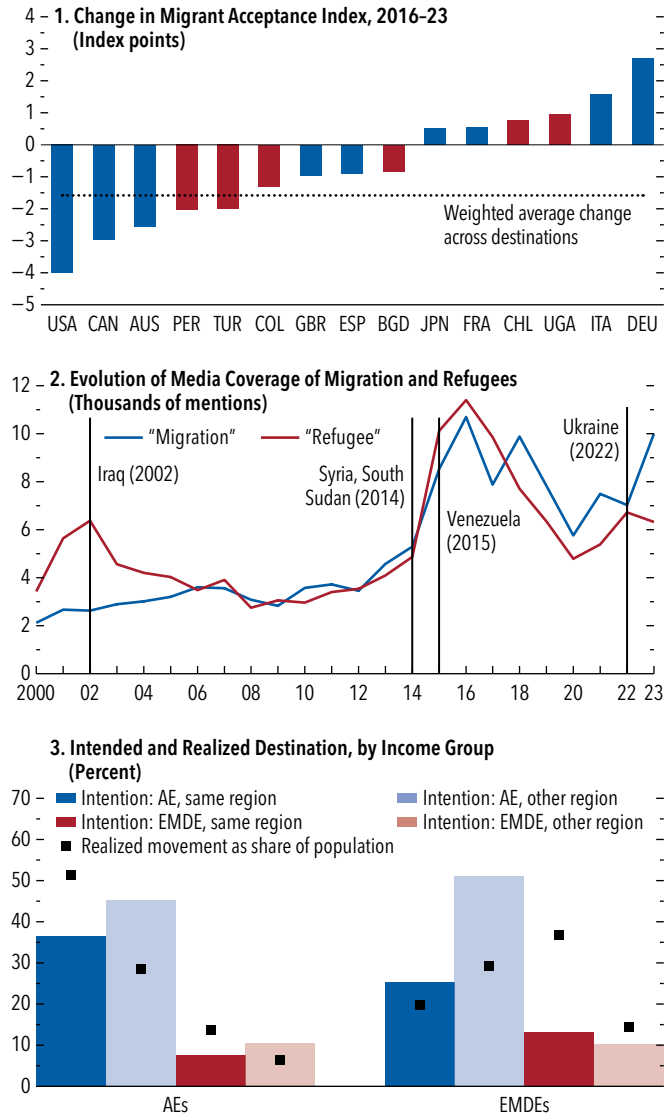
of changes in migration and refugee policies. Specifically, the chapter asks the following questions:

- Do changes in migration and refugee policies divert legal migrant and refugee flows to other economies or alter their composition?
- How large and significant have spillovers to output from migration and refugee policy changes been?
- Could international cooperation improve economic outcomes by distributing flows more evenly across economies?

The analysis in the chapter focuses exclusively on “regular”—also referred to as “legal”—cross-border movement of migrants and refugees. Severe data constraints preclude analysis in the chapter of irregular—also referred to as “illegal”—movement of people.<sup>1</sup> The term *migrant* is used to denote those persons who voluntarily leave their countries of origin for a variety of reasons, including to pursue better economic opportunities. In contrast, the term *refugee* refers to those persons who are forced to flee their countries of

<sup>1</sup>Irregular migration is not defined in international law, but it broadly covers the movement of persons that takes place outside the laws, regulations, or international agreements governing the entry into or exit from the state of origin, transit, or destination. By the very nature of these flows being outside legal pathways, severe data limitations and selection bias preclude the analysis of such flows.

**Figure 3.2. Migration Perceptions and Preferences**



Sources: Abel and Cohen 2019; Factiva; Gallup; United Nations Department of Economic and Social Affairs; and IMF staff calculations.

Note: In panel 1, the Migrant Acceptance Index ranges from 0–9 and is based on responses for unemployed and underemployed individuals for top destination countries (see Figure 3.3, panel 1). Destinations reported using International Organization for Standardization (ISO) country codes. Weighted average is based on 2024 migrant stock data. For Canada and the United States, 2017 is the base year. Emerging market and developing economies are highlighted in red, advanced economies in blue. Panel 2 shows media mentions of the terms “migration” and “refugee” across nine languages (English, Finnish, French, German, Italian, Japanese, Portuguese, Spanish, and Swedish). Vertical lines denote key episodes of migration and refugee flows. In panel 3, intended destination (bars) is based on average of survey responses between 2015 and 2019. Realized destination (black squares) is based on flows between 2015 and 2020. The sample includes 144 countries. “Same region” refers to movements within the same geographic region; “other region” refers to movements outside the same geographic region. AEs = advanced economies; EMDEs = emerging market and developing economies.

origin and are unable or unwilling to return and are afforded protection under international law.

The scale of migrant and refugee flows—as well as their integration—can drive economic outcomes in destination economies in the short and long term through changes in labor supply, aggregate demand, congestion, and agglomeration (see Online Annex 3.1 for key definitions, additional details, and labor market outcomes).<sup>2</sup> As a result, inflows of people can have positive effects on output and labor productivity, although (concentrated) increases can drive up short-term costs by straining local infrastructure and reducing capital-to-labor ratios. Effects can also vary according to pathways—refugees tend to face higher barriers to integration and greater skills mismatches than migrants.

The chapter takes existing push and pull factors and migration barriers as given. It starts by documenting key global and regional trends regarding the direction and composition of legal migration and refugee stocks and flows and the evolution of related policies. It then provides a primer on potential spillovers induced by migration and refugee policy changes before presenting empirical evidence on spillovers from such changes, both for legal migration and refugee flows and output. Motivated by this empirical evidence, the final section uses model-based analysis to quantify the growth and long-term welfare impacts of changes in migration and refugee policies—taking into account different pathways and skills. It also provides insights on how international policy coordination can improve outcomes compared with unilateral measures in response to forced-displacement shocks.

The main conclusions of the chapter are as follows:

- Legal migration and refugee flows have been rising, with an increasing role for movement between emerging market and developing economies—particularly for refugees—and with strain being placed on economies with often limited absorptive capacity.
- Rising flows, public discourse, and tensions in key advanced economy destinations have gone hand in hand with migration and refugee policy tightening over time, potentially adding to challenges faced by emerging market and developing economy destinations.
- There is evidence at the global level that spillovers from migration and refugee policy changes work through several channels. These spillovers can be significant in terms of flows of people, but relatively modest in terms of output for the average economy.
  - Policy tightening that deters inflows by 20 percent in one set of economies can result in a significant deflection of people—increasing inflows to other economies by 10 percent cumulatively over five years. Furthermore, policy changes can alter the composition of inflows to a destination economy: For example, tighter policies that reduce migrant inflows by 20 percent over five years can be partly offset by a 30 percent increase in the typically smaller inflows of refugees over the same period.
  - Deflected flows to the final destination—equivalent to an average increase in the immigrant share of its population of about 0.2 percentage points—are associated with a 0.2 percent increase in output after five years.
  - Instead, if other countries tighten only their refugee policies, the resulting diversion of refugees does not generate meaningful output gains in the final destination. However, stronger refugee integration policies can deliver better outcomes, notably among emerging market and developing economies.
- Model-based simulations highlight how policies that deflect legal flows of migrants and refugees to other destinations or induce them to pursue alternative legal pathways can have economic implications between and within destination economies, depending on the degree of labor market integration and skills matches.
  - A reduction in legal migration inflows from policies targeting selected origin economies is partly offset by an increase in refugees from those economies—particularly low-skilled refugees. At the same time, migrants are deflected toward bordering economies.
  - The cumulative economic impact in the short to medium term is a modest lowering of GDP in destination economies, with a small boost to output elsewhere because their labor supply increases.
  - In economies that have received deflected migrants or refugees, increased competition may reduce wages for some workers—notably in the short term—while the incomes of natives engaged in activities complementary to the skills of incoming migrants and refugees increase.

<sup>2</sup>All online annexes are available at [www.imf.org/en/Publications/WEO](http://www.imf.org/en/Publications/WEO).

The analysis is emphatic. Shifts in migration and refugee policies in destination economies can result in spillovers by altering flows of legal migrants and refugees in the global economy. Although these policy changes cannot substitute for actions to sustainably address underlying pull and push factors, particularly those relating to forced displacement, they can help manage flows to these economies' benefit. Improving behind-the-border migration and refugee policies on integration, together with infrastructure investment and active labor market policies, can help ease short-term congestion costs. International cooperation can also help redistribute these costs.

### Migration and Refugee Patterns and Policies

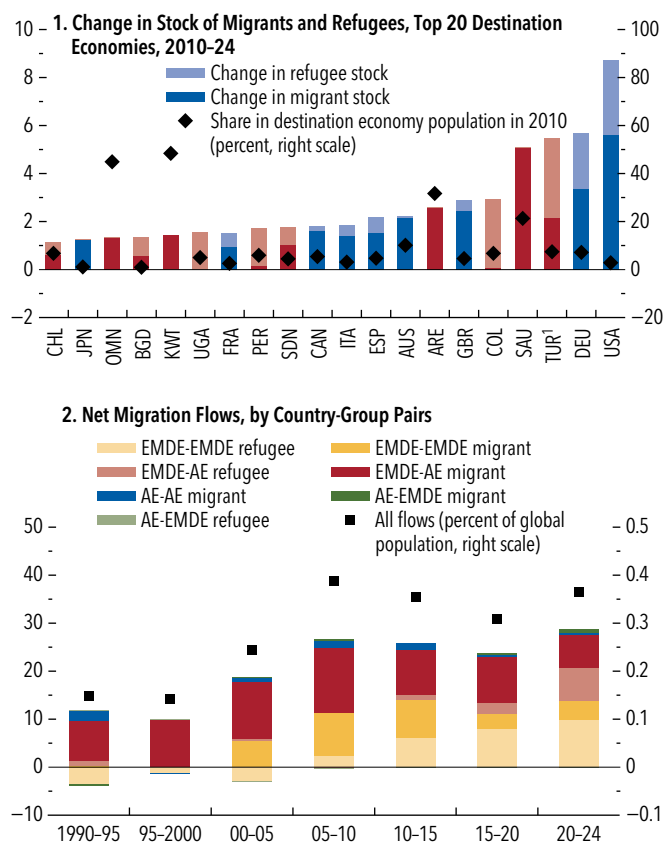
Advanced economies continue to host some of the largest groups of migrants, mostly pulled from emerging market and developing economies.<sup>3</sup> Flows to advanced economies accounted for the bulk of global movements in the late 1990s and early 2000s. Since then, flows of both migrants and refugees between emerging market and developing economies have increased and now account for almost half of overall net flows, with three of the five largest increases in migrant and refugee stocks during 2010–24 having taken place in large emerging market economies (Figure 3.3). During 2020–24, most gross flows were also between economies within the same region and income group, highlighting the fact that migration and refugee journeys are frequently undertaken only over short distances (Figure 3.4).

Recent developments also reflect a significant increase in flows of refugees who have been forcibly displaced or pushed from their homes by political instability, conflict, violence, persecutions, human rights violations, and natural disasters. About two-thirds of the stock of refugees are hosted in neighboring countries, with four out of the top five hosts being emerging market and developing economies (Box 3.1).<sup>4</sup> The global distribution of refugees can

<sup>3</sup>These pull factors involved can include higher standards of living—including higher incomes, better health outcomes, stronger educational systems and institutions, and a safer environment—as well as linguistic, or cultural proximity, or family ties.

<sup>4</sup>Political instability, conflict, and natural disasters can contribute to push individuals from their homes and are key factors behind the increase in migrant and refugee flows between emerging market and developing economies. Deteriorating social and economic conditions and a lack of opportunities in origin economies are other examples of push factors.

**Figure 3.3. Changes in Stocks and Flows of Migrants and Refugees**  
(Millions, unless noted otherwise)



Sources: United Nations Department of Economic and Social Affairs; United Nations High Commissioner for Refugees; and IMF staff calculations.

Note: Panel 1 shows the top 20 destination economies with the largest changes in migrant and refugee stocks from 2010 to 2024. Emerging market and developing economies are highlighted in red (change in migrant stock) and pink (change in refugee stock), advanced economies are highlighted in blue (light blue). Diamonds show the changes in migrant and refugee stocks between 2010 and 2024 as shares of 2010 populations. In panel 2, net flows are computed as differences in stocks. Negative values suggest return migration. Data labels in the figure use International Organization for Standardization (ISO) country codes. AE = advanced economy; EMDE = emerging market and developing economy.

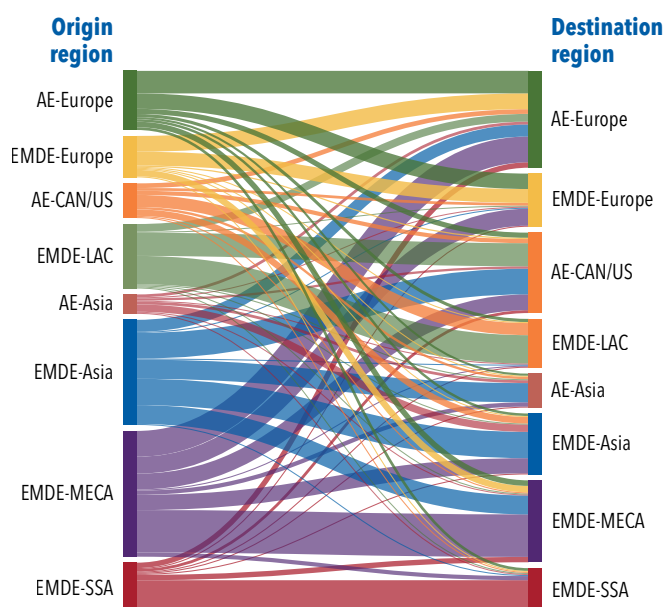
<sup>1</sup>The result is based on only four reporting economies of origin in 2024: Afghanistan, the Islamic Republic of Iran, Iraq, and Syria.

place a disproportionate burden on emerging market and developing economies, which are often not as well equipped as advanced economies to absorb the large inflows involved.

Economic implications will vary according to the characteristics of migrant and refugee inflows. In general, migration has been found to be beneficial for advanced economies.

- Migrants are generally more mobile geographically and occupationally than natives, allowing them

**Figure 3.4. Gross Migration Flows, by Country-Group Pairs, 2020–24**



Sources: United Nations Department of Economics and Social Affairs; and IMF staff calculations.

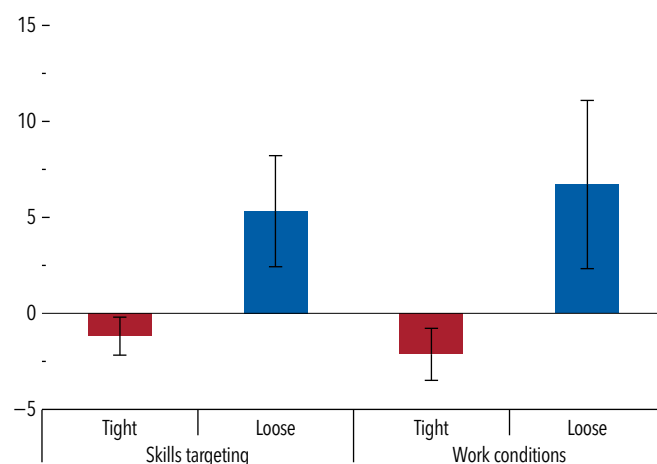
Note: AE = advanced economy; CAN = Canada; EMDE = emerging market and developing economy; MECA = Middle East and Central Asia; LAC = Latin America and the Caribbean; SSA = Sub-Saharan Africa. Migration flows are calculated following Abel and Cohen (2019).

to be more responsive to changes in labor market conditions arising from both cyclical factors and structural changes—such as demographic and sectoral shifts.<sup>5</sup>

- Migrants and refugees—who tend to have significantly lower age profiles than the native population (April 2020 *World Economic Outlook* [WEO], Chapter 4; Box 3.2)—can generate economic gains that outweigh fiscal costs and even ease fiscal pressures if they are well integrated into the labor force (Clemens 2024; Box 3.3; see also the April 2025 WEO, Chapter 2).
- Furthermore, migrants and refugees may help contain (wage push) inflationary pressures by increasing the labor supply, as observed across multiple sectors in advanced economies since the pandemic (Cheremukhin and others 2024). These effects can be more pronounced where native workers have skill levels similar to those of migrants and refugees.

<sup>5</sup>There is evidence that immigrants are more responsive to labor shortages than natives, which reflects, in part, the fact that they have already incurred labor mobility costs. See Online Annex 3.2 for more details.

**Figure 3.5. Change in Share of Employed Migrants and Refugees Associated with Large Increases in Job Vacancy Ratios**  
(Percentage points)



Sources: Eurostat; Haver Analytics; Immigration Policies in Comparison; Luxembourg Income Study Database; and IMF staff calculations.

Note: The sample covers Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) Revision 2 sectors in the European Union, United Kingdom, and United States over the 2010–21 period. Sectors with high job vacancy ratios are defined as the 75th percentile across country-sectors in 2019. The markers denote 90 percent confidence intervals. Tight (loose) policies correspond to the highest (lowest) decile in the last year for which data are available. See Online Annex 3.2 for more details.

However, migrants can also contribute to inflationary pressures by raising demand (Manacorda, Manning, and Wadsworth 2012; April 2020 WEO, Chapter 4; Box 3.4).

- Overall, migration policy frameworks will determine how job vacancies are filled between natives and migrants—the latter tend to mobilize in sectors in which labor demand is high, jobs are hard to fill, and barriers to entry are lower (Figure 3.5; Online Annex 3.2).

Meanwhile, refugees frequently struggle to join the labor force or find employment opportunities that fully utilize their skills. The benefits from their contributions are larger, notably in the long term, if they are well integrated into the labor market. Evidence indicates that the complementarity of migrants and refugee skills with those of natives and the strength of integration policies matter also for emerging market and developing economies (Viseth 2021). However, even in situations in which refugees have a common language and culture, legal and structural barriers mean that they tend to work in the informal sector (Alvarez and others 2022). These findings also suggest that there

is no significant displacement of natives by refugees, but instead there are potential productivity losses from skills mismatches and labor misallocation.

Certain migration and refugee policies have become increasingly restrictive for the median economy in recent decades, whether in response to the stock of existing migrants and refugees, or to recent inflows, or to a failure to integrate.<sup>6</sup> For instance, some countries have tightened external regulations (Figure 3.6, panel 1: see Online Annex 3.1 for key definitions). These are targeted primarily toward migrants, and include skills targeting and minimum ages. Meanwhile, the previous easing trend for internal regulations—including integration measures—has stalled with greater variation across countries (Figure 3.6, panel 2). Furthermore, the stringency of regulation enforcement (controls) has increased, although it has tapered off over time (Figure 3.6, panel 3).

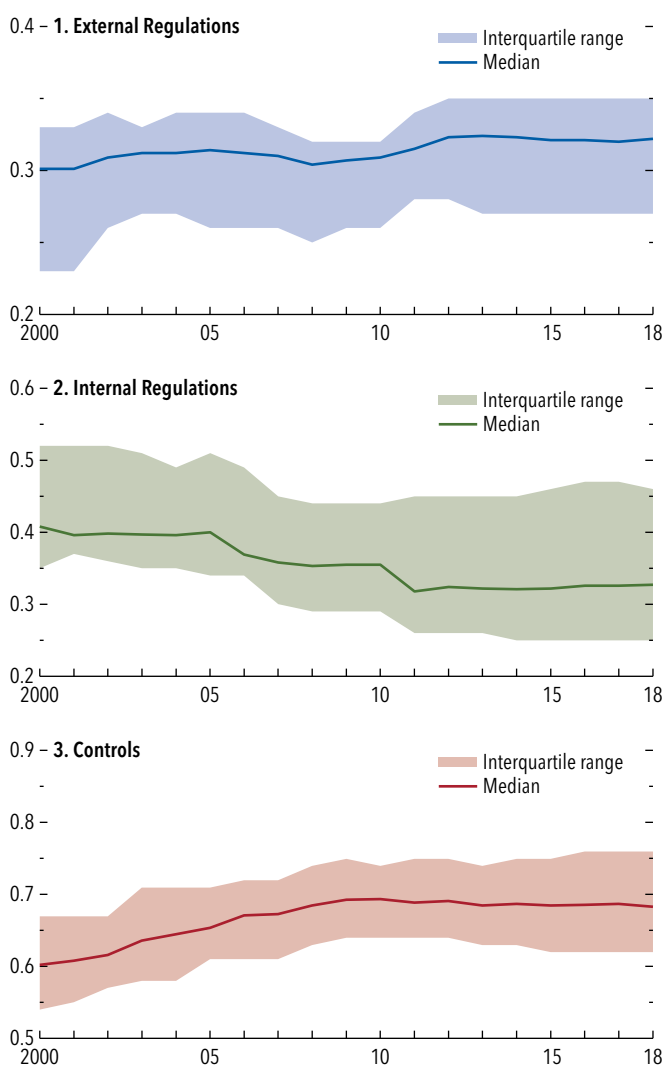
### A Primer on Spillovers from Migration and Refugee Policy Changes

Changes in migration and refugee policies can alter the flow of migrants and refugees within and between economies through four main channels (see Figure 3.7).

- Stricter policies in destination economies may not reduce the overall magnitude of flows from origin economies but may alter their composition, as targeted restrictions can lead to shifts between the flows of migrants and refugees. This is referred to as *categorical substitution*.
- Restrictions in one or more destination economies may divert migrants and refugees to other destinations or leave them stranded in transit economies. This channel is labeled *destination substitution* or *deflection*.
- Migrants and refugees from other origin economies may be encouraged or more likely to fill the gap caused by the restrictions placed on flows from targeted origin economies. This is *origin substitution*.
- In some cases, stricter policies may dissuade migrants from traveling altogether: *origin suppression* or *deterrence*.

<sup>6</sup>Migration and refugee policies are collectively the set of laws, regulations, and programs that governments use to facilitate, regulate, and optimize migration outcomes. Although refugees are afforded protection under international law, their integration into an economy is governed by domestic regulations and controls.

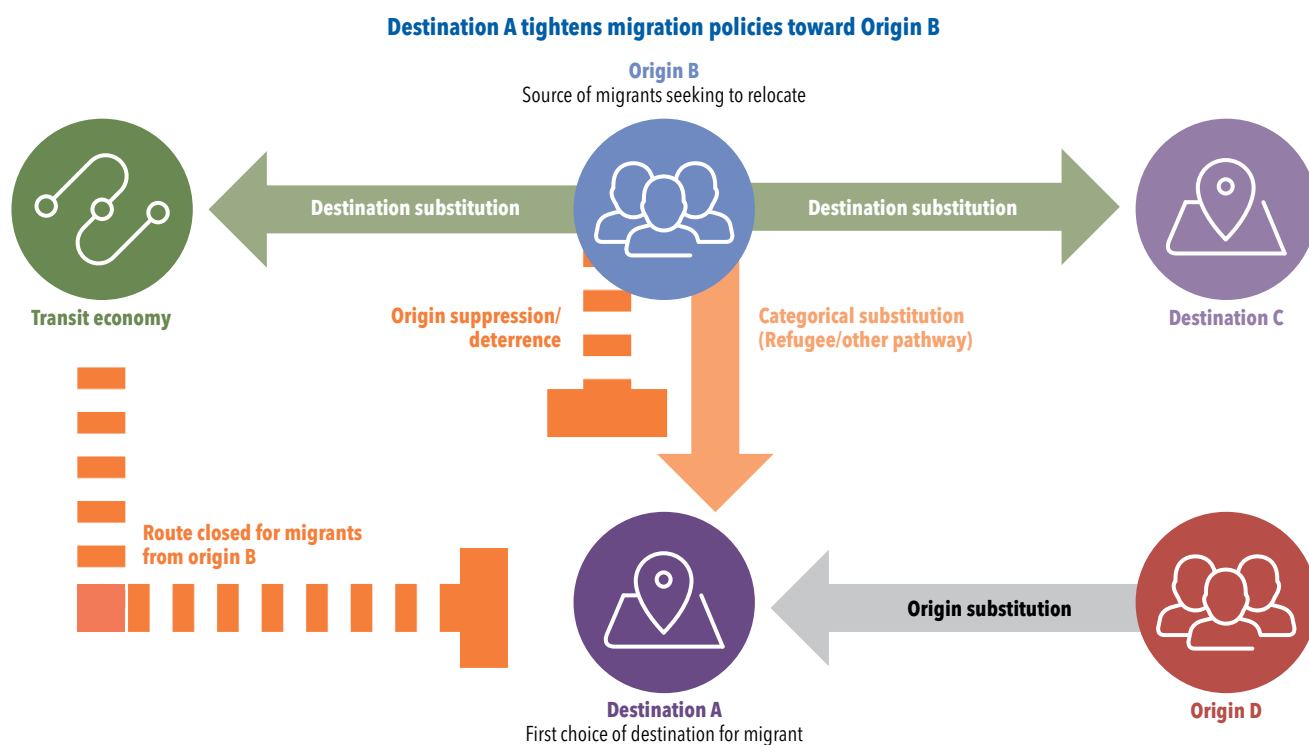
**Figure 3.6. Migration and Refugee Policy Trends**  
(Index, 0 = open, 1 = closed)



Sources: Immigration Policies in Comparison; and IMF staff calculations.  
Note: The sample covers 33 member countries of the Organisation for Economic Co-operation and Development.

### Estimating Spillovers from Migration and Refugee Policy Changes

This section uses a structural gravity model and local projections to assess the historical impact of migration and refugee policy shifts on flows and associated economic outcomes. The gravity framework allows for a globally consistent evaluation of changes in migrant and refugee flows following a change in policies, taking the relative economic size, geography, and bilateral linkages between destination and origin

**Figure 3.7. Categorizing Changes in Migration Flows between Origin and Destination Economies Following a Policy Tightening**

Source: IMF staff.

Note: The figure shows four channels of flows between destination and origin economies following a migration policy tightening in Destination A toward Origin B, all else equal. Migrants from Origin B may be deterred from moving to Destination A (origin suppression/deterrence), may move to Destination A through an alternative pathway (categorical substitution), or may choose to move to an alternative destination or remain in a transit economy (destination substitution). Migrants from other origin economies may also move to Destination A (origin substitution).

economies as given (Online Annex 3.3).<sup>7</sup> Subsequently, output effects for final destination economies in response to policy-induced immigration shocks derived from the gravity model are estimated using local projections (Jordà 2005).

The gravity framework assumes that flows between two economies are directly proportional to their size and inversely proportional to their distance from one another; they are also subject to the relative barriers each country faces with respect to trading partners (“multilateral resistance”). The framework controls for trade linkages, multilateral resistance, and past migration flows but also includes a measure of the exposure of an economy’s migration and refugee flows to the

policies of other destination economies using a “shift-share” instrument.<sup>8</sup> The coefficient on this instrument provides an estimate of the additional migrant and refugee inflows when alternative destination economies tighten migration and refugee policies (effects of *destination substitution*). The gravity model is further extended to estimate the sensitivity of flows of each category—migrant and refugee—to policy changes in destination economies that specifically target either category (*categorical substitution*; Ottaviano, Peri, and Wright 2013).

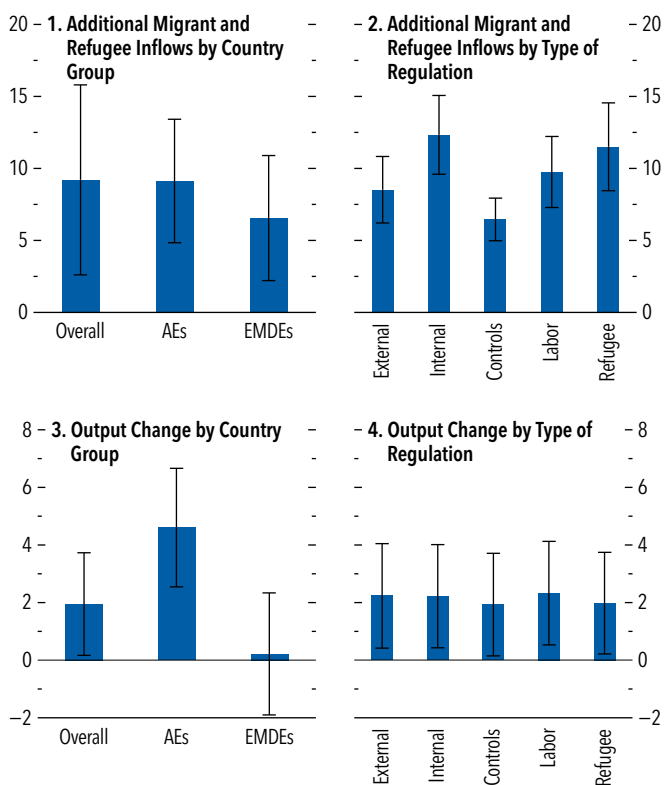
Using data for 194 economies from 1995 to 2020, the gravity model provides clear evidence of *destination substitution*: Tighter policies that deter 20

<sup>7</sup>The analysis builds on Anderson (2011); Bertoli, Fernández-Huertas Moraga, and Ortega (2013); Ortega and Peri (2013); Beverelli and Orefice (2019); and Guichard and Machado (2024), which estimate gravity models adapted for migration.

<sup>8</sup>This shift-share measure is constructed as a weighted average of migration policies across alternative destination economies (Online Annex 3.3).

**Figure 3.8. Destination Substitution in Response to Stricter Migration and Refugee Policies in Other Destinations**

(Cumulative percent change after five years)



Sources: Abel and Cohen 2019; Centre d'Études Prospectives et d'Informations Internationales; Immigration Policies in Comparison; and IMF staff calculations.

Note: The figure uses data for 194 economies over 1995 to 2020. The whiskers show 90 percent confidence intervals. AEs = advanced economies; EMDEs = emerging market and developing economies.

percent of migrant and refugee inflows in one set of destination economies lead to an increase of almost 10 percent in others over five years, all else equal (Figure 3.8, panel 1).<sup>9</sup> These effects are slightly more pronounced for advanced economies than emerging market and developing economies. They are also largest when internal regulations are tightened—making the integration of migrants into destination economies more challenging—and relatively modest when the enforcement of controls is stricter (Figure 3.8, panel 2). Furthermore, a 2 percentage point rise in the share of deflected migrant and refugee inflows in the destination economy's population is associated

<sup>9</sup>The tightening is equivalent to a one-standard-deviation increase in the overall policy measure derived from the Immigration Policies in Comparison (IMPIC) database (Helbling and others 2017).

with an increase in output in that economy of about 2 percent over a five-year period (Figure 3.8, panel 3).<sup>10</sup> As such, for the average destination economy—where inflows are close to 2 percent of the population—a 10 percent increase in inflows equates to an increase in output of about 0.2 percent. The output effects hold regardless of which type of regulation tightens, in line with previous findings (Figure 3.8, panel 4; April 2020 WEO, Chapter 4).<sup>11</sup> Additional analysis using a richer dataset on refugee policies, with greater coverage of emerging market and developing economies, shows a similar impact on migration and refugee inflows as a result of tighter refugee policies elsewhere (Online Annex 3.3).

The short to medium-term-output responses to policy-induced migration shocks vary by destination economy group and migrant category. Additional flows are associated with output increases in advanced economies, whereas the output impact in emerging market and developing economies is muted when integration is not accounted for.<sup>12</sup> This partly reflects not only advanced destination economies' relatively stronger capacity to absorb different categories of arrivals into their labor force, but also their relatively smaller inflows of refugees.<sup>13</sup>

Tightening of migration policies leads to categorical substitution toward refugees (Figure 3.9, panel 1). A tightening designed to reduce average annual migration flows by about 4 percent into a destination economy over one year can be partly offset with an increase of more than 25 percent in the typically smaller refugee inflows to that economy. These additional refugee inflows lead to modest output effects in the short term. The modest effects capture the fact that migrants—who could otherwise have been quickly and efficiently matched to labor market needs, thus boosting output—instead use an alternative pathway

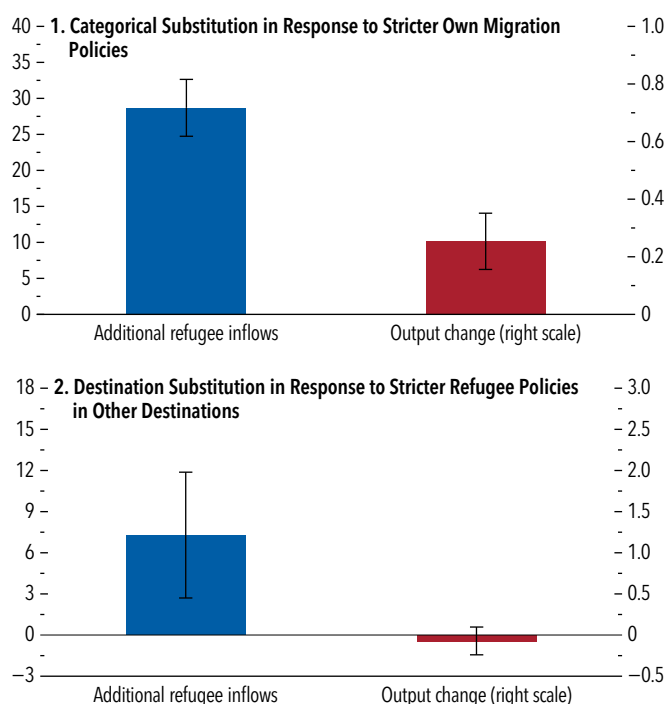
<sup>10</sup>A 2 percentage point rise in the share of deflected migrant and refugee inflows in the destination economy's population is also associated with a decline in output per worker of just under 0.2 percent over a five-year period, although the latter is not precisely estimated.

<sup>11</sup>Chapter 4 of the April 2020 *World Economic Outlook* (WEO) finds that a 1 percent increase in migration inflow-to-employment ratios can increase output in advanced economy destinations by up to 1 percent after five years, with the increase driven by a mix of higher productivity and employment growth.

<sup>12</sup>In line with aggregate results, impacts on GDP per worker within advanced economies and emerging market and developing economies are found to be small and negative, but imprecisely estimated.

<sup>13</sup>Consistent with this observation, Chapter 4 of the April 2020 WEO finds no positive macroeconomic effects from increased refugee inflows in emerging market and developing economies.

**Figure 3.9. Refugee Inflows in Response to Stricter Policies**  
(Percent change)



Sources: Centre d'Études Prospectives et d'Informations Internationales; Immigration Policies in Comparison; United Nations High Commissioner for Refugees; and IMF staff calculations.

Note: The figure uses data for 194 economies over 1995 to 2020. The whiskers show 90 percent confidence intervals.

with greater integration challenges. Furthermore, estimates suggest that a tightening of refugee policies by a set of destinations—designed to reduce refugee inflows into those economies by 60 percent over one year—is associated with an increase in refugee inflows into other economies of close to 8 percent within one year (Figure 3.9, panel 2). Deflected refugee inflows resulting from stricter refugee policies elsewhere—capturing destination substitution effects—do not generate meaningful output gains on average, given absorption challenges. However, estimates using indicators with a better coverage of integration policies—such as naturalization and greater ease of movement within a country—indicate that output effects are much larger for emerging market and developing destination economies where integration policies are stronger (Online Annex 3.3).

Beyond aggregate output effects, shifts in migration flows can have broad-ranging macroeconomic impacts on destination economies. For instance, empirical studies find positive impacts of immigration on

productivity—often attributed to complementarities between native and immigrant workers (Peri 2011; Ortega and Peri 2014; Alesina, Harnoss, and Rapoport 2015; Jaumotte, Koloskova, and Saxena 2016). Such complementarities are also cited by the literature for limited evidence that migration affects the wages or employment of native workers (Kerr and Kerr 2011; Peri 2014). High-skilled immigration, in particular, is associated with better economic outcomes, including higher wages for natives and enhanced firm performance.

The results from the gravity model suggest that there are spillovers from changes in migration and refugee policies. However, care is required to interpret them: Migration and refugee flows may influence policies rather than the other way around, and measurement error may exist, resulting from, among other factors, lack of comprehensive data on bilateral migration policies.<sup>14</sup> Nonetheless, questions remain regarding the macroeconomic implications of policy spillovers for the global economy and their welfare impacts given the existence of multiple spillover channels, alternative legal pathways for immigration, and various integration frictions.

## Modeling Spillovers from Migration and Refugee Policy Changes

In this section, a spatial dynamic general equilibrium model of trade and migration is used to conduct two exercises that evaluate (1) the distributional implications of targeted migration and refugee policy tightening and the associated costs and benefits to different economies over varying time horizons; and (2) whether international coordination can generate better outcomes than unilateral policy changes, by trading off potential short-term costs of immigration for long-term benefits (Caliendo and others 2021, 2023).<sup>15</sup> In addition to modeling changes in the overall flow of migrants and refugees between economies—allowing for both deflection and deterrence—the model's framework distinguishes between the different legal pathways

<sup>14</sup>Relatedly, a gravity framework based on an aggregate assessment of an economy's migration policies may underestimate the magnitude of spillovers, given that adjustments to migration policies often target flows from specific countries of origin or correlate with policy changes in other destination economies.

<sup>15</sup>In the first exercise, the targeted migration policies apply to both new and incumbent migrants, that is, they alter both barriers to enter and those to remain. Both exercises use a historical episode as a baseline.

available for migrants and refugees and varying degrees of labor market integration in destination economies, both of which are necessary to capture the effects of categorical substitution (Online Annex 3.5).

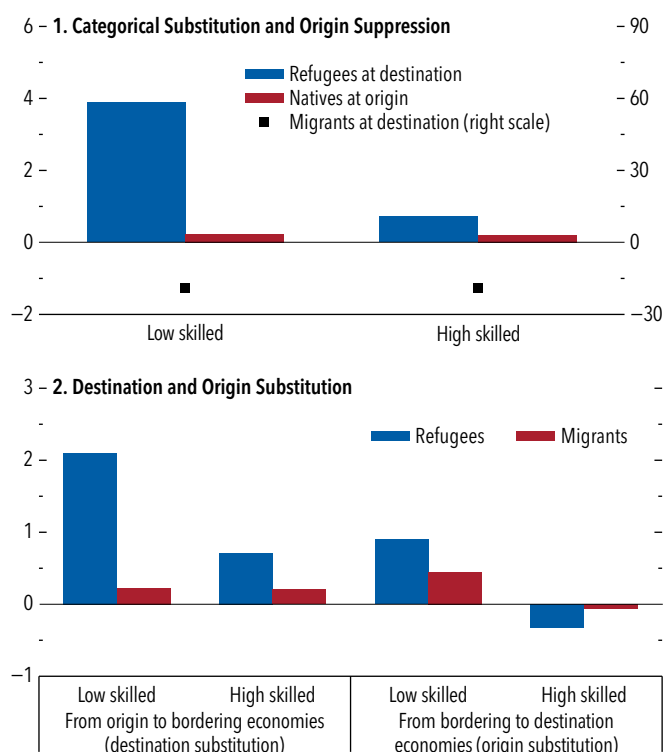
Several important features drive the modeling results. Individuals choose whether and where to migrate and which pathway to use, given policy and nonpolicy migration costs, as well as the real wages they can earn in different destinations, which reflect factors such as the complementarity of their skills with those of residents. The economic impact of policy-induced changes in flows depends largely on two opposing forces: (1) *agglomeration*, wherein a net inflow of migrants can lead to higher total factor productivity from, for example, knowledge spillovers and increased entrepreneurship; and (2) *congestion*, which stems from increasing strain on local services, businesses' equipment and properties, and publicly provided infrastructure, such that an increase in population lowers capital per worker in the short to medium term (Saiz 2007; Melo, Graham, and Noland 2009; Kline and Moretti 2013; Colas and Sachs 2024). Over the long term, economies that successfully build capital can reap the benefits of net migration flows, increasing potential output per capita.

### Distributional Implications of Targeted Migration Policies

In the first exercise, tighter policies in a destination economy that target migrants from certain origin economies are assumed to reduce the stock of migrants from these economies by 20 percent over the short to medium term relative to the baseline.<sup>16</sup> As a result, 0.25 percent more of the native population remains in the origin economies (*origin suppression*). At the same time, flows—of both low- and high-skilled refugees—through the refugee pathway increase (*categorical substitution*). Relative to the baseline, low-skilled refugee flows increase by 4 percent, and high-skilled refugee flows increase by 0.5 percent (Figure 3.10, panel 1).

<sup>16</sup>These flows tend to be small as a share of the overall population in the destination economy. In this exercise, migrants account for 0.3 percent of the population from the origin countries and roughly half of that amount when measured in percent of the population in the destination economy. The 20 percent reduction in economic migration is broadly comparable to the predicted outflows following a one-standard-deviation increase in labor migration indices from the Immigration Policies in Comparison (IMPIC) database—which capture migration tightening of policies targeted at migrants.

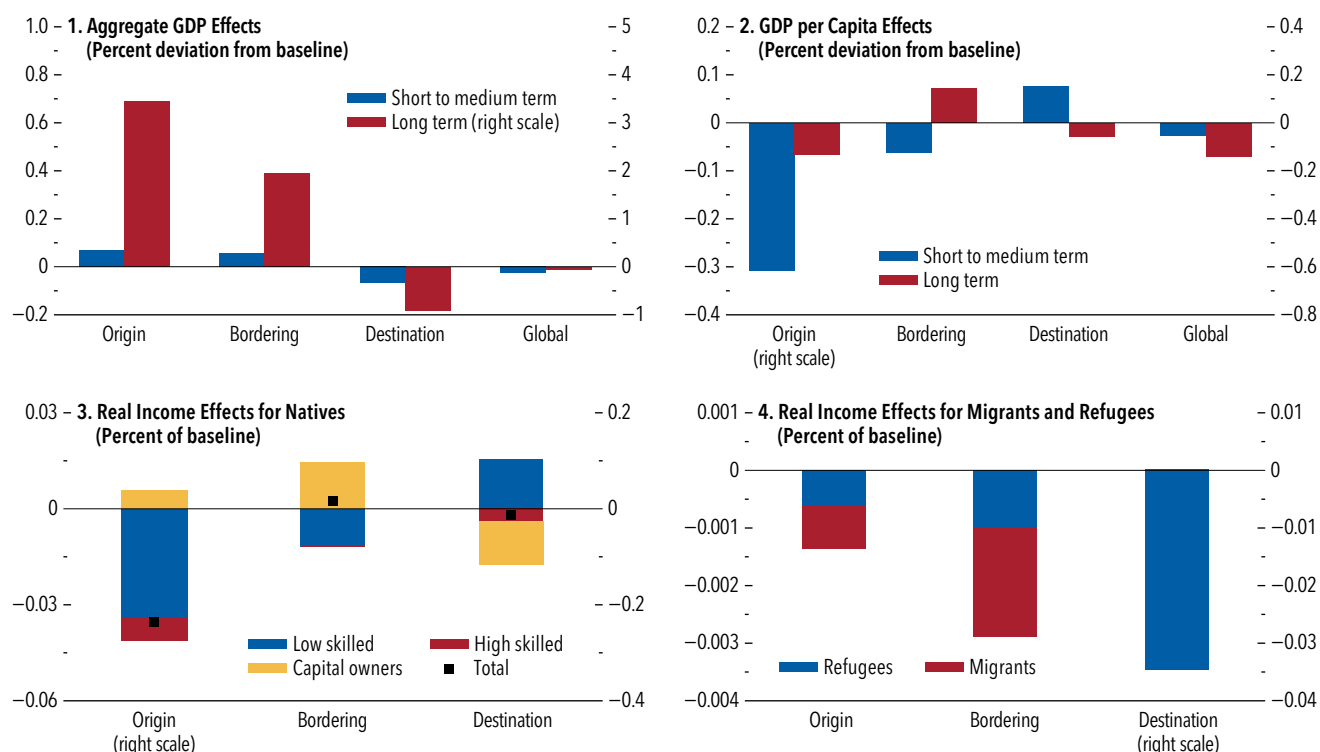
**Figure 3.10. Spillovers in Response to Stricter Migration Policy, by Skill Level**  
(Percent of baseline)



Source: IMF staff calculations.

Note: The panel presents the results from counterfactual simulations of a general equilibrium model of trade and migration. Figures show the responses of migration flows after five years.

The exercise also finds significant deflection of migrants toward bordering destination economies (*destination substitution*). The increase in flows to these alternative destinations from the targeted origin economies is broad-based across migrants and refugees, although larger in the case of low-skilled refugees, which increase by 2 percent (Figure 3.10, panel 2). The increased inflows of low-skilled refugees reflect relatively lower barriers for this pathway compared with the baseline, and the prospect of higher incomes for low-skilled workers. The results also indicate that the implementing jurisdiction receives larger flows of low-skilled migrants and refugees from economies bordering those to which the tighter migration policies were targeted (*origin substitution*). By contrast, a higher share of high-skilled workers from these bordering economies refrain from emigrating altogether to take advantage of the productivity gains from skill complementarities with the deflected low-skilled workers and agglomeration.

**Figure 3.11. Economic Effects of Stricter Economic Migration Policy**


Source: IMF staff calculations.

Note: The figure presents the results from counterfactual simulations of a general equilibrium model of trade and migration. In panels 1 and 2, output responses after five years are denoted as “short to medium term”; lifetime output effects are denoted as “long term.” Panels 3 and 4 show compensating variation in lifetime real income from the policy intervention, weighted by income shares in country of residence.

The resulting reallocation of labor across countries—both its level and its composition—can have redistributive and efficiency implications. In the short to medium term, output in the implementing jurisdiction declines modestly by close to 7 basis points, partly as a result of the smaller flows relative to the baseline, which leads to reduced labor supply and agglomeration (Figure 3.11, panel 1). The reduction in migrants is only partly offset by more refugees (*categorical substitution*), who cannot easily integrate into the labor force and whose skills are more often mismatched. Meanwhile the origin and bordering economies see a small increase in output. Lower output per worker in origin and bordering economies results from greater congestion, while lower inflows alleviate congestion in the implementing jurisdiction (Figure 3.11, panel 2).

Over the long term, output in the implementing jurisdiction is lower relative to the baseline, as capital accumulation slows and output per worker declines. Targeted origin economies also incur costs from lower

output per worker in the long term, with the rate of capital accumulation—absent free capital mobility across countries—being insufficient to offset negative congestion effects.<sup>17</sup> In contrast, bordering economies are assumed to be able to replenish capital over the long term, because the gains from agglomeration are stronger and investment opportunities greater, resulting in higher output per worker relative to the baseline.

Overall, targeted tighter migration policies lead to slightly lower global output than under the baseline in both the short to medium term and in the long term, as more workers remain in relatively lower-productivity economies. Global output declines by about 2 basis points in the short to medium term and 7 basis points over the long term.

<sup>17</sup>This assumption implies conservative output effects, as deviations from free capital mobility imply slower capital adjustment. The latter is consistent with evidence that capital fails to flow from rich to poor countries (April 2024 WEO, Chapter 3), and with the weak effect of remittances on economic growth, as remittance inflows tend to be accompanied by labor outflows (Clemens and McKenzie 2018).

The distributional effects of a targeted tightening of migration policies in destination economies vary within and between economies (Figure 3.11, panels 3 and 4).

- Real incomes of native *capital owners* in the implementing jurisdiction will be lower than the baseline because of the decline in the labor supply and associated productivity losses. In contrast, capital owners in origin and bordering economies will benefit.
- Native *low-skilled workers* in the implementing destination economy will also benefit from the protection afforded by tighter migration controls, but an increase in low-skilled labor in the origin and bordering economies depresses real incomes in those locations.
- With fewer opportunities to migrate, *high-skilled workers* in origin economies are adversely affected because of congestion. High-skilled workers are also worse off in destination economies relative to the baseline because the inflow of complementary low-skilled workers has decreased.
- The negative welfare impact on *natives* in origin economies reflects fewer opportunities to relocate to higher-productivity destinations. Moreover, *migrants* and *refugees* stand to lose in all locations from restricted mobility.

### Can Cooperation Help Destination Economies Achieve Better Outcomes?

The second exercise assesses the potential for international cooperation to help destination economies manage inflows. Three alternative policy scenarios are simulated relative to a baseline. The latter is calibrated using a large historical episode of forced displacement, in which additional inflows impose short- to medium-term congestion costs, which may be more than the implementing jurisdictions would be prepared to accept.<sup>18</sup> The scenarios consider the trade-off at different horizons under alternative policy-tightening settings for a set of bordering (emerging market and developing) destination economies and a large nonbordering (advanced) destination economy.<sup>19</sup>

- The first two scenarios consider unilateral policy tightening by both the bordering and the nonbordering destination economies, under the

<sup>18</sup>The focus of this exercise is on regional cooperation, consistent with findings that most migration and refugee flows are intraregional (Figure 3.4).

<sup>19</sup>The model used in this exercise does not feature skill heterogeneity and has only one migration pathway, owing to data limitations and to focus the analysis on the short- to medium-term impact.

assumption that congestion costs in the baseline are greater than what these economies are prepared to bear: In the first scenario, policy barriers are raised by the bordering emerging market and developing destination economies, and in the second by the large advanced economy. In both cases, policy barriers are temporarily increased to reduce short- to medium-term inflows by 25 percent relative to the baseline.

- The third scenario explores the outcome of international cooperation. Both destinations agree to take more inflows than under the previous two scenarios. Therefore, each jurisdiction temporarily tightens its policies to reduce short- to medium-term net inflows by 12.5 percent relative to the baseline.

In the first two scenarios, tighter policies reduce congestion in each implementing jurisdiction in the short term, boosting per capita consumption relative to the baseline (Figure 3.12). However, there is a long-term cost once the capital stock adjusts, with smaller agglomeration effects lowering total factor productivity. The impact on aggregate consumption in each destination is negative in the short to medium term, as the labor force shrinks relative to the baseline. The smaller labor force leads to lower investment, amplifying the initial decline in aggregate consumption. However, the long-term impact is smaller as policy barriers return to the baseline.

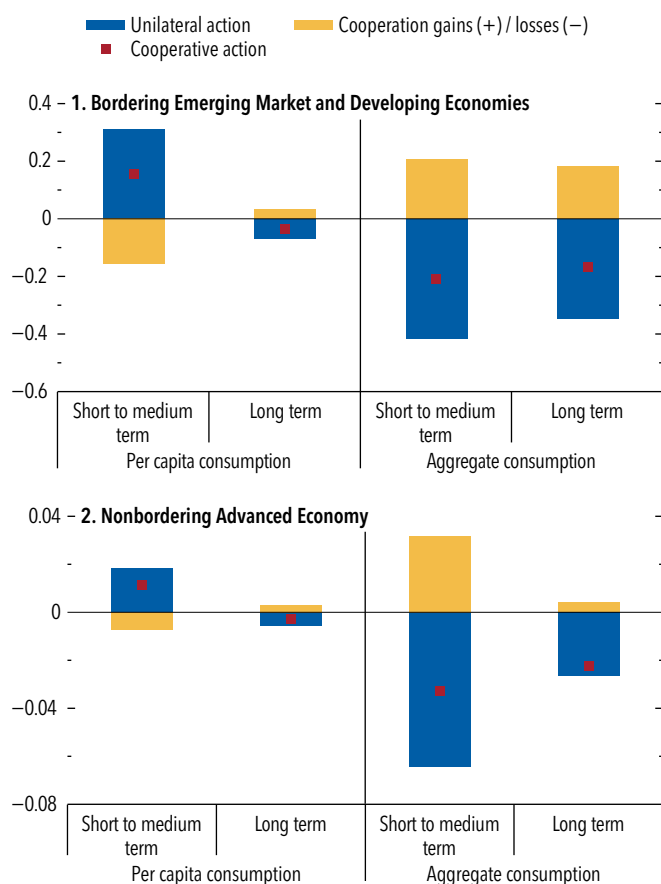
In the third scenario, both sets of destination economies experience more congestion in the short to medium term and stronger agglomeration effects in the long term (Figure 3.12, red squares). Because the labor force does not shrink as much as in the first two scenarios, aggregate consumption decreases by less over time. In this way, destination economies can coordinate to choose policies that produce stronger long-term benefits.

### Conclusions and Policy Implications

Migration and refugee policies have become a critical part of public policy in the context of an anemic growth outlook and growing demographic pressures. In addition to documenting rising legal migration and refugee flows—particularly between emerging market and developing economies—and barriers, the chapter finds the following:

- Changes in migration and refugee policies can have large and significant effects on flows both within and between economies. However, it is important to note that such flows constitute a small share of the

**Figure 3.12. Benefits of Regional Cooperation by Destination**  
(Percent change relative to baseline)



Sources: Abel and Cohen 2019; Caliendo and others 2021; Eora Global Supply Chain Database; Penn World Table; United Nations, Global Migration Database; and IMF staff calculations.

Note: "Short to medium term" refers to results for 2025; "long term" refers to results in 2075.

population of advanced destination economies—averaging about 2 percent over five years.

- Spillovers from migration and refugee policy shifts propagate globally through a mix of channels—primarily *destination substitution* and *categorical substitution*—with macroeconomic implications. By altering the size and composition of legal migrant and refugee flows, policy changes can impose short-term costs—particularly when flows are diverted to jurisdictions in which labor market integration is challenging or skill mismatches are more severe—but also offer long-term gains.
- Beyond the better handling of large unexpected forced displacement shocks, international cooperation can help distribute the short-term costs of hosting refugees more evenly across countries, while alleviating the burden on individual economies.

Such initiatives stand to benefit emerging market and developing economies, which tend to lack fiscal space and absorptive capacity.

Overall, domestic migration and refugee policies can help manage inflows in a beneficial way for destination economies while also providing opportunities for migrants and refugees. Precise policy prescriptions in response to inflows will vary according to country characteristics, economic circumstances, and the nature of the inflows being received. However, overarching recommendations include the following:

- *Improving integration of migrants and refugees to maximize gains for destination economies.* Integration challenges can undermine the benefits of migration and tend to be more severe for refugees than for migrants. Possible explanations include the unexpected nature and scale of these inflows (relative to local populations), as well as the time it takes to be granted refugee status and refugees' relatively limited access to local labor markets thereafter:
  - Emerging market and developing destination economies tend to receive a disproportionate share of refugees, who are more often absorbed into the informal economy. Strengthening incentives to take up formal work—including through well-designed tax and transfer systems and improved access to public health and education services—can help these economies reap the benefits of these inflows.
  - More broadly, integration efforts across destination economies require minimizing domestic barriers to occupational mobility. Policies to improve skills matching among, and employment outcomes for, refugees include minimizing administrative delays, which can cause harmful gaps in employment history; providing language training; and improving recognition and transferability of qualifications. Other policies that can further improve labor market flexibility—for natives, migrants, and refugees—include providing access to job search services and investment in education to allow for upskilling and (re)training of new entrants. Such policies allow migrants to fill labor shortages as they arise, including those in youth-intensive activities.<sup>20</sup>

<sup>20</sup>Many advanced destination economies already use targeted (skills-based) migration policies—such as the H1B visa program in the United States and points-based systems in Australia, Canada, New Zealand, Singapore, and the United Kingdom—to fill short-term shortages in labor markets.

- *Prioritizing productive public spending and structural reforms to alleviate congestion.* Governments in destination economies should seek to minimize the strain that large inflows may put on resources, by prioritizing public investment in infrastructure and health and education services.<sup>21</sup> Furthermore, in the wake of unexpected inflows of refugees and potential short-term congestion costs, governments should also work together to provide humanitarian support and services, as well as capacity development. These efforts should be complemented with domestic reforms to increase private sector development to

<sup>21</sup>Such investments critically rely on the availability of fiscal space and of financing and emphasize a potentially important role for international financial assistance for many emerging market and developing economies. The latter aligns with the Global Compact on Refugees, which seeks to ease pressures on destinations and foster macroeconomic stability and growth (as seen in Jordan [Hoogeveen and Obi 2024]).

help economies better absorb inflows by providing greater opportunities, notably where fiscal space is limited.

Large unexpected and diverted migration and refugee inflows can aggravate social tensions, particularly where the capacity to absorb inflows is limited. Yet implementing restrictive migration and refugee policies can, in some cases, cut off a valuable opportunity to boost productivity and potential output while shifting the burden of congestion elsewhere. Furthermore, migration and refugee policies cannot fully address pressures from forced displacement or structural bottlenecks, including labor market imbalances associated with sectoral and demographic shifts.<sup>22</sup>

<sup>22</sup>It is worth noting that although development may narrow income differentials, and so reduce the desire to migrate, the relaxation of binding credit constraints can itself increase migration (Clemens and Postel 2018).

### Box 3.1. Natural Disasters, Conflict, and Forced Displacement

Forced displacement (see Online Annex 3.1 for definition) can reflect a complex combination of push factors. Although conflict remains the primary driver, climate change and natural disasters can contribute by aggravating vulnerabilities and inequalities (Berlemann and Steinhardt 2017; Kaczan and Orgill-Meyer 2020; UNHCR 2024). Forced displacement typically occurs over short distances—as part of refugees’ search for the closest viable place to find safety—with the degree of cross-border displacement often linked to the size of the affected country (Beltran and Hadzi-Vaskov 2023).

In mid-2024, the stock of forcibly displaced persons reached a record high of 123 million globally, with the number of those internally displaced—at just over half that total—marking its 12th consecutive year of increase (Figure 3.1.1). Although conflict-driven movement accounts for most of the stock of displaced persons, natural disasters have become a key driver of internal displacement. Indeed, over the past 20 years, among the nearly 27 million internally displaced persons each year, about two-thirds of these displacements were triggered by natural disasters.

#### Conflict and Displacement

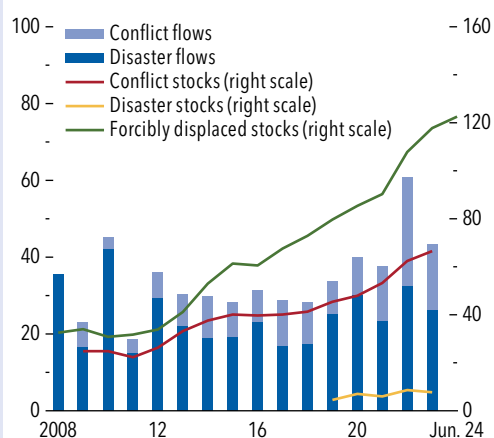
Conflict, violence, and persecution have uprooted millions of people globally. High-intensity conflicts can result in significant refugee flows from the conflict-affected economy that persist longer than those sparked by natural disasters (Figure 3.1.2; April 2024 *Regional Economic Outlook: Middle East and Central Asia*). With skilled and educated individuals more likely to flee from violence, conflicts can also result in a substantial brain drain (Rother and others 2016). Moreover, because legal and administrative barriers in destination economies often limit refugees’ access to formal labor markets and basic services, displacement often pushes many into low-productivity, low-skill, and informal jobs, curtailing their contribution to local economies at their destination (Bassanetti, Sacco, and Tieman, forthcoming).

#### The Intersection of Natural Disasters and Displacement

Natural disasters can affect land productivity; food, energy, and water security; and general habitability, contributing to forced displacement. For instance, sudden-onset natural disasters (for example, storms and floods) can lead to destruction of homes and infrastructure and the interruption of basic services, forcing

The authors of this box are Desire Kanga, Roland Kpodar, Samuel Mann, and Neil Meads.

**Figure 3.1.1. Stocks and Flows of Forcibly Displaced People, 2008–23**  
(Millions)



Sources: Internal Displacement Monitoring Centre; United Nations High Commissioner for Refugees; and IMF staff calculations.

Note: The stock of forcibly displaced people comprises internally displaced persons and those displaced because of conflicts or natural disasters.

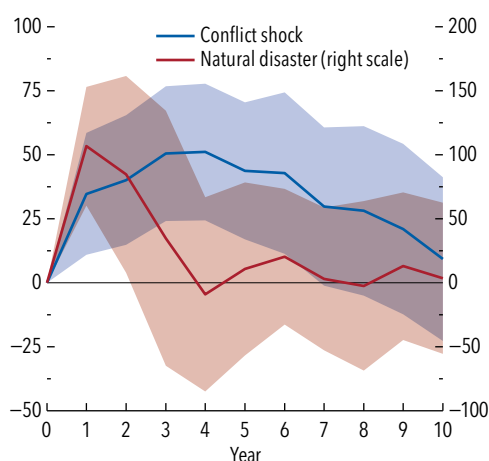
people to flee. Even absent sudden-onset natural disasters, slower-onset phenomena (for example, sea-level rises, desertification, sustained decrease in rainfall, and temperature increases) will progressively erode living conditions, essential resources, and livelihood opportunities, while triggering displacement, and potentially driving conflicts over access to resources and weakening social cohesion (Raleigh 2010; Vesco and others 2020).

At the same time, natural disasters may also reduce household incomes and resources, thereby limiting people’s ability to migrate (Kaczan and Orgill-Meyer 2020).

In Africa, natural disasters in migrants’ and refugees’ countries of origin are positively associated with migration and refugee flows—often to another African country. Higher precipitation levels and floods have been identified as key push factors, with refugee flows from landlocked African economies also sensitive to temperature levels and anomalies (Kanga and others 2024). Such findings are corroborated more generally across emerging market and developing economies—by contributing to cross-border displacement, natural disasters drive much of climatic shocks’ impact on economic outcomes (Beltran and Hadzi-Vaskov 2023; Figure 3.1.3). Impacts are most prominent in small states, where internal mobility is limited during natural

**Box 3.1 (continued)**

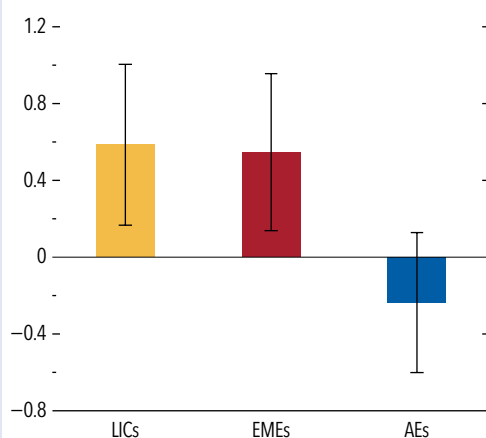
**Figure 3.1.2. Impact of Conflicts and Natural Disasters on Refugee Outflows from LIDCs**  
(Percent)



Sources: EM-DAT: The International Disaster Database; United Nations High Commissioner for Refugees; Uppsala Conflict Data Program Georeferenced Event Dataset Global version 23.1; IMF, April 2024 *Regional Economic Outlook: Middle East and Central Asia*; and IMF staff calculations.

Note: Shock occurs in year 1 and corresponds to an increase in conflict (natural disaster shock) intensity to the 75th percentile of the sample distribution. Included natural disaster shocks are droughts and tropical cyclones. The solid line is the point estimate and the shaded area is the 90 percent confidence intervals range. LIDCs = low-income and developing countries.

**Figure 3.1.3. Response of Migration Outflows to Natural Disasters**  
(Percent of initial population in origin economy)



Sources: Beltran and Hadzi-Vaskov 2023; and IMF staff calculations.

Note: The figure presents the impact of a one-standard-deviation shock from climate disasters on migration outflows by country group. AEs = advanced economies ; EMEs = emerging market economies; LICs = low-income countries.

disasters. These findings underscore the amplifying effect of natural disasters on migration and refugee flows (Koubi, Stoll, and Spilker 2016), similar to the effect of precipitation (Hunter, Murray, and Riosmena 2013) and temperature (Cattaneo and Peri 2016).

*Spillovers from Forced Displacement*

Natural disasters and conflict-related shocks often intersect.<sup>1</sup> The precise impact on displacement across borders will depend on the nature of underlying vulnerabilities—and shocks—and the region in which they occur (Abel and others 2019).<sup>2</sup> What is clear, however, is that most forced displacement occurs within (and between) emerging market and developing economies. Indeed, nearly two-thirds of refugees under the United

<sup>1</sup>About half of forcibly displaced people are living in countries affected by both (Goldberg and others 2024).

<sup>2</sup>Cross-country studies likely underestimate the impact on overall displacement owing to data limitations regarding internal displacement.

Nations High Commissioner for Refugees’ mandate and other people in need of international protection come from just four countries (Afghanistan, Syria, Ukraine, and Venezuela), and nearly 73 percent are hosted in emerging market and developing economies, with half the global total in just 10 such economies.

The concentration of refugees among emerging market and developing destination economies—including many with limited fiscal capacity—highlights the challenges caused by poor integration. Evidence suggests that labor market outcomes of refugees are significantly worse than those of native populations and initially tend to generate net fiscal costs (Evans and Fitzgerald 2017; Brell, Dustmann, and Preston 2020). Recent research on the Middle East, North Africa, and Central Asia also finds that host countries often experience higher fiscal deficits following refugee inflows; the increases are associated with the provision of health, education, and subsistence services. Better integration of refugees can therefore help alleviate such pressures, because better labor market outcomes can not only help resolve labor shortages but also boost tax revenues and, more generally, aggregate demand and GDP growth (Bassanetti, Sacco, and Tieman, forthcoming).

### Box 3.2. The Demographic Dividends from Migration

Increased longevity and falling fertility are driving a secular rise in old-age dependency largely in advanced economies, but also in maturing emerging market economies. Advanced economies are projected to see old-age dependency rise from 20 older people for every 100 working-age individuals at the turn of the century to 50 by the end of 2050, an increase that effectively leaves one person over the age of 65 in the care of two working-age adults. The shrinking labor force is not only holding back potential growth (see the April 2024 *World Economic Outlook*, Chapter 3), but it is also increasing fiscal strains caused by higher health-spending needs alongside fewer workers to pay into pension systems. At the same time, many low-income developing countries are still in the early stages of demographic transition, experiencing a so-called youth bulge, with a high proportion of young people set to enter the workforce. However, challenges associated with high levels of informality, lack of jobs, and limited social protection are preventing the full absorption of these young people into workforces.

This imbalance of labor supply, between youth-poor and youth-rich countries, can be partly alleviated by a flow of younger migrants and refugees into aging countries. Such a global resource reallocation could simultaneously ease the economic pressures from a smaller labor force in destination economies and a lack of opportunities in origin economies. However, these potential gains in a world of asynchronous aging hinge on a market-based match between the skills of young migrants and the youth-intensive comparative advantages of destination economies. Migration policies can support or hinder the redistribution of young workers by affecting individuals' ability to move to countries where their skills are most needed.

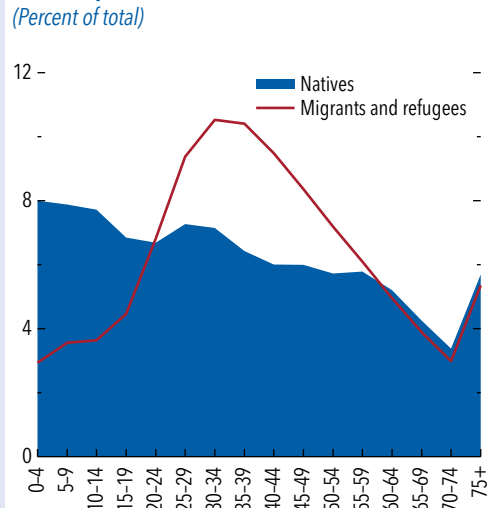
#### *Migration and the Demographic Match*

Globally, migrants and refugees are typically younger—with a larger proportion of them of working age—than natives (Figure 3.2.1). For instance, 78 percent of migrants and refugees are of working age, compared with only 63 percent of native populations. Fertility rates of migrants are also higher than those of natives, providing a longer-term boost to the working-age population.

Enabling age-based labor market matches through migration can yield substantial economic gains. Previous research also finds that immigrants can have

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**Figure 3.2.1. Age Distributions of Migrants and Refugees Compared with Those of Natives, 2020**  
(Percent of total)



Sources: United Nations Department of Economic and Social Affairs; and IMF staff calculations.

Note: "Natives" are derived as total population less migrants.

a positive net fiscal contribution over the medium term (Orrenius 2017; Clemens 2022)—that is, fiscal revenue per migrant and refugee exceeds the cost of public-goods provision, especially when adequate integration measures are in place. A double dividend can be also achieved if migration confers gains on origin economies. This, however, requires productively absorbing migrants' excess labor and positive diaspora spillovers in knowledge transfers and human and physical capital investments linked to remittances inflows, to offset a negative effect on labor supply (Carare and others 2024; Fackler, Giesing, and Laurentsyeva 2020; Leblang and Helms 2023; Williams 2024; Prato 2025).

#### *Alignment of Migration Flows with Comparative Advantage and Demographic Needs*

Countries vary in the youth intensity of their economic activity—the required cognitive and physical skills, which can depend on age. For instance, certain sectors require strong physical skills (such as mining and construction) and naturally favor younger workers. In this context, population aging can have a disproportionate impact on sectors that require young workers (Cai and Stoyanov 2016; Gu and Stoyanov 2019). Skill shortages can emerge, with

**Box 3.2 (continued)**

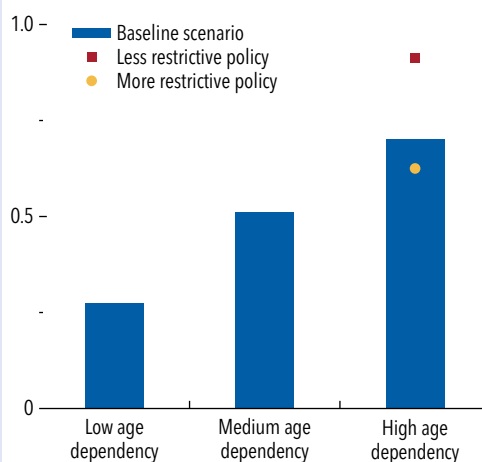
an increased demand for younger workers in sectors requiring peak physical and cognitive abilities. If the matching of cross-border labor flows is efficient, migrants—comprising mainly younger workers—will be allocated to countries that have a *comparative advantage* in youth-intensive sectors.

Local projections using indices of economies’ revealed comparative advantages in youth-dependent industries show that migration patterns broadly match comparative advantages in destination economies: Migrant workers generally move to countries where trade is more dependent on youth-related skills. Indeed, a one-standard-deviation increase in a country’s comparative advantage with respect to youth-intensive trade is associated with higher net migration inflows (Figure 3.2.2).

The overall magnitude of the effect varies with the age dependency of the destination economy as well as its migration policies. The response of migration and refugee inflows to an increase in the youth intensity of trade is greatest for aging countries, suggesting that migration is efficiently channeled not only to countries that specialize in youth-intensive trade, but also to countries likely to face an acute shortage of the cognitive and physical skills required for their trade. Furthermore, more restrictive migration policies lower the elasticity of migration flows to the youth intensity of trade, potentially hindering the efficient global allocation of labor. In aging economies this could mean constraints on alleviating youth-related skills shortages, potentially affecting the structure of these economies’ trade. Such findings are in line with existing literature that underscores the importance of aligning migration policies with labor market needs (Ortega and Peri 2013; Platt, Polavieja, and Radl 2022).

**Figure 3.2.2. Impact of Stronger Comparative Advantages on Net Migration Flows**

(Percent of old-age population)



Sources: International Migration Institute, Determinants of International Migration; United Nations, UN Comtrade Database; World Bank, *World Development Indicators*; and IMF staff calculations.

Note: Youth-related skills, as broadly defined in line with Cai and Stoyanov (2016), include communication, memory, attention, speed of closure, and physical abilities at the occupational level. The baseline scenario corresponds to the average estimated impact for a given age dependency ratio. Low, medium, and high age dependency refer to 1st through 25th percentiles, median, and 75th through 99th percentiles of the distribution. The youth-intensive trade index measures the size-weighted average of youth intensity at the industry level, using industry-specific intensities of youth skills. The figure presents the contemporaneous impact of a one-standard-deviation increase in the youth-intensive trade index on net migration inflows measured as percent of median old-age population. Migration policy is measured using the migration policy index sourced from the Determinants of International Migration data set.

### Box 3.3. The Impact of Immigration on Government Finances

Although migration holds the promise of alleviating structural demographic challenges for countries with aging societies, its overall impact on fiscal outcomes—including revenues, spending pressures, and overall debt burdens—can vary and be difficult to determine with any certainty (Vargas-Silva, Sumption, and Brindle 2024; Vargas-Silva 2015). This box provides an overview of some of the main channels and mechanisms at play.

The fiscal impact of immigration will be influenced by the characteristics of a particular destination economy, the migration pathway used, migrants' age profile, the degree of complementarity of their skills with those of natives, and investment needs to ease public services congestion.

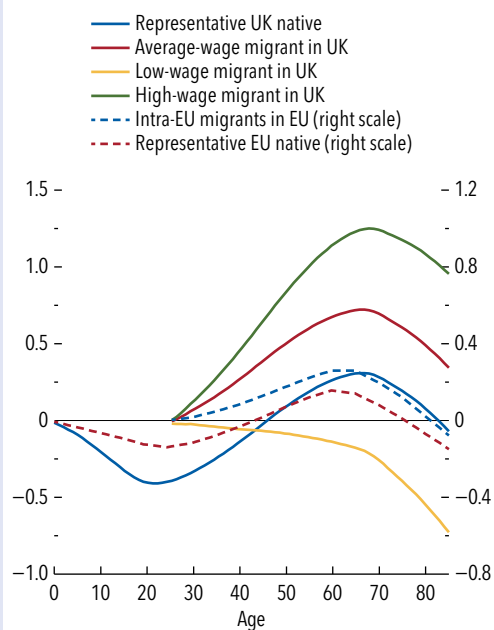
In advanced economies, evidence exists that migrants and refugees have on average a more favorable net fiscal impact than that of natives (Sallam and Christl 2024; UK OBR 2024). Such findings are linked to typical age profiles—with working-age immigrants providing a more positive fiscal boost to destination economies than those outside of working age (de Matos 2021) and evidence that a higher proportion of migrants are of working age than in the native population (Box 3.2). Similarly, the fiscal contributions of some economic migrants are on average greater than those of other immigrants (van de Beek and others 2024). Likewise, migrants who are highly educated (or more highly paid) and relatively young can place substantial downward pressure on budget deficits over their lifetimes, whereas migrants with fewer qualifications (or who are relatively lower paid) and older may induce net fiscal costs (Di Martino 2024; UK OBR 2024; Figure 3.3.1). Taken together, this implies that positive contributions of some migrants may be partly offset by negative contributions of others (Rowthorn 2008). But once capital taxes paid by employers of immigrant labor are taken into consideration, the benefits of working-age immigrants for fiscal outturns may be positive, even those for immigrants who do not have a high school education (Clemens 2022). Furthermore, if migrants do not make claims on government expenditure in old age, then net lifetime benefits to their destination economies may be enhanced (Rowthorn 2008).

Investment and labor market integration challenges may be more pertinent for some emerging market and developing economies because of broader

The author of this box is Samuel Mann.

**Figure 3.3.1. Cumulative Fiscal Impacts from Immigration**

(Millions of British pounds, left scale; millions of euros, right scale)



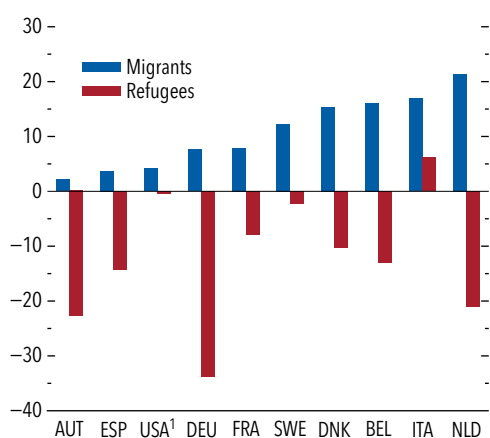
Sources: Christl and others 2022; UK Office for Budget Responsibility 2024; and IMF staff calculations.

Note: "Average-wage migrant in UK" is assumed to have the same economic and fiscal profile as a representative UK resident, with three exceptions. Such migrants are estimated to pay visa fees and the immigration health surcharge, be ineligible for welfare benefits for the first five years of their stay, and require an increase in public spending to keep the capital stock constant.

institutional-capacity constraints. Furthermore, these economies are often the largest recipients of refugee flows, which—if they are large and unexpected—can result in more acute integration challenges and skills mismatches (Evans and Fitzgerald 2017; Brell, Dustmann, and Preston 2020). Indeed, even in regard to advanced economies there is evidence that refugees have lower labor force participation rates than migrants (Figure 3.3.2). Cultural, legal, and structural barriers can also drive refugees into informal employment with relatively lower fiscal benefits than those in the formal sector. The combined result of such challenges is to constrain the potential fiscal benefits from hosting migrants and refugees—indeed, the short-term fiscal costs of hosting refugees are sizable in

**Box 3.3 (continued)**

**Figure 3.3.2. Labor Force Participation Rate Gaps Relative to Those of Natives**  
(Percentage points)



Sources: Eurostat; Integrated Public Use Microdata Series; and IMF staff calculations.

Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

<sup>1</sup>Calculations for migrants include all prime-age foreign nationals.

some countries (see the October 2016 *World Economic Outlook*, Chapter 4). At the same time, overcoming constraints on the full economic participation of refugees could lower costs of assistance in low- and middle-income countries by about 75 percent (World Bank and UNHCR 2024).

The capacity to adapt to migrants and refugees and fully integrate them into the workforce is also

important in determining how quickly economies may benefit from higher labor income tax revenues and increasing returns to capital. Where impediments to business investment (and to capital accumulation) exist, the full benefits from an increase in the supply of labor may be delayed (Caliendo and others 2023). Furthermore, where integration challenges exist, congestion effects including increased demand for public services and infrastructure—for instance, access to health care and housing—may (at least temporarily) place strains on public finances.

Across generations, immigration may provide more pronounced benefits as first-generation immigrants better integrate into destination economies, capital adjusts, and subsequent generations contribute to labor force growth, economic activity, productivity, and higher tax revenues (Sultanov 2021).<sup>1</sup> Sustained economic growth from enhanced productivity, combined with larger revenue streams, can improve fiscal outcomes and, ultimately, the sustainability of public finances. At the same time, descendants of immigrants generally tend to have more favorable net fiscal impacts, reflecting slightly higher educational achievements and higher wages and salaries (Blau and Mackie 2017).

<sup>1</sup>Indeed, projections by the US Congressional Budget Office estimate that a multiyear wave of 6 million immigrants would reduce the US federal deficit by \$0.9 trillion by 2034 (US CBO 2024). The UK Office for Budget Responsibility has projected that an increase in annual net migration from 129,000 to 245,000 arrivals would reduce public debt as a share of GDP by 30 percentage points (UK OBR 2023).

### Box 3.4. Immigration and Inflation

The relationship between migration and inflation is complex. Larger migration flows can do the following:

- *Increase labor supply*, by placing downward pressure on wages, and therefore inflation. Such increases may vary depending on the speed of integration of migrants into labor markets and existing economic and labor market conditions. With migrants often being more mobile and more willing to take low-paying jobs than natives, migration can even cause structural shifts in the relationship between inflation and unemployment (Bentolila, Dolado, and Jimeno 2008).
- *Increase the demand for goods and services*, as they contribute to local consumption following arrival. This can stimulate demand for goods and services and exert upward pressure on inflation in the short term, if the supply of goods and services is inelastic.

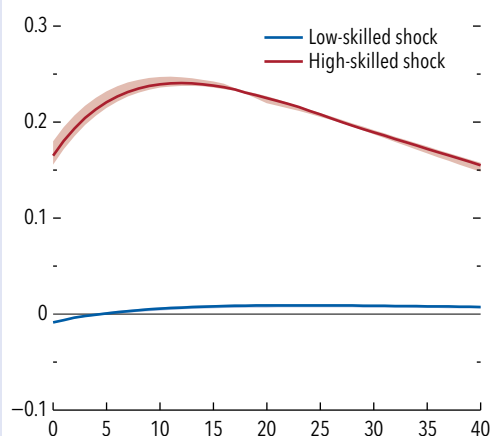
Inflationary dynamics may also vary with complementarities between capital and labor. For instance, stronger complementarity would mean that an expansion in the workforce from migration can enhance capital returns, subsequently boosting investment. If the capital stock is slow to adjust, the initial investment surge may outpace increases in output, generating an inflationary response. Such investment effects may be muted if the complementarity between migrants and capital is lower—particularly relevant where migrants are low-skilled or their skills are poorly matched to labor market needs in destination economies (Cheremukhin and others 2024). These effects can be smaller when capital in a destination economy is not used at full capacity.

Model simulations across a range of countries highlight how these different channels can alter the inflationary implications of migration surges. With capital able to adjust, a surge in high-skilled migration of about 0.7 percent of the population<sup>1</sup> triggers a boost in investment, such that demand effects dominate and inflation increases up to 0.25 percentage

The author of this box is Samuel Mann.

<sup>1</sup>In line with the case in Cheremukhin and others (2024), this shock roughly corresponds to the postpandemic immigration surge seen in the United States.

**Figure 3.4.1. Inflation Response to Immigration Shock**  
(Percentage points)



Sources: Luxembourg Income Study Database; national authorities; Organisation for Economic Co-operation and Development; United Nations Department of Economic and Social Affairs; and IMF staff calculations.

Note: Horizontal axis shows quarters. Responses are in percentage deviations from the detrended steady state. The solid line is the median and the shaded area the interquartile range.

point within three years of the shock (Figure 3.4.1; Online Annex 3.4). In contrast, a similar surge in low-skilled migration has very little impact on inflation. Despite the inflationary effects of stronger aggregate consumption demand from a larger population, these are offset by the disinflationary effects of greater labor supply and muted investment from the assumption of limited complementarity between low-skilled migrant labor and capital.<sup>2</sup>

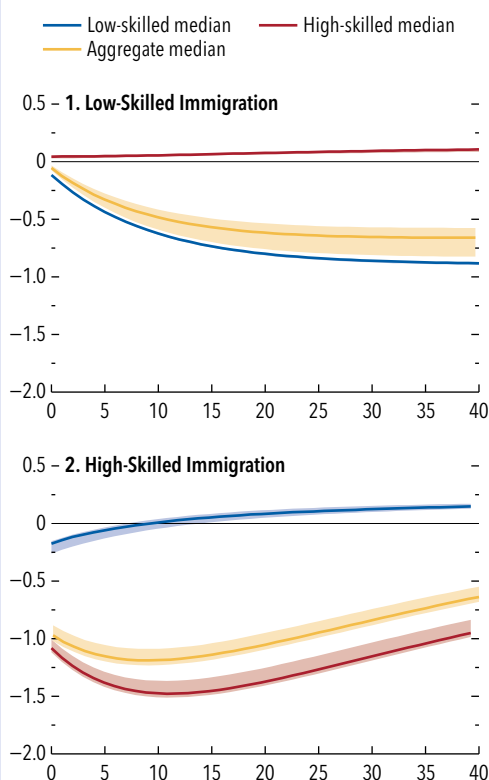
Migration inflows can also have varying effects on wages of natives, migrants, and refugees, depending

<sup>2</sup>More generally, modifications to variables such as the wage skill premium, capital income share, and population growth rates yield similar qualitative outcomes, affirming that Cheremukhin and others' (2024) results for the United States are applicable in a broader context.

**Box 3.4 (continued)**

**Figure 3.4.2. Wage Response to Immigration**

(Percentage points)



Sources: Luxembourg Income Study Database; national authorities; Organisation for Economic Co-operation and Development; United Nations Department of Economic and Social Affairs; and IMF staff calculations.

Note: Horizontal axis shows quarters. Responses are in percentage deviations from the detrended steady state. The solid line is the median and the shaded area the interquartile range.

on their skill levels when joining the workforce. Given complementarity between low-skilled and high-skilled labor, model simulations suggest that a surge in low-skilled immigration tends to marginally increase the wages of high-skilled native workers as their marginal productivity increases (Figure 3.4.2). In contrast, wages for low-skilled native workers decrease slightly—by less than 1 percentage point over the long term—as their marginal productivity declines. In comparison, greater levels of high-skilled migration have the opposite effect, with a marginal decrease in the wages of high-skilled native workers—by up to 1.5 percentage points—and a slight increase in wages of low-skilled native workers over the long term (Figure 3.4.2).

The instances of downward pressure on wages for natives with skills matching those of migrants suggested by these simulations are modest and may be dampened further in practice because of labor market frictions. For instance, downward nominal wage rigidities, the fact that low-skilled migrants are unlikely to be perfect substitutes for low-skilled natives (Clemens and Lewis 2022), and migrant integration challenges can attenuate such pressures. The existing literature also finds only very small effects of migration surges on native employment and wages (Card 1990), and different effects of such migration surges on subgroups of the native workforce (Borjas 2015).

Although at the aggregate level, migration can have a muted effect on wages and inflation, there can still be significant effects on subcomponents of the consumer goods basket and local prices. For instance, in the United States, higher rates of immigration are found to lower local goods inflation, but to increase local housing and utilities inflation (Barrett and Tan 2025).

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