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Slowing Growth: More Than a Rough Patch

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Abstract. Across the world, a structural growth slowdown is underway: at current trends, the global potential growth rate—the maximum rate at which an economy can grow without igniting inflation—is expected to fall to a three-decade low over the remainder of the 2020s. The slowdown could be even more pronounced if financial crises erupt in major economies and spread to other countries, as these types of episodes often lead to lasting damage to potential growth. A persistent and broad-based decline in long-term growth prospects imperils the ability of emerging market and developing economies (EMDEs) to combat poverty, tackle climate change, and meet other key development objectives. These challenges call for an ambitious policy response at the national and global levels.

Keywords: production function; investment; trade; emerging and developing economies.

JEL Classification: E30, E22, E32, E37; F14, O20, O47.

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I. Introduction

In 2015, Kaushik Basu, the World Bank Group’s Chief Economist at the time, asked us to assess long-term growth prospects of emerging market and developing economies (EMDEs). His request inspired us to prepare the study “Slowdown in Emerging Markets: Rough Patch or Prolonged Weakness?”² The question in the title was a deliberate choice since the study documented a synchronous slowdown in these economies during 2010-15 but concluded that cyclical factors partly played a role and that policies could reverse the decline in growth. We now have a definitive answer to the question we posed in the title: These economies are in the midst of a prolonged period of weakness.

Almost a decade later, we take up the question of long-term growth prospects for the global economy and EMDEs, in particular, again in our most recent book (Kose and Ohnsorge 2023). The book argues that the weakness in growth will likely extend for the remainder of the 2020s. It could be even more pronounced if financial crises erupt in major economies and, especially, if they trigger a global recession. The experience of the past two decades has shown that financial crises and recessions cause lasting damage to growth; this would compound the weaknesses in the main drivers of growth that are already embedded in current trends. In addition, the necessary policy interventions could be delayed, as often happened during the past decade, such that global growth over the 2020s could disappoint once again.

It will take a herculean collective policy effort to restore growth in the next decade to the average of the previous one. At the national level, this effort will require these economies to repeat their own best 10-year record in a wide range of policies. At the global level, given the cross-border nature of many challenges confronting growth, the policy response requires stronger cooperation, larger financing, and a reenergized push to mobilize private capital.

Major shocks have battered the global economy over the past three years—including the COVID-19 pandemic and the war in Ukraine. After countries had provided the necessary support for businesses and individuals hurt by

² Our earlier study focused on both cyclical and structural drivers of the slowdown (Didier et al. 2015). This study also acknowledges the importance of cyclical factors but focuses on structural drivers that have become more prominent in explaining the decline in growth. It is much more comprehensive than our earlier paper as it builds on, and expands, multiple studies we have conducted since then. Some of these were featured in the World Bank Group’s flagship *Global Economic Prospects* report in which we examined different aspects of growth in EMDEs.

the pandemic, cyclical policies turned contractionary. The steep rise in inflation over the past two years has led to the sharpest tightening of global monetary policy in four decades. Fiscal policy has also become less supportive following the significant deterioration of government budget balances during the 2020 global recession, when debt levels reached historical highs. Amid these multiple adverse shocks and limited policy space, the global economy experienced over the past three years the sharpest growth slowdown following a global recession.

Even as policy makers confront these short-term challenges, a longer-term setback of considerable importance has been brewing quietly: a persistent decline in long-term growth prospects. In the past decade, growth in EMDEs and advanced economies alike has slowed sharply (table A.1). Global growth declined from a recent peak of 4.5 percent in 2010 to a projected low of 1.7 percent in 2023 (figure 1). The slowdown was widespread: in 80 percent of advanced economies and 75 percent of EMDEs, average annual growth was lower during 2011-21 than during 2000-10.

The slowdown was pronounced in EMDEs. As a result, the pace at which the per capita incomes of these economies are catching up to those of advanced economies (so-called income convergence) has fallen: In 2011-21, EMDE per capita incomes grew 2.0 percentage points a year faster than advanced-economy per capita incomes. But that was considerably smaller than the differential of 3.4 percentage points a year during 2000-10. The convergence process was set back in all EMDE regions. Middle-income EMDEs (MICs) were somewhat harder hit than low-income countries (LICs). MIC per capita income growth slipped by 1.4 percentage points, from 4.9 percent in 2000-10 to 3.5 percent in 2011-21 (table A.2). LIC per capita income growth also slowed, by 1.2 percentage points, to 1.7 percent in 2011-21 from 2.9 percent in 2000-10.

The slowdown represents a deepening crisis of development—because all the fundamental drivers of economic growth have faded (figure 2). Ordinarily one of the most powerful drivers of economic growth, global trade in 2010-19 grew only as fast as overall economic growth, down from twice as fast during 1990-2011. Factor reallocation from less to more productive firms and sectors has also slowed. Gains from better education and health have faded as improvements in education and health care systems have leveled off. Continuing a decade of weakness prior to the pandemic, EMDE investment growth in 2022-24 is projected to average 3.5 percent per year, about half its

2000-21 average.³ After rising over the preceding decades, the growth of the working-age population relative to overall global population growth declined to a three-decade low in 2017. Global policy uncertainty has risen while attitudes towards trade integration have turned more cautious.

On top of this fading growth momentum, a series of shocks—including the pandemic and climate-related disasters—over the past decade have done lasting damage to the development process. This has been reflected in stalling poverty reduction.

II. Growing challenges

Weaker long-term growth gives rise to a wide range of challenges. First, it slows the pace of poverty reduction. At projected growth rates, the goal of reducing global extreme poverty to 3 percent of the population by 2030 is now out of reach. Second, slower output growth tends to reduce the resources available to invest in solving problems confronting the global economy. Without sustained investment growth, it will be difficult, if not impossible, to address climate change and make material progress towards other development goals. Third, slower long-term output growth implies limited job creation and wage growth, which provides fertile ground for social tensions and is likely to entail slower transitions from informal to formal economic activity. Finally, weaker long-term output growth curtails the resources available to pay off mounting debt loads, potentially undermining debt sustainability and leading to financial stress.

III. One tool to meet multiple policy priorities

The intensifying development challenges the world faces are accompanied by a raft of sometimes competing policy priorities: eliminating extreme poverty, reducing inequality, achieving higher growth, or combating climate change. The good news is that addressing these priorities requires the same recipe: sustained and robust investment and productivity growth. Through this mechanism, policy makers can overcome these enormous challenges and deliver sustained, sustainable, and inclusive growth. Such efforts will need to be accompanied by measures to promote investment in human capital, foster gender equality, and strengthen social protection systems.

Achieving this is not easy: policies that are effective in lifting long-term growth and investment are often difficult to design and even more difficult to implement. They tend to involve structural interventions that can

³ Throughout this study, unless otherwise specified, investment refers to real gross fixed capital formation (public and private combined).

sometimes impose substantial, asymmetric costs on parts of the society and therefore can face stiff resistance from vested interests. Some of these policies need to be accompanied by supportive measures to ensure inclusive growth. Moreover, the growth dividends of these policies often take time to accrue. Nonetheless, achieving strong and sustained growth is the only plausible path to durably address climate change, poverty and a wide range of other development challenges.

IV. Understanding long-term growth: A framework

We frame long-term growth around the concept of potential growth—the maximum growth rate that an economy can sustain in the long term at full employment and full capacity without igniting inflation. An economy’s potential GDP growth rate is effectively its speed limit. It influences the full spectrum of policies that determine economic and development outcomes: the level of benchmark interest rates, the scale of government spending, and even the expected size of returns to investors. The speed limit can be raised—through policies that expand the labor supply, boost productivity, and ramp up investment.

Although the concept of potential growth has been much explored, it is not directly observable and must be inferred from other data. Kose and Ohnsorge (2023) develops a variety of measures of potential growth and examines their evolution over time. It presents a detailed discussion of linkages between potential growth and its underlying drivers: capital accumulation (through investment growth), labor force growth, and the growth of total factor productivity (TFP), which is the part of economic growth that results from more efficient use of inputs and which is often the result of technological changes. The study also pays special attention to developments in the trade and services sectors—both of which have been key contributors to productivity growth and changes in labor markets.

V. Contributions to the literature

There is a rich literature on policies to improve long-term growth prospects.⁴

⁴ Several studies have examined the links between growth and inequality (for example, Cerra et al. 2021) or between short-term shocks and long-term output trends (for example, Cerra, Fatas, and Saxena 2020). Others have looked in depth at specific drivers of growth, such as innovation (Aghion, Akcigit, and Howitt 2015; Aghion, Antonin, and Bunel 2021; Aghion and Howitt 2005); institutions (Acemoglu 2012; Acemoglu, Johnson, and Robinson 2005); culture (Gorodnichenko and Roland 2011); political economy (Allen et al. 2014; Acemoglu and Robinson 2012); trade (Rodrik 2017); finance (Arcand, Berkes, and Panizza 2015; Obstfeld 2009); digitalization (Brynjolfsson and McAfee 2014, 2017); or human capital (Schady et al. 2023). Some studies have examined growth prospects in different regions,

Our study makes three key contributions with its introduction of a new database of potential growth, emphasis on global and region-specific growth trends and prospects, and the presentation of a rich menu of policies to deliver better growth outcomes.

Comprehensive database of potential growth. Our study introduces the first comprehensive database of the nine most commonly used estimates of potential output growth for the largest available country sample of up to 173 economies (37 advanced economies and 136 EMDEs) over 1981-2021 (chapter 1). These estimates are based on multiple methodologies. Our study also examines prospects for potential growth based on projections of its structural drivers—growth of physical and human capital, growth of labor supply, and growth of TFP.⁵ In addition, using the new database, it presents the first detailed analysis of the damage to potential growth from many adverse developments in EMDEs—including recessions, banking crises, epidemics, and natural disasters (chapters 1 and 5).⁶

Regional aspects of potential growth and investment. Our study is the first to examine EMDE regional trends and the prospects for the growth of potential output and investment since the onset of the COVID-19 pandemic. In dedicated chapters, our study also discusses regional policy priorities and options to strengthen investment and potential growth (chapter 2 and chapter 4). Its analysis draws on the specific literature and data for each of the six World Bank Group regions: East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), the Middle East and North Africa (MNA), South Asia (SAR), and Sub-Saharan Africa (SSA).

Policies. Kose and Ohnsorge (2023) explores, in a consistent framework, policy options to lift potential growth. In contrast to earlier studies, the discussion

such as Gill and Raiser (2012) for Europe; Ulku and Zaourak (2022) for Central America; Alvarez and de Gregorio (2014) for Latin America; and McMillan, Rodrik, and Sepulveda (2017) for seven country case studies in Africa, Asia, and Latin America. Others, such as Loayza and Pennings (2022), have developed tools to model long-term growth. Finally, a group of studies have examined firm-level drivers of growth prospects (for example, Comin and Mulani 2009; Fisman and Svensson 2007; and Goehuys and Veugelers 2012).

⁵ Previous studies have been confined to a single methodology, such as the production function approach (OECD 2014) or multivariate filters (ADB 2016; IMF 2015). Some earlier studies estimated trends for only a subset of measures of potential growth (for example, Chalaux and Guillemette 2019; Kilic Celik, Kose, and Ohnsorge 2020). The study's focus on long-term potential growth projections also contrasts with the previous literature, which has examined past trends (Asian Development Bank 2016; Dabla-Norris et al. 2015; IMF 2015; OECD 2014).

⁶ Earlier work has estimated the effects of recessions on potential growth but they were primarily confined to OECD countries and to one specific measure of potential growth (Furceri and Mourougane 2012; Mourougane 2017).

of policy options is directly based on empirical analysis.⁷ Some of these policies include reforms of education and healthcare systems as well as labor markets (chapter 5). Our study also presents an extensive menu of policies to boost investment and productivity growth and examines policy interventions geared toward promoting growth in services activity and international trade.

Investment as a key driver of potential growth. As noted above, investment is essential to deliver sustained potential output growth, improve living standards, and make progress in achieving the Sustainable Development Goals (SDGs) and fulfilling commitments made under the Paris Agreement on climate change. Our study provides the first comprehensive analysis of investment growth in a large sample of EMDEs since the pandemic and Russia’s invasion of Ukraine. It examines the likely medium- and long-term consequences of the damage to investment in EMDEs from recent adverse shocks, focusing on the effects on productivity, potential output growth, trade, and the ability to achieve the SDGs and climate-related goals. It also describes a rich menu of policies to revive investment growth.

Trade as a traditional engine of growth. Trade has been a powerful engine for EMDE growth over the past four decades but its role is now under threat. Our study presents a comprehensive analysis of trade costs and avenues to promote trade growth (chapter 6). It goes beyond previous research in assessing the role of trade policy—including on tariffs and participation in trade agreements—in determining trade costs (Arvis et al. 2016; Chen and Novy 2012; World Bank 2021). This analysis is complemented by an event study of the evolution of trade in goods and services around global recessions, including the pandemic-induced global recession of 2020. Building on the econometric analysis, the chapter derives policy options to lower trade costs.

Services as a new engine of growth. High hopes have been placed on the services sector as a new engine of economic growth as traditional engines of growth such as goods trade and resource sectors sputter.⁸ Our study establishes a set of

⁷ Previous studies have investigated the link between actual growth of output or productivity and structural reforms, focusing on the near-term benefits (Prati, Onorato, and Papageorgiou 2013), productivity effects (Adler et al. 2017; Dabla-Norris, Ho, and Kyobe 2016), or a sample consisting of mostly advanced economies (Banerji et al. 2017; IMF 2015, 2016).

⁸ Major shifts are underway in commodity markets as part of the energy transition, as discussed in Baffes and Nagle (2022). Recent work considers the potential of services as an engine of growth and trade (Nayyar, Hallward- Driemeier, and Davies 2021a, 2021b; Park and Noland 2013; OECD 2005; Lee and McKibbin 2018) and trade (Baldwin 2016; Francois and Hoekman 2010). Some recent studies also consider the effects of the pandemic on growth and household income or firm sales distribution (Apedo-Amah et al. 2020; Chetty et al. 2020; Narayan et al. 2022). Our study expands on the growing literature on structural change and productivity growth in EMDEs, which highlights changes in the relative

stylized facts that summarize the role of the services sector in growth and development over the past three decades (chapter 7). It presents growth decompositions that provide estimates of the contributions of subsectors of services as well as the contributions of the growth of factor inputs versus TFP. Our study also documents how the pandemic has affected prospects and policy priorities for services-led growth, building on some recent studies. It assesses future growth opportunities linked to the acceleration in digitalization, building on the literature on how the digital economy is expanding opportunities to boost productivity in the services sector.

VI. Key findings and policy messages

Using a comprehensive database of multiple measures of potential growth, our study examines trends in potential growth and its drivers (especially investment), global and regional prospects for potential growth and investment over the 2020s, and a range of policy options to lift potential growth. It documents three major findings. First, there has been a protracted, broad-based decline in potential growth and its underlying drivers. Major adverse shocks also reduce potential growth by leaving a lasting impact on these drivers. Second, the slowdown in potential growth is expected to persist for the rest of this decade. Finally, while significant challenges confront EMDEs, they are not insurmountable. It is possible to reverse the slowdown in potential growth and chart a sustained, sustainable, and inclusive growth path by implementing ambitious, broad-based and forceful policies at the national and global levels.

VI.1 Longstanding, widespread decline in potential growth

All measures document a widespread decline in potential growth in the decade 2011-21, relative to the preceding decade (chapter 1). Global potential growth fell to 2.6 percent a year during 2011-21 from 3.5 percent a year during 2000-10; meanwhile, EMDE potential growth fell to 5.0 percent a year during 2011-21 from 6.0 percent a year during 2000-10 (table A.3). The weakening of potential growth was highly synchronized across countries: during 2011-21, potential growth was below its 2000-10 average in almost all advanced economies and nearly 60 percent of EMDEs. Among EMDE regions, the steepest slowdown occurred in MNA, followed by EAP, although potential growth in EAP remained higher than in all other EMDE regions except SAR, where potential growth remained broadly unchanged (chapter 2).

contributions of the broader manufacturing and services sectors, and demand- and supply-side factors (Fan, Peters, and Zilibotti 2021; Kinfe Michael and Morshed 2019; McMillan and Rodrik 2011; Nayyar, Hallward-Driemeier, and Davies 2021a, 2021b; Rodrik 2016).

This slowdown in potential growth can be attributed to many factors as all fundamental drivers of growth faded. The period between 2011 and 2021 was marked globally by slower TFP growth, slower labor supply growth, and slower investment growth than in the period 2000-10. In addition, the global economy has been rocked by financial crises, global recessions, bouts of inflation, health crises such as epidemics and a pandemic, climate-related disasters, and wars and conflict of varying severity. Almost all of these shocks, and especially the global recessions, left lasting legacies of damaged drivers of, and slower rates of, potential growth (figure 3). Utilizing a series of econometric approaches, our study quantifies this damage.

Recessions resulted in lasting damage to the productivity capacity of the global economy. National recessions were associated with 1.4 percentage point slower potential growth, on average, even five years later (chapter 1). Over the medium term, recessions tended to have a somewhat more severe impact than did other adverse events—such as banking crises, epidemics, or other natural disasters. The effect of recessions on potential growth operated through multiple channels. Four to five years after a typical recession, investment growth, employment growth, and TFP growth remained significantly lower than in “normal” years—by 3.0 percentage points for investment, 0.7 percentage point for employment, and 0.7 percentage point for TFP.

Banking crises were associated with initially larger declines in potential growth than recessions, peaking at 1.8 percentage points after two years as a result of collapses in investment. However, quick recoveries in investment generally followed, such that the damage to potential growth after five years was only 1.2 percentage points—less than after recessions. In contrast to recessions, banking crises tended to be mainly associated with lasting productivity losses.

Climate change has increased the frequency and severity of weather-related natural disasters. Over the past two decades, these natural disasters have caused a significant decline in potential growth (chapter 5). For example, over the medium-term, depending on the magnitude and speed of reconstruction efforts, damage to potential growth varied from nil to 10 percent three years after the disaster. Some countries, especially small states, have suffered much larger damage than is suggested by the average effect—on average 5 percent of GDP per year. These losses did not occur in a predictable pattern. Instead, it was not uncommon for the damages from a single climate-related disaster to cost a substantial portion of a country’s GDP, or even multiples of GDP in extreme cases.

VI.2 A lost decade in the making? Weaker growth prospects

The slowdown in potential growth during 2011-21 is projected to extend into the remainder of the current decade (figure 4). Projections for its fundamental drivers suggest that global potential growth will slow further, by 0.4 percentage point a year from 2011-21, to an average of 2.2 percent a year in 2022-30, the slowest pace since 2000 (chapter 5). About half of the slowdown is due to demographic factors from an aging population, including slowing growth in the working-age population and declining labor-force participation. EMDE potential growth is projected to slow by 1.0 percentage point a year to an average of 4.0 percent a year in 2022-30. The decline will be internationally widespread: Economies accounting for nearly 80 percent of global GDP, including most EMDEs, are projected to experience a slowdown in potential growth between 2011-21 and 2022-30. All traditional drivers of growth, including trade, are expected to weaken in the remainder of this decade. However, relatively healthier growth is expected in the services sector.

Investment. The slowdown in investment during 2011-21 will likely extend into the remainder of the current decade because of the effects of the COVID-19 pandemic, Russia's invasion of Ukraine, limited policy space, and tight financial conditions (figure 5; chapter 3). In 2022-24, investment growth in EMDEs is projected to average 3.5 percent per year, about half its average annual growth during 2000-21 (chapter 3). Projected investment growth through 2024 will be insufficient to return aggregate EMDE investment to its pre-pandemic trend from 2010-19 (the period between the highly disruptive 2009 and 2020 global recessions). Annual average investment growth in 2022-30 is now forecast to be 0.3-1.8 percentage points lower, on average, than in 2011-21 in all regions except in LAC and SAR, where adverse shocks that depressed investment growth in the 2010s are not expected to recur. After a gradual decline over the past decade, foreign direct investment (FDI) will also likely remain weak over the remainder of the 2020s.

Trade. Global trade growth may weaken by another 0.4 percentage point per year, on average, during the remainder of the current decade compared with 2011-21, owing partly to slower global output growth and partly to the further waning of structural factors that supported rapid trade expansion in recent decades (chapter 6). Fragmentation of trade and investment networks loom large over trade prospects amid policies that favor suppliers from allied countries (friend-shoring) or nearby countries (near-shoring). The historical record also shows that persistently weak investment growth tends to be associated with slow trade growth.

Services. A possible bright spot may be the services sector—provided its productivity potential can be unlocked (chapter 7). In particular, the pandemic has ushered in a pronounced shift toward digitalization as firms moved many of their activities online. This promises productivity gains if it can be harnessed for better service delivery. Since the pandemic, there has also been a shift toward high-skilled offshorable service activities, such as digitally deliverable information and communications technologies (ICTs) and professional services.

VI.3 From technological innovations to the “roaring 2020s”?

The implications of technological innovations for future growth prospects have been a subject of intense debate. Some claim that the global economy will enjoy a surge in economic growth in the coming decades, driven by improvements in productivity thanks to new technologies (Brynjolfsson and McAfee 2014). Others caution that future growth could stall, or even fall, because new technologies will likely have a declining marginal impact on productivity, and structural challenges associated with aging and sluggish growth of investment will adversely affect prospects (Gordon 2016).

As the world gradually emerges from the pandemic-induced recession of 2020, it is tempting to look back to the 1918 Spanish flu and hope for a decade of rapid global growth reminiscent of the “Roaring Twenties” of that era because of recent technological innovations. Building on technological breakthroughs in earlier decades, North America and Europe enjoyed rapid modernization and strong economic growth in the 1920s. Automobiles replaced horse-drawn transportation and became ubiquitous as improvements in assembly lines cut costs. Newly built electrical grids paved the way for rapid industrial and household electrification. The economies of the United States, Japan, and some European countries became more productive. Global growth that averaged 3.6 percent in the 1920s was double that of the preceding two decades.

There is no question about the potential of recent technological innovations to transform our lives across the world, in many dimensions. However, in light of the trends of the past two decades and the persistent slowdown in the fundamental sources of growth, our analysis concludes that the 2020s are more likely to be “disappointing” than “roaring” for the global economy, unless a comprehensive set of policies are put in place.

VI.4 Trends are not destiny: Policies to boost potential growth

It is possible to reverse the slowdown in potential growth through structural policy interventions. Structural policies associated with higher physical capital

investment, improved human capital, and faster labor supply growth could raise potential growth by 0.7 percentage point a year in 2022-30—both globally and in EMDEs. This would offset the 0.4 percentage point decline in global potential growth between 2011-21 and 2022-30 projected in the baseline scenario and most of the 1.0 percentage point slowdown projected for EMDEs (figure 6). Global potential growth would rise to 2.9 percent per year—above its 2011-21 average of 2.6 percent, but still well below its 2000-10 average of 3.5 percent; EMDE potential growth, at 4.7 percent per year would remain below its 2011-21 average of 5.0 percent but by a much-reduced margin. These policies need to be accompanied by robust policy frameworks involving fiscal, monetary, and financial sector policies. They also need to be supported by interventions by the global community. Kose and Ohnsorge (2023) discuss measures to boost human capital, labor supply, and productivity, and explores in depth policies to promote investment, services, and trade. It also explains the importance of strong macroeconomic policy frameworks and the need for support from the global community.

Investment. Policy makers in EMDEs can turn these challenges into opportunities by focusing on interventions that can boost investment. Given the enormous challenges associated with climate change, there is a well-defined need for an ambitious investment push. Climate change is expected to exacerbate extreme poverty by reducing agricultural output, increasing food prices, and worsening food and water insecurity in EMDEs, and increasing the disaster-related damages to the physical environment. As discussed above, climate-related disasters are becoming more common, and they weigh particularly heavily on vulnerable countries such as small states. They can also worsen government fiscal positions through lower tax receipts and lower productivity alongside increased spending on reconstruction and public services.

Addressing gaps between current spending on infrastructure and the level needed to meet development goals can promote investment growth. Prioritizing investment in green infrastructure projects with high economic returns, and fostering the widespread adoption of environmentally sustainable technologies, can support higher growth levels in the long-run while contributing to climate change mitigation. Sound investments aligned with climate goals in key areas—such as transport and energy, climate-smart agriculture and manufacturing, and land and water systems—can all boost long-term growth, while also enhancing resilience to future natural disasters.

Although green transitions need to be carefully managed, sustainable

investments—including by the private sector—offer significant opportunities. Besides their broader benefits, green investments may represent an important engine for job creation as they tend to be labor intensive. Addressing climate change and other development challenges also requires structural reforms that encourage the mobilization of private capital and lower barriers of access for the private sector. In many EMDEs, governance and institutional reforms are necessary to improve and unify the often fragmented regulatory and institutional environment. Reforms that improve the business climate can stimulate private investment directly and amplify the positive effects of investment, such as less informality and more job creation. All of these policy interventions also help attract FDI.

All EMDE regions need to invest more heavily in infrastructure (chapter 4). This may be to improve climate resilience, including to protect against floods, storms, and drought and dampen their impact, especially in small states (LAC, EAP) and heavily agriculture-reliant economies (SAR, SSA). It may be to improve chronically low levels of infrastructure development (SAR, SSA); accommodate rising levels of urbanization (EAP, LAC, SAR). Or it may be to support productivity in sectors that employ a large proportion of the population (for example, agriculture in SSA) or rebuild following conflict (ECA, MNA, SSA); or improve trade linkages (LAC, SAR).

The investment needed to achieve climate and development goals exceed many governments' ability to finance them. Hence, successfully leveraging private sector capital to boost investment requires a set of policies to balance the risks, costs, and returns of investment projects, and overcoming common obstacles to private investment, such as poor business conditions, insufficient project pipelines, and underdeveloped domestic capital markets.

Labor supply and human capital. Policies can aim to raise the active share of the working-age population, in particular policies to “activate” discouraged workers or groups with historically low participation rates, such as women and younger or older workers. Globally, average female labor force participation in 2011-21, at 54 percent, was three-quarters that of men, which stood at 72 percent; the gap between male and female participation was even larger in EMDEs, at 25 percentage points. Similarly, in both EMDEs and advanced economies, the average participation rate of workers aged 55 years or older was about half that of 30-45-year-old workers, and labor force participation among those aged 19-29 years was only four-fifths that of their 30-45-year-olds.

A set of reforms that gradually raises participation rates in each five-year age group from 55-59 years onwards and that raises female labor force

participation rates by their best 10-year improvement on record could increase global potential growth rates by as much as 0.2 percentage point per year on average during 2022-30. Considerably greater boosts to potential growth, in excess of 1 percentage point per year, could be achieved in regions such as SAR and MNA if they raised female labor force participation from about half of the EMDE average to the EMDE average.

Improvements to health and, especially, education could be one prong of such a set of reforms to boost labor force participation, since better-educated workers tend to be more firmly attached to labor markets. In addition, improvements in education and health outcomes on par with the best ten-year improvement on record could boost productivity and lift EMDE potential growth by an additional 0.1 percentage point per year, on average, for the remainder of this decade and more over the longer term,

Trade. Trade has flagged over the past decade. A major effort to rekindle it could yield large growth dividends over the next one. The costs added to internationally traded goods remain high: on average, they are almost equivalent to a 100 percent tariff, roughly doubling the costs of internationally traded goods relative to domestic goods (chapter 6). The bulk of the costs is accounted for by transportation and logistics, non-tariff barriers, and policy-related standards and regulations; tariffs amount to only 5 percent of average goods trade costs. Trade costs for services tend to be even higher than for goods, largely reflecting regulatory restrictions.

To reduce elevated trade costs in EMDEs, comprehensive reform packages are needed. Trade agreements can reduce trade costs and promote trade, especially if they lower non-tariff barriers as well as tariffs and generate momentum for further domestic reforms (Baldwin and Jaimovich 2010; Plummer 2007). However, even if the global environment is not conducive to progress in such agreements, countries can take action at home to rekindle trade. For example, they can streamline trade processes and customs clearance requirements; enhance domestic trade-supporting infrastructure; increase competition in domestic logistics and in retail and wholesale trade; reduce tariffs; lower the costs of compliance with standards and regulations; and reduce corruption. Empirical analysis suggests that reforms that lift an EMDE in the quartile of countries with the highest shipping and logistics costs to the quartile of those with the lowest costs could cut its trade costs in half. For maximum effect, such reforms need to be embedded in broader improvements such as in human capital and digital connectivity (Devarajan 2019; Okonjo-Iweala and Coulibaly 2019).

Trade can also play a critical role in the climate transition (Devarajan et al.

2022). It has the potential to promote the production of goods and services necessary for transitioning to low-carbon economies. In addition, trade delivers goods and services that are key to help countries recover from extreme weather events. However, evidence indicates that in some countries, entry into global value chains in manufacturing has been accompanied by greater carbon emissions, and that global value chains have contributed to greater waste and increased shipping (World Bank 2020). Shipping accounts for 7 percent of global carbon emissions and 15 percent of global emissions of sulfur and nitrogen (World Bank 2020).

A number of policies can be implemented to reduce trade costs in a climate-friendly way. For example, policies can be designed to remove the current bias in many countries' tariff schedules favoring carbon-intensive goods and eliminate restrictions on access to environmentally friendly goods and services (Brenton and Chemutai 2021; World Bank 2020). In addition, multilateral negotiations can focus not only on tariffs on environmental goods but also on nontariff measures and regulations affecting services—access to which is often vital for implementing the new technologies embodied in environmentally friendly goods.

Services. Policy interventions can also help countries unlock the potential of the services sector to drive economic growth (chapter 7). Supporting the diffusion of digital technologies in EMDEs remains central to deliver better growth outcomes. In this context, investing in ICT infrastructure, updating regulatory frameworks around data, and strengthening management capabilities and worker skills are important. Countries can promote the expansion of productive, high-skilled, offshorable services by enabling greater use of online communications and digital platforms, reducing barriers to services trade, and supporting training in relevant skills. Where education systems are weak, but reliable and widespread internet access exists, it would be possible to increase utilization of higher-quality online schooling and training. Digital technologies may expand access to finance in the poorest countries, enable more effective government service delivery, and accelerate the trend toward the automation of some routine occupations. In addition, regulatory reforms can support investment to revive low-skilled contact services, such as transportation, that employ large numbers of people.

The prospect for services-led growth will also be influenced by climate-change considerations. The services sector can play an important role in climate mitigation and adaptation. For instance, financial services can play a fundamental role in mobilizing the resources needed for necessary investments (Grippa, Schmittmann, and Suntheim 2019). Similarly,

engineering and environmental consulting services will likely be central to enabling energy-efficiency improvements (World Economic Forum 2022).

Macroeconomic policies. Robust macroeconomic policy frameworks play an important role in boosting long-term growth prospects. They can help pro-actively smooth business cycles to avoid the disruptions and distortions associated with adverse shocks. They can ensure that social protection systems are geared toward minimizing long-term damage from such shocks. In addition, they can instill confidence in sound policy making and buttress the credibility of institutions.

Robust fiscal and monetary policy frameworks are founded on transparent and rules-based approaches. Fiscal rules and medium-term budget frameworks can help countries maintain sustainable finances and accumulate reserves when the economy is doing well. These types of disciplined fiscal policy frameworks are especially critical nowadays to support growth prospects amid elevated debt levels and tight global financial conditions. In a deficit-neutral manner, they can guide government spending toward policies with long-term growth benefits, such as in health, education, or transport, or expand revenue bases to increase financing for such priority policies. Better fiscal frameworks also assist monetary policy by restraining procyclical spending that could contribute to demand pressures.

A transparent and independent central bank will be better placed to maintain price stability, thereby helping to create a macroeconomic environment that is conducive to strong growth. In particular, by establishing an environment of low and stable inflation over the medium term, and thus fostering confidence in macroeconomic stability, central banks can support private investment growth (World Bank 2022). Strong monetary policy frameworks are currently particularly important to overcome inflation and stabilize inflation expectations. Monetary policy can also play a countercyclical role through its management of interest rates and credit growth, thereby supporting investment growth when activity is weak and inflation is low but helping to contain investment when the economy is overheating.⁹

To avoid boom-bust cycles that do lasting damage to investment and potential growth, proactive financial-sector supervision and regulation can mitigate risks—especially in countries with financial markets that are developing rapidly and becoming more integrated globally. In EMDEs without a prudential authority or prudential powers, creating or empowering these

⁹ Fiscal challenges combined with weak growth prospects complicate monetary policy when inflation is high (Ha, Kose, and Ohnsorge 2022) and increase the risk of recession (Guenette, Kose, and Sugawara 2022).

institutions is a priority. In EMDEs with the appropriate institutions, flexible and well-targeted tools are needed to manage balance-sheet mismatches, foreign-currency and capital-flow-related risk, and asset-price misalignment with economic fundamentals.

Global cooperation. Since many of the challenges faced by EMDEs transcend national borders, it is essential to strengthen global cooperation to address them. The increasing frequency and severity of climate-related disasters in recent years highlight the escalating costs of climate change: the global community must therefore work together to accelerate progress toward meeting the goals of the Paris Agreement. In addition, there is a pressing need to reduce the economic, health, and social costs of climate change, many of which are borne disproportionately by vulnerable populations in EMDEs, particularly in LICs.

More pressingly, the global community can help to expand the financing and capacity-building needed to promote growth in EMDEs—including by scaling up climate-change adaptation, increasing green investments, and facilitating a green-energy transition (Bhattachariya, Kharas, and Walker 2023). The increase in investment spending needed to achieve the SDGs (relative to GDP) will be much larger for LICs than for the average EMDE. That implies that substantial additional financing from the global community and the private sector will be needed to close investment gaps. For some LICs that are already in—or at high risk of—debt distress, such financing may need to be accompanied by debt relief to allow them to steer spending toward development goals instead of debt service.

VII. Synopsis

The remainder of this paper presents a summary of each chapter of Kose and Ohnsorge (2023) that features three interconnected parts. Part I analyzes the evolution of global and regional potential growth using a new comprehensive database. Part II focuses on global and regional investment dynamics and policies to promote investment growth. Part III presents a detailed analysis of prospects for potential growth and policy measures that can lift it. It turns to the roles of services and trade as engines of long-term economic growth. Our study presents a wide menu of policy options for improving growth prospects in each chapter.

After presenting the motivation of the chapter, each summary explains the main questions, contributions to the literature, and analytical findings. After these summaries, a brief discussion of future research directions concludes.

Part I. Potential Growth: An Economy's Speed Limit

In Part I of Kose and Ohnsorge (2023), chapter 1 explores the conceptual framework and measurement of potential growth. Based on a new database introduced in this chapter, it describes the slowdown in potential growth in the past decade and its sources. Chapter 2 delves deeper into regional differences in the evolution of potential growth, describes regional prospects, and offers region-specific policy options.

Chapter 1. Potential Not Realized: An International Database of Potential Growth

In this chapter, Kilic Celik, Kose, Ohnsorge, and Ruch introduce the most comprehensive database of potential growth estimates available to date. Potential growth is critical to achieve poverty reduction; raise the resources needed to invest in solving global challenges; generate job creation and wage growth, especially in the formal sector; and achieve or sustain debt sustainability.¹⁰

Based on an extensive analysis of the earlier literature, they present three main approaches to estimating potential output growth—each of which has its advantages and disadvantages.

Production function approach. The first approach measures potential growth based on production function estimates. This makes it possible to study the contributions of what theory suggests are the fundamental drivers of growth—the growth of inputs of the factors of production (labor and capital) and technological progress—but involve assumptions that may be viewed as restrictive.

Time-series methods. The second approach obtains measures of potential growth from statistical filters that generate smoothed versions of the actual output growth data as measures of potential output. This may provide the most consistency between estimates of potential growth and output gaps, on the one hand, and indicators of domestic demand pressures, on the other. However, it provides no links between estimated potential growth and its plausible fundamental drivers.

Long-term growth expectations. A third approach uses long-term (say five years ahead) forecasts of output growth from economic analysts, which may be assumed to incorporate the forecasters' judgments about potential growth but whose

¹⁰ Ohnsorge and Yu (2022) present a broader discussion of the challenges in shifting informal activity into the formal economy. For a discussion of the challenges of low growth for debt sustainability, see Kose, Ohnsorge, and Sugawara (2022), and of government debt reduction, see Kose et al. (2022).

drivers are highly uncertain.

Chapter 1 introduces the most comprehensive international database for the nine most common measures of potential growth based on these three approaches. This database and the analysis in this chapter serve as the foundation for chapter 2 and chapter 5— which examine past and prospective potential growth globally, by country group, and by region, and policies that can be implemented to improve it. Specifically, this chapter addresses the following questions.

- How has global potential growth evolved in the past three decades?
- How have recessions and other adverse events affected potential growth?
- Through which channels have such events affected potential growth?

Contributions. Chapter 1 makes the following contributions to the literature. First, it introduces the first comprehensive database for the nine most commonly used measures of potential growth for the largest available country sample of up to 173 economies (37 advanced economies and 136 EMDEs) over 1981-2021. One of the nine measures is based on the production function approach; five are based on the application of univariate time-series filters (Hodrick-Prescott, Baxter-King, Christiano-Fitzgerald, Butterworth, and Unobserved Components filters); one applies a multivariate Kalman filter; and two are based on analysts' long-term growth forecasts.¹¹

By including a measure that builds potential growth from its fundamental drivers, the database allows later chapters to examine the role of policy initiatives such as an investment push to address climate change. Previous studies have limited themselves to a single method of measuring potential growth, such as the production function approach (OECD 2014) or multivariate filters (ADB 2016; IMF 2015). The database updates an earlier version published before the pandemic (Kilic Celik, Kose, and Ohnsorge 2020; World Bank 2018).

Second, chapter 1 documents that all measures of potential growth show a decline in global potential growth in 2011-21, relative to 2000-10, and that this decline was internationally widespread. Earlier studies documented the decline for only a subset of measures (for example, Chalaux and Guillemette

¹¹ Univariate filters are applied only to actual output; multivariate filters are applied to multiple series including actual output. Both types of filters generate smoothed output series that are considered estimates of potential output.

2019; Kilic Celik, Kose, and Ohnsorge 2020).

Third, chapter 1 describes the first systematic study of the long-term damage to potential growth from a range of short-term economic disruptions—such as recessions, banking crises, and epidemics—in a large set of countries and for a wide range of potential growth measures. Only a few earlier studies have estimated the effects of recessions on potential output growth, and they were confined to a smaller sample of countries and the production function approach (Furceri and Mourougane 2012; Mourougane 2017). This chapter broadens the earlier research by estimating the effects of recessions, banking crises, and epidemics in a large sample of advanced economies and EMDEs and for a wide range of potential growth measures.

Fourth, chapter 1 uses a set of local projection models to estimate empirically the channels through which short-term economic disruptions dampen long-term potential growth. Specifically, it estimates the effects of disruptions on the growth of the labor force, the growth of the capital stock (through investment), and the growth of TFP in a consistent framework. Previous studies have typically examined overall effects on output growth or effects through individual channels only.¹²

Findings. Chapter 1 reports several novel findings. First, an internationally widespread decline in potential growth occurred in 2011-21 relative to 2000-10 (figure 7). This is shown by all estimates of potential growth, globally and for both advanced economies and EMDEs. Global potential growth, as estimated using the production function approach, fell to 2.6 percent a year during 2011-21 from 3.5 percent a year during 2000-10; advanced-economy potential growth fell to 1.4 percent a year during 2011-21 from 2.2 percent a year during 2000-10; and EMDE potential growth fell to 5.0 percent a year during 2011-21 from 6.0 percent a year during 2000-10. The weakening of potential growth was highly synchronized across countries: during 2011-21, potential growth was below its 2000-10 average in 96 percent of advanced economies and 57 percent of EMDEs. This widespread decline

¹² The theoretical literature has modelled several mechanisms through which output disruptions may cause lasting damage: lower expected profitability of productivity-increasing research and development (Fatás 2000) or of the adoption of new, productivity-increasing technology (Anzoategui et al. 2017); lower asset prices (Caballero and Simsek 2017); restricted firm access to credit and start-up capital (Queralto 2013; Wilms, Swank and de Haan 2018); resource misallocation (Furceri et al. 2021); or human capital losses (Blanchard and Summers 1987; Lockwood 1991). Empirical estimates have shown some of these mechanism at work during past recessions (Nguyen and Qian 2014; Oulton and Sebastia-Barriel 2016). None of these studies, however, systematically estimates and compares the various channels through which short-term disruptions reduce potential growth.

reflected a multitude of factors. In terms of the production function framework, all the fundamental drivers of growth faded in 2011-21: TFP growth slowed, investment growth weakened, and labor force growth declined.

Second, recessions were associated, on average, with a decline of about 1.4 percentage points in potential growth even after five years. This refers to potential growth estimated using the production function approach; other measures yielded different estimates (with a range of 0.2-1.4 percentage points) but all were statistically significant. The effect was somewhat stronger in EMDEs—with potential growth 1.6 percentage points lower five years after the average recession—than in advanced economies, where potential growth was, on average, 1.3 percentage points lower.

Third, the medium-term impact of recessions on potential growth tended to be more severe than the effects of other adverse events. Banking crises were associated with initially larger falls in potential growth, peaking at 1.8 percentage points after two years, as a result of collapses in investment. However, these tended to be followed by rapid recoveries in investment, such that the fall in potential growth after five years was only 1.2 percentage points. Epidemics were associated with more modest, but still statistically significant, short- and medium-term declines in potential growth. These effects were more severe in EMDEs than in advanced economies, possibly reflecting the greater ability of advanced economies to limit the economic damage with fiscal and monetary policy support as well as their better developed healthcare systems.

Fourth, the chapter provides evidence that recessions affected potential growth through multiple channels. Five years after an average recession, the growth rate of investment was 3 percentage points lower than in “normal” years, and those of employment and TFP were both 0.7 percentage point lower. This contrasts with banking crises, which tended to be associated with lasting losses of TFP growth, and epidemics, which were often associated only with lasting employment losses. These possibly reflected prolonged effects on the health of the labor force and behavioral responses to epidemics.

Fifth, different estimates of potential growth are found to display different features. Estimates based on forecasts tended to be the highest and those based on univariate filtering techniques the lowest. Estimates based on filtering techniques tended to be the most volatile and to track actual growth most closely, as expected. Estimates based on the production function approach tended to be the most stable and the least correlated in the short term with actual growth.

Chapter 2. Regional Dimensions of Potential Growth: Hopes and Realities

In this chapter, Kasyanenko, Kenworthy, Kilic Celik, Ruch, Vashakmadze, and Wheeler build on chapter 1 to explore regional dimensions of potential growth. Their starting point is the finding that potential growth slowed in 2011-21 relative to the preceding decade in almost all of the World Bank’s six EMDE regions. Yet, wide differences are apparent in recent developments and prospects across the regions, and these have implications for regional policy priorities. Chapter 2 explores these regional differences by considering the following questions.

- How have potential growth and its drivers evolved in each region since the turn of the century?
- What are the prospects for regional potential growth?
- What policies would lift regional potential growth?

Contributions. Chapter 2 adds regional detail to the analysis of global potential growth in chapter 1 and chapter 5 and does so in a consistent manner across the EMDE regions. Drawing on a rich body of regional studies and using the new database introduced in chapter 1, this chapter provides the first systematic analysis of potential growth in all six EMDE regions. Other major cross-country studies of potential growth have largely focused on advanced economies (Dabla-Norris et al. 2015; IMF 2015; OECD 2014) or Asian economies (ADB 2016). Chapter 2 examines data for up to 53 EMDEs—6 in EAP, 9 in ECA, 16 in LAC, 5 in MNA, 3 in SAR, and 14 in SSA—over the past two decades (2000-2021) and considers prospects for the remainder of this decade (2022-30).

Findings. Chapter 2 documents an array of regional differences (figure 8). First, the slowdown in potential growth between 2000-10 and 2011-21 was steepest in MNA, followed by EAP, although potential growth in EAP remained higher than in all other regions except SAR. ECA and LAC experienced less pronounced slowdowns but potential growth in LAC remained the lowest among all EMDE regions. In SAR, potential growth was almost unchanged, at the highest rate among EMDE regions, while in SSA, potential growth weakened only moderately but remained one of the lowest among EMDE regions, at around half the average for SAR.

Second, EAP is expected to be the EMDE region with the sharpest decline in the growth of both aggregate and per capita potential output during 2022-30. The decline is expected to amount to about 1.6 percentage points a year, on average, and mainly reflected slower capital accumulation and TFP

growth in China as the country implements policies to shift from an investment-led to an increasingly consumption-led growth model. The second largest decline in potential growth in 2022-30 is projected for ECA, resulting in part from the fallout of the war in Ukraine but also from continued weakness in labor force growth. In SSA, potential growth is expected to decline moderately as strengthening TFP growth is expected to partially offset slowing investment and population growth. Elsewhere, potential growth is projected to be broadly unchanged in LAC and SAR and rise in MNA in 2022-30 as strengthening TFP growth offsets demographic headwinds to potential growth.

Third, persistently weak TFP growth in LAC, MNA, and SSA makes policy action to raise productivity growth especially important for these regions. There is also considerable room to boost labor force growth in MNA and SAR by encouraging female labor force participation and, in EAP and ECA, by raising participation among older workers. SAR and MNA lag especially far behind other EMDE regions in female labor-force participation (Klasen 2019). Prospects for investment growth in LAC and SSA are particularly weak and a wide range of measures is likely to be required to reignite it. Such measures are discussed in chapter 4. A climate-related investment push could catalyze a boost to potential growth in all EMDE regions.

Part II. Investment: Time for a Big Push

Part II of this volume describes the weakening of investment growth in EMDEs in the past decade, examines its causes, and considers policy options to help lift investment growth. Chapter 3 examines trends in the broad group of EMDEs and chapter 4 delves deeper into regional characteristics and identifies region-specific policy priorities to lift investment growth.

Chapter 3. The Global Investment Slowdown: Challenges and Policies

In this chapter, Stamm and Vorisek draw attention to the weakening of investment growth in EMDEs even before the onset of the COVID-19 pandemic (figure 9).¹³ By the time the pandemic began in early 2020, EMDEs had already experienced a slowdown in investment growth over the previous decade, from nearly 11 percent in 2010 to less than 4 percent in 2019. In EMDEs, excluding China, investment growth had fallen more

¹³ Throughout our study, investment refers to real gross fixed capital formation (public and private combined). Investment growth is measured as the annual percent change in real investment. In international averages, investment growth rates are weighted by average 2010-19 investment levels. For a discussion of factor reallocation across firms and sectors, see Dieppe (2020).

sharply: from about 9 percent in 2010 to just under 1 percent in 2019. The slowdown in investment growth in EMDEs during the 2010s occurred in all regions, in both commodity-importing and commodity-exporting country groups, and in a large portion of individual economies. In advanced economies, by contrast, investment growth was more sluggish but also more stable, hovering around its long-term average of 2 percent per year.

In 2020, the pandemic triggered a severe investment contraction in EMDEs, excluding China—a far deeper decline than in the 2009 global recession triggered by the global financial crisis. Even when China is included, EMDEs did not avoid an investment contraction in 2020, as they had in 2009. In advanced economies, however, because investment was buttressed by large-scale fiscal support packages and expansionary monetary policies, it shrank less in 2020 than in 2009. After a sharp rebound in 2021, investment growth in EMDEs is projected to slow back to rates that are about half the average of the previous two decades.

Slowing investment growth is a concern because it is critical to sustaining growth of potential output and per capita income. Capital accumulation raises labor productivity, the key determinant of real wages and household incomes, both through capital deepening—equipping workers with more capital—and by embodying productivity-enhancing technological advances.

Slowing investment growth has held back progress toward meeting the SDGs and fulfilling commitments made under the Paris Agreement on climate change. Meeting these goals and commitments will require filling substantial unmet infrastructure needs, including growing needs for climate-resilient infrastructure and infrastructure that reduces net greenhouse gas emissions. Given limited fiscal space in EMDEs, such scaling-up of investment will require additional financing from the private sector and the international community.

Against this backdrop, chapter 3 addresses four questions:

- How has investment growth evolved over the past decade, and how does the performance of investment during the 2020 global recession compare with previous recessions?
- What are the key factors associated with investment growth?
- What are the implications of weak investment growth for development prospects?
- Which policies can help promote investment growth?

Contributions. Chapter 3 makes several contributions to the literature on investment. It provides the first analysis of investment growth in a large sample of EMDEs since the pandemic and Russia’s invasion of Ukraine. Moreover, because FDI is a potentially critical source of technology spillovers and financing, this chapter reviews a large set of studies on the link between FDI and output or aggregate domestic investment.

In addition, the chapter examines the likely medium- and long-term consequences of the damage to investment in EMDEs from the pandemic and from Russia’s invasion of Ukraine, focusing on the effects on productivity, potential output growth, trade, and the ability to achieve the SDGs and climate-related goals. Finally, the chapter describes policies to revive investment growth, including identifying opportunities created by the pandemic.

Previous studies of investment in EMDEs have tended to be based on pre-global financial crisis data, confined to analysis of the behavior of investment around the global financial crisis, or focused on specific regions.¹⁴ ¹³ Investment weakness in advanced economies has been explored in a number of studies. This study updates and extends two previous studies of investment trends and correlates in a large sample of EMDEs (World Bank 2017a; 2019a).

Findings. Chapter 3 presents four main findings. First, the recovery of investment in EMDEs from the trough of the COVID-19 pandemic in 2020 has been slower than the recovery from the 2009 recession that followed the global financial crisis. In EMDEs excluding China, investment shrank by about 2 percentage points more in 2020 than during the 2009 global recession, despite easier financial conditions and the provision of sizeable fiscal stimulus in many large EMDEs. This partly reflects the more widespread impact of the pandemic on investment: investment shrank in nearly three-quarters of EMDEs in 2020, compared with just over 50 percent of EMDEs in 2009. The effects of the pandemic, the war in Ukraine, and monetary policy tightening by major central banks have extended the prolonged and broad-based slowdown in investment growth in EMDEs in the 2010s. The slowdown during the 2010s occurred in all regions, and in commodity-exporting and commodity-importing economies. Both private and public

¹⁴ See, for example, the analysis of the drivers of investment in Anand and Tulin (2014); Bahal, Raissi, and Tulin (2018); Caselli, Pagano, and Schivardi (2003); Cerra et al. (2017); Qureshi, Diaz-Sanchez, and Varoudakis (2015). Firm-level studies include Li, Magud, and Valencia (2015) and Magud and Sosa (2015). On investment weakness, see Banerjee, Kearns, and Lombardi (2015); IMF (2015); Leboeuf and Fay (2016); and Ollivaud, Guillemette, and Turner (2016).

investment growth were more sluggish during the 2010s than in the previous decade.

Second, the weakening of investment growth in EMDEs over the past decade reflected a wide range of headwinds. It was correlated with weaker output growth, declining net capital inflows relative to GDP, slower real private sector credit growth, and a deterioration of the terms of trade faced by energy exporters. Conversely, investment climate reform spurts tended to be associated with stronger real investment growth.

Third, after a robust rebound in 2021, investment growth is projected to average 3.5 percent per year in 2022-24 in EMDEs, about half its 2000-21 average, and 4.1 percent a year in EMDEs excluding China—one fifth below the 2000-21 average. For all EMDEs, projected investment growth through 2024 will be insufficient to return investment to its pre-pandemic (2010-19) trend. This investment outlook dampens long-term prospects for the growth of output and productivity as well as global trade, and makes meeting the development and climate goals even more challenging.

Fourth, a sustained improvement in investment growth in EMDEs will require both the use of domestic policy tools and, for some of them, international financial support— with appropriate prescriptions dependent on country circumstances. Macroeconomic policies can support investment in a number of ways, but particularly by encouraging private investment through establishing confidence in macroeconomic stability and improving business climates. Public investment can be boosted by reducing unproductive expenditures and subsidies and strengthening spending efficiency and revenue collection. To boost private investment, institutional reforms could address a range of impediments and inefficiencies, such as high business startup costs, weak property rights, inefficient labor and product market policies, weak corporate governance, costly trade regulation, and small financial sectors. Setting appropriate, predictable rules governing investment, including for public-private partnerships, is also important.

Fifth, a review of the literature since 1990 finds mixed evidence on the relationship between FDI and output growth but a mostly positive relationship between FDI and domestic investment. That said, several country characteristics, time period specifics, and features of FDI have influenced the relationship between FDI, output growth, and investment. Greenfield investment in upstream and export-intensive, non-primary sectors has tended to be more conducive to growth and aggregate investment. FDI also tended to raise growth and investment more in countries with better institutions, more skilled labor forces, greater financial development, and

trade openness.

Chapter 4. Regional Dimensions of Investment: Moving in the Right Direction?

In chapter 4, Kasyanenko, Kenworthy, Ruch, Vashakmadze, Vorisek, and Wheeler note that slowdowns in investment growth between the periods 2000-10 and 2011-21 occurred in all six EMDE regions. In several regions, the outlook for investment growth is mediocre, with 2021's strong rebound from the 2020 investment collapse having subsided. Given the importance of investment growth for potential output growth, this puts a premium on policies that can help meet the large and diverse investment needs of countries across all six EMDE regions.

Chapter 4 explores cross-regional differences in investment growth by addressing the following questions:

- How has investment growth evolved in each of the six EMDE regions?
- What are the current and prospective investment needs of each EMDE region?
- Which policies can help address investment needs in each EMDE region?

Contributions. Chapter 4 adds regional detail to the analysis of global investment growth in the previous chapter, applying a consistent framework across all EMDE regions. It draws on a rich body of regional studies that have examined the constraints on investment and possible policy solutions.

Findings. Chapter 4 identifies several regional patterns. First, investment growth slowed in the past decade in all EMDE regions, but most sharply in EAP and MNA (figure 10). In EAP, a policy shift in China aimed at reducing reliance on credit-fueled investment for economic growth and mitigating financial stability risks was largely responsible for the slowdown. In MNA, an oil price slide in 2014-16, armed conflicts, and persistent policy uncertainty in several countries contributed to the slowdown.

Second, investment growth is projected to remain well below its 2000-21 average in the near term in EAP, ECA, LAC, and SAR but to be close to its two-decade average in MNA and SSA. Consensus long-term (five-years ahead) investment growth forecasts have been downgraded repeatedly. Annual average investment growth in 2022-30 is now forecast

to be 0.3-1.8 percentage points lower, on average, than in 2011-21 in all regions except in LAC and SAR, where adverse shocks that depressed investment growth in the 2010s are not expected to recur.

Third, all regions have large needs for physical and human capital investment, whether it is to mitigate and adapt to climate change and reverse pandemic-related learning losses (all regions); improve very low levels of infrastructure development (SAR, SSA); accommodate rising levels of urbanization (EAP, LAC, SAR); support productivity growth, particularly in sectors that employ large proportions of the population (for example, agriculture in SSA); rebuild following conflicts (ECA, MNA, SSA); improve trade linkages (LAC, SAR); or prepare for future public health crises (EAP, SSA).

Fourth, a range of policies is required to lift investment. Priorities include strengthening the efficiency of public investment (especially in SAR and SSA), boosting private investment (especially in LAC and MNA), and expanding the availability of financing for investment, which is a significant need in all regions.

Part III. Policies: Recognition, Formulation, and Implementation

Part III of this volume examines policy options to improve long-term growth prospects. Using the conceptual framework provided by the production function, chapter 5 develops scenarios which allow the benefits to potential growth from a range of possible policy actions to be quantified. Chapter 6 and chapter 7 focus on two areas where there may be considerable untapped growth potential that could be unlocked with the right policies—international trade (chapter 6) and the services sector (chapter 7).

Chapter 5. Potential Growth Prospects: Risks, Rewards and Policies

In this chapter, Kilic Celik, Kose, and Ohnsorge start from the observation in chapter 1 that global potential growth in 2011-21 was significantly lower than in 2000-10. This weakening of growth was widespread globally, across country groups, and in the majority of countries.

This trend decline raises concerns about the underlying strength of economic growth over the next several years, following the recovery from the pandemic-related recession of 2020. The chapter sets out a baseline projection that shows a further slowing of global potential growth in 2022-30. This baseline projection is subject to downside risks from a number of adverse events, including climate-related disasters. In some EMDEs, especially the commodity-exporting economies in ECA and MNA, a further slowing of

potential growth could set back per capita income convergence with the advanced economies by more than a decade. The projected slowdown in potential growth is therefore a major concern for future growth and convergence prospects in EMDEs and a formidable challenge to the international community’s ability to meet its development goals.

Chapter 5 explores these issues by addressing the following questions:

- What are the prospects for potential output growth?
- What are the main risks that could lower future potential growth?
- What policy options are available to lift potential output growth?

Contributions. Chapter 5 makes three key contributions to the literature on potential growth. It presents the first comprehensive set of projections of potential output growth for the largest sample of countries for which data are available—83 countries (30 advanced economies and 53 EMDEs) that account for 95 percent of global GDP. The chapter’s estimates and projections of potential output growth are based on the production function approach presented in chapter 1.

Second, the chapter analyzes the possible effects of weather-related disasters, which are expected to become even more frequent because of climate change. It also examines the possible effects on potential growth of investment to alleviate the effects of climate change. Several studies—reviewed in Shabnam (2014), Klomp and Valckx (2014), and Botzen, Deschenes, and Sanders (2019)—have found mixed evidence for both short-term and long-term effects of natural disasters on incomes and output growth, with possibly larger and more lasting effects in low-income countries. Broadly consistent with this literature, this chapter documents small, but statistically significant, damage to growth in the short term, which dissipates quickly. The chapter goes on to estimate the impact on potential growth of investment to mitigate, or reduce the damage from, climate change, drawing on the investment needs estimated in chapter 3.

Third, chapter 5 explores, in a consistent framework, policy options to lift potential output growth. A large literature has considered the impact of different policies and other factors on growth, including human capital improvements (World Bank 2018), governance improvements (World Bank 2017b), increased international trade and global value chain integration (World Bank 2020), new technologies (World Bank 2016, 2019b), and labor market changes (World Bank 2013). In contrast to these and other earlier studies, the discussion of growth-enhancing policy options in this chapter is

based on the framework provided by the production function approach.¹⁵

Findings. Chapter 5 presents several findings. First, the slowdown in potential growth in the past two decades, described in chapter 1, is projected to extend into the remainder of this decade. Trends in the fundamental drivers of growth suggest that global potential output growth will slow further, by 0.4 percentage point a year on average, to 2.2 percent a year during 2022-30 (figure 11). About half of this slowdown is due to demographic factors from an aging population, including slowing growth in the working-age population and declining labor force participation.

EMDE potential growth is projected to weaken considerably more, by about 1.0 percentage point a year, to 4.0 percent a year during 2022-30. In advanced economies, potential growth is expected to slow by 0.2 percentage point a year, to 1.2 percent a year, on average, during 2022-30. The slowdown will be internationally widespread: Economies accounting for nearly 80 percent of global GDP, including most EMDEs, are projected to experience a slowdown in potential growth between 2011-21 and 2022-30. Global potential growth over the remainder of this decade could be even slower than projected in this baseline scenario by another 0.2-0.9 percentage point a year, if investment growth, improvements in health and education outcomes, or developments in labor markets disappoint or if unforeseen adverse events materialize.

Second, climate change is likely to have a sizable adverse effect on potential output growth over the remainder of this decade, given that the frequency and intensity of weather-related disasters is expected to increase. Over the past two decades, the average natural disaster has lowered potential growth in the affected country by 0.1 percentage point in the year of the disaster. Over the medium term, however, the damage has varied widely depending on the speed and magnitude of reconstruction efforts. For example, three years after a climate disaster, TFP growth was anywhere between nil and 10 percent lower than in countries and years without disasters (Dieppe, Kilic Celik, and Okou 2020). The average small state has suffered losses and damages from climate-related disasters of about 5 percent of GDP per year, on average (World Bank 2023).

However, increased infrastructure investment to alleviate the effects of climate

¹⁵ Several studies have investigated the link between the growth of output or productivity and structural reforms, focusing on the near-term benefits (Prati, Onorato, and Papageorgiou 2013) or productivity effects (Adler et al. 2017; Dabla-Norris, Ho, and Kyobe 2016). In some of these studies, the sample has consisted mostly of advanced economies (Banerji et al. 2017; de Haan and Wiese 2022; IMF 2015, 2016).

change could more than offset this damage. For example, the literature review of chapter 3 summarizes estimates of climate-related investment needs averaging 2.3 percentage points of GDP per year; for EMDEs, this is equivalent to about one-third of the investment boost that would occur if they repeated their best 10-year investment growth performance.¹⁶ Such additional investment over the remainder of this decade could raise global potential growth by 0.1 percentage point and EMDE potential growth by 0.3 percentage point a year.

Third, a number of policies could help reverse the projected further weakening of global potential growth and return it to its 2011-21 average rate. Reforms associated with higher physical capital investment, enhanced human capital, and faster labor-supply growth could raise potential growth by 0.7 percentage point a year in 2022-30, both globally and in EMDEs. This would offset the 0.4 percentage point decline in global potential growth between 2011-21 and 2022-30 projected in the baseline scenario and most of the 1.0 percentage point slowdown projected for EMDEs. The policy options considered here could raise potential growth even more in EAP, ECA, and SSA, where large investment needs remain, or where countries have strong track records of boosting investment.

Chapter 6. Trade as an Engine of Growth: Sputtering But Fixable

In chapter 6, Ohnsorge and Quaglietti note that the growth of international trade, powered by trade liberalization and falling transport costs, has historically been an important engine of output and productivity growth. In recent decades, it has helped about a billion people to escape poverty and many EMDEs to integrate into the world economy. Empirical studies indicate that a 1 percentage point of GDP increase in an economy's trade openness has tended to lift per capita income by 0.2 percent (World Bank 2020).

A large part of the gains from trade in recent decades can be attributed to the expansion of global value chains (World Bank 2020). Participation in global value chains generates efficiency gains and supports the transfer of knowledge, capital, and other inputs across countries—which boosts productivity. Global value chain integration has also been associated with reduced vulnerability of economic activity to domestic shocks, although it has come with increased sensitivity to external shocks (Constantinescu, Mattoo, and Ruta 2020; Espitia et al. 2021).

In the past decade and a half, global trade growth has slowed as global value

¹⁶ Climate-related investment needs globally have also been put at 2-3 percent of GDP by Stern et al. (2023).

chains have matured, weaker investment growth has weighed on goods trade, political support for trade liberalization has waned, and trade tensions have emerged between major economies (World Bank 2015, 2017a). As a result, instead of growing twice as fast as global output growth, as it did during 1970-2008, the growth of global trade in goods and services in 2011-19 was less than one-half as fast as global output growth.

During the COVID-19 pandemic, global trade was hit particularly hard, falling by nearly 16 percent in the second quarter of 2020. The subsequent rebound was swift, however, especially for goods trade, and much faster than after the 2007-09 global financial crisis. That said, since 2021, global trade growth has slowed again, amid COVID-19 outbreaks, supply chain strains, and Russia's invasion of Ukraine in February 2022.

Unless there is a major policy push, trade growth is likely to weaken further in the remainder of the current decade, not only because of the prospect of slower output growth, but also because some of the key structural factors that supported rapid trade expansion in the past seem, at least for now, to have run their course. Supply chains have been remarkably resilient given the magnitude of recent shocks. However, the COVID-19 pandemic and Russia's invasion of Ukraine could accelerate the erosion of globally integrated supply chains that was already underway—including by leading to further in-sourcing and regionalization of production networks and by increasing digitalization. Multinational corporations operating in EMDEs have already increased the use of digital technologies and diversified suppliers and production sites to increase their resilience to supply-chain shocks (Saurav et al. 2020). As multinationals seek to diversify, EMDEs with the prerequisite quality of business environments, institutions, and governance may have new opportunities to integrate into global supply chains.

As discussed in chapter 1, potential output growth is expected to slow in many EMDEs in the remainder of the current decade amid unfavorable demographics and weak investment and TFP growth. One way in which policy makers in EMDEs can boost the long-term growth of output and productivity is by promoting trade integration through measures to reduce trade costs.

Chapter 6 examines the following questions:

- What is the link between trade growth and long-term output growth?
- What are the prospects for trade growth in the coming decade?
- How large are trade costs?

- What are the correlates of trade costs?
- Which policies can help to reduce trade costs?

Contributions. Chapter 6 contributes to the literature in several ways. First, the chapter expands on an earlier study with a new, comprehensive review of the theoretical and empirical literature on the links between trade and output growth (World Bank 2021). Second, it shows the evolution of trade in goods and services through global recessions, including the pandemic-induced global recession of 2020.

Third, the chapter revisits estimates of trade costs and their correlates in some earlier studies (Arvis et al. 2016; Novy 2013; World Bank 2021). The chapter uses estimates of the costs of goods trade for up to 180 countries (29 advanced economies and 151 EMDEs) from the World Bank/UNESCAP database for 1995-2019. The determinants of the costs of goods trade, which accounts for about 75 percent of world and EMDE trade in goods and services, are estimated econometrically. The chapter also quantifies the costs of one type of services trade—logistics and shipping services—relative to the costs of goods trade. In addition, the chapter goes beyond previous research in assessing the role of trade policy—tariffs, participation in trade agreements, and non-tariff barriers—in trade costs. Fourth, the chapter discusses policy options for lowering trade costs. In particular, it offers scenarios that indicate the potential effects of various policy measures on trade costs.

Findings. Chapter 6 offers several findings. First, the theoretical literature indicates that international trade boosts long-term growth of output and productivity by promoting a more efficient allocation of resources, technological spillovers, and human capital accumulation. The empirical literature supports the theory by finding statistically significant positive relationships between trade openness and output growth, although they may be conditional on the presence of sound institutions and a supportive business environment in exporting countries. Overwhelmingly, empirical studies find that international trade enhances productivity growth.

Second, the COVID-19-induced global recession of 2020 triggered a collapse of global trade in goods and services that was followed by a rapid rebound (figure 12). Before the end of 2020, global goods trade had recovered to pre-pandemic levels, and, by September 2021, global services trade had reached pre-pandemic levels, even though travel and tourism services trade was still 40 percent lower than before the pandemic. The decline in services trade was considerably more pronounced and its recovery more subdued than

in past global recessions, whereas movements in goods trade were broadly comparable to those in past global recessions.

Third, global trade growth is likely to weaken by another 0.4 percentage point per year in the remainder of the current decade due to slower global output growth as well as to the further waning of structural factors that supported rapid trade expansion in the past, such as the expansion of global value chains. The disruptions caused by the pandemic and the war in Ukraine may also continue to dampen trade growth over the medium term. A major policy effort to reduce trade costs could help reverse the trade slowdown.

Fourth, trade costs for goods are high: on average, they are almost equivalent to a 100 percent tariff—making internationally traded goods cost roughly twice as much as domestic goods. Tariffs amount to only one-twentieth of average trade costs; the bulk of trade costs are incurred by transportation and logistics, non-tariff barriers and policy-related standards and regulations. Despite a one-third decline since 1995, trade costs in EMDEs remain about one-half higher than in advanced economies. About two-fifths of the explained difference in trade costs between EMDEs and advanced economies can be explained by higher shipping and logistics costs, and a further two-fifths by trade policy (including trade policy uncertainty). Services trade costs tend to be considerably higher than goods trade costs; they can, to a large extent, be attributed to regulatory restrictions.¹⁷

Fifth, to reduce elevated trade costs in EMDEs, comprehensive reform packages are needed, including to streamline trade processes and customs clearance requirements; enhance domestic trade-supporting infrastructure; increase competition in domestic logistics and in retail and wholesale trade; lower tariffs; lower the costs of compliance with standards and regulations; and reduce corruption. Trade agreements can also reduce trade costs and promote trade, especially if they lower nontariff barriers as well as tariffs. The chapter's empirical analysis suggests that an EMDE in the 25 percent of EMDEs with the highest shipping and logistics costs could cut its trade costs in half if it improved these conditions to match the 25 percent of EMDEs with the lowest costs of shipping and logistics.

Chapter 7. Services-Led Growth: Better Prospects after the Pandemic?

In chapter 7, Nayyar and Davies document that services, generally the largest sector of economic activity, has also been the main source of growth over

¹⁷ That said, there is some evidence that professional services now have trade costs comparable to those in manufacturing industries (Gervais and Jensen 2019).

the past three decades. In 2019, services accounted for 63 percent of global output and 57 percent of global employment. Between 1995 and 2019, services accounted for two-thirds of global output growth and almost three-quarters of global employment growth. Although the services sector accounts for a smaller part of economic activity in EMDEs than in advanced economies, the difference is not large: even in EMDEs, services accounted for 60 percent of output and 52 percent of employment in 2019.

The services sector is diverse. It includes high-skilled offshorable services (such as information and communications technologies, finance, and professional services) that have been internationally traded much like goods since the ICT revolution in the 1990s. It also includes low-skilled contact services (transportation, hospitality, retail, personal services, arts, entertainment and recreation, and administrative and support) that have typically required physical proximity between providers and consumers. Many services in both of these categories provide important inputs for non-service sector activity. For example, transportation and logistics services are essential for international trade in agricultural commodities and manufactured goods, while ICT services are central to increasingly data-intensive production processes, including manufacturing.¹⁸

Chapter 7 shows the uneven blows that the pandemic dealt to different service activities. Low-skilled contact services, such as transportation and hospitality, were hit particularly hard by social distancing regulations and precautions against the spread of the virus. But high-skilled offshorable services, such as ICT and professional services, were much less affected because they were amenable to home-based work. The resulting productivity benefits can boost economic growth more broadly through the important linkages between services and other sectors of the economy.

To explore these issues, chapter 7 addresses the following questions:

- How has the services sector shaped global economic growth over the past three decades?
- How has the services sector been affected by the pandemic?
- How can digitalization enhance the services sector's growth as countries recover from the pandemic?
- Which policies can help harness the services sector's growth

¹⁸ Social services (education and healthcare), which are largely publicly provided, are not a focus of chapter 7.

potential?

Contributions. Chapter 7 makes several contributions to the literature. First, it establishes a set of stylized facts that describe the role of the services sector in the global economy over the past three decades. These stylized facts complement a growing literature on structural change and productivity growth in EMDEs that highlights the shifting contributions of the manufacturing and services sectors.¹⁹ In particular, a set of decompositions by services subsector compares the contributions of growth in different categories of demand—private domestic demand, exports, and government consumption—and, on the supply side, the contributions of growth in factor inputs and TFP growth.

Second, the chapter analyzes how the pandemic has affected prospects for services-led growth by tracing patterns of recovery and assessing growth opportunities linked to the acceleration in digitalization. This builds on recent studies that examine the effects of the pandemic on growth and income distribution (Apedo-Amah et al. 2020; Chetty et al. 2020; Narayan et al. 2022).

Third, the chapter discusses policies to leverage the services sector’s potential growth after the pandemic. This adds to the policy discussion in Nayyar, Hallward-Driemeier, and Davies (2021a,b) by focusing on what has changed since the pandemic. Policies discussed include reducing regulatory barriers and improving skill development, not only for the high-skilled offshorable services that have best withstood the pandemic but also for the low-skilled services such as transportation that have important linkages with other sectors.

Findings. Chapter 7 presents several novel findings. First, the services sector has led economic growth over the past three decades, accounting for more than half of the growth in GDP and employment in both advanced economies and EMDEs between 1995 and 2018-19 (figure 13). However, there are differences between advanced economies and EMDEs in the composition of services sector growth. While the contribution of low-skilled contact services to growth has been similar in EMDEs and advanced economies, that of high-skilled offshorable services was about twice as high in advanced economies as in EMDEs. High-skilled offshorable services accounted for about one-third of GDP growth in advanced economies, but only one-sixth of GDP growth in

¹⁹ On the contributions of manufacturing and services sectors to economic growth, see, for example, Fan, Peters, and Zilibotti (2021); Kinfemichael and Morshed (2019); McMillan and Rodrik (2011); Nayyar, Hallward-Driemeier, and Davies (2021a, 2021b); Nayyar et al. (2021); and Rodrik (2016).

EMDEs, and for about one-half of employment growth in advanced economies compared with one-ninth in EMDEs. The difference will matter for productivity growth going forward, because low-skilled contact services have been associated with slower export growth than domestic demand growth and with slower TFP growth than growth of labor and capital inputs.

Second, although overall services activity collapsed during the pandemic, the impact on low-skilled contact services reliant on face-to-face interactions with consumers was far more severe than on high-skilled offshorable services, which are more amenable to remote communication through digital delivery—such as ICT and professional services. The latter were among the activities least adversely impacted by the pandemic; indeed, in some cases, especially ICT services, output and investment expanded.

Third, the increased digitalization that occurred during the pandemic augurs well for growth prospects in the services sector. Among high-skilled offshorable services, digitally deliverable ICT and professional-services exports by EMDEs have increased sharply, to more than 50 percent of their total services exports in 2021 from 40 percent in 2019. Even where physical proximity remains important, digitalization has expanded opportunities, including for scale economies. For example, e-commerce platforms have enabled retailers and restaurants to reach beyond their local neighborhoods, while ICT and management practices have enabled the standardization of production over many establishments. Greater reliance on services sectors for growth may also help mitigate the adverse impacts of climate change on agricultural production.

Fourth, policy interventions can help countries leverage the potential of the services sector to drive economic growth as they continue to recover from the pandemic. Policy support for the diffusion of digital technologies in EMDEs remains central, given that the share of firms using email to communicate with clients was less than one-third as recently as 2018. Investing in ICT infrastructure, updating regulatory frameworks around data, and strengthening management capabilities and worker skills all matter. Countries can target the expansion of productive high-skilled offshorable services by reducing barriers to market access and promoting the improvement of skills. They can also support investments and regulatory reforms to revive low-skilled contact services, such as transportation, that employ large numbers of people.

VIII. Future research directions

Our study suggests several directions for future research. These directions

range from improvements in estimates of potential growth to more granular estimates of the effects of climate change and various structural policy measures.

VIII.1 Improvements in measurement

Estimates of potential growth could be improved in a number of ways. In particular, several refinements would be useful in applications of the production function approach (chapter 1):

- Especially for countries that rely heavily on natural resources, the estimation of production function-based potential growth could take into account natural resources as a factor of production.
- TFP growth estimates should take into account the role of new drivers of productivity, such as digital technologies, foreign direct investment, or global value chain integration.
- Application of the production function approach could be improved by estimating a broader measure of human capital, beyond the enrolment and completion metrics and life expectancy used in the analysis in this study. The World Bank's *Human Capital Index* offers one such measure, but currently only covers a few, recent years (World Bank 2020).
- Other estimates of potential growth could also be refined. For example, potential growth estimates based on multivariate filters could be extended to calculate output gaps and their relationship with inflation and other measures of demand pressures. External drivers of business cycles—such as global tourism for tourism-reliant countries or global liquidity for financial centers—could also be included.
- Data improvements could also benefit the analysis of the role of services in the global economy (chapter 7). Addressing several methodological challenges in measuring services outputs, inputs, and trade flows could improve estimates of the contribution of the services sector to economic growth.
- International trade in services has particularly poor data availability (chapter 6). Measures of services trade costs remain scant, which makes it difficult to assess and quantify their determinants. Since trade costs in services are largely associated with regulatory barriers, further analysis of the implications for trade costs of variations in regulations across sectors, countries, and regions is warranted. This

would allow a more in-depth analysis of patterns and correlates of services trade costs.

VIII.2 Effects of climate change

Chapter 5 outlines one approach to quantify the effects of various factors related to climate change on long-term output growth. Such estimates could be refined to identify how country characteristics, circumstances, and policy responses are related to the extent of damage to growth from extreme weather events. In addition, the channels through which climate change affects economic growth could be explored in greater detail. This is particularly important for understanding longstanding growth weakness in small states (World Bank 2023).

Spillovers from natural disasters in one country to its trading partners could be examined. For example, natural disasters may cause the largest domestic damage in small island states, but international spillovers may be limited in these cases, whereas disasters that disrupt production of an internationally traded commodity in a major producer could have substantial global repercussions.

The transportation associated with international trade is one of the largest contributors to global greenhouse gas emissions (chapter 6). Depending on their impact on global patterns of trade, reforms to reduce trade costs may therefore increase or reduce emissions. Further research could aim to better understand the climate-related effects of reducing trade costs.

VIII.3 Effects of other structural policies

Several structural policy changes not considered in our study could be explored, drawing on longer-term data. In the 1970s, 1980s, and 1990s there were major structural changes and widespread reforms in labor markets, product markets, financial sectors, and fiscal and monetary policy frameworks. These could not be explored with the large cross-country sample used in this study because it extends only as far back as 2000. However, at least for a subset of countries, data may be available that go further back in time. This could facilitate the analysis of the longer-term effects of the structural changes that occurred in the 1970s and 1980s. A longer time period may also allow a better assessment of the “cleansing” effects of adverse shocks in raising overall productivity.

Many EMDEs host large state-owned and private enterprises in which activity is excessively concentrated, with associated market power. Reforms of state-owned enterprises and measures to break up, where appropriate, or otherwise

reform the regulation of monopolies could trigger higher productivity growth because capital and labor would be reallocated toward more productive uses. A better understanding of the quantitative impact on potential growth in EMDEs as well as the identification of conducive preconditions and complementary reforms would be helpful.

Many EMDEs have weak governance and business climates. An assessment of the effects of improvements in various dimensions of governance and business climates on potential growth, including on firm productivity and household employment decisions, would be helpful.

The pandemic has triggered a sharp increase in digitalization. Several countries have launched policy initiatives to encourage further digitalization. Future research could analyze the effects of such digitalization efforts on trade and innovation, and how digitalization has changed growth patterns in the services sector.

Finally, the pandemic has highlighted the challenges that can be presented by global value chain disruptions. Through complex global value chains, with multiple border crossings, trade costs and disruptions can snowball. Future research could investigate which policy measures can be most effective in reducing trade costs in the context of global value chains.

ANNEX A Tables

TABLE A.1 Actual GDP growth (percent)

Country group	Period	Growth	Country group	Period	Growth	Country group	Period	Growth
EMDEs	2000-10	6.0	EMDEs	2000-09	5.9	EMDEs	2000-08	6.3
	2011-21	4.4		2010-19	5.1		2011-19	4.9
	2022-24	3.6		2022-24	3.6		2022-24	3.6
MICs	2000-10	6.3	MICs	2000-09	6.1	MICs	2000-08	6.5
	2011-21	4.6		2010-19	5.3		2011-19	5.0
	2022-24	3.6		2022-24	3.6		2022-24	3.6
LICs	2000-10	6.0	LICs	2000-09	5.9	LICs	2000-08	6.0
	2011-21	4.8		2010-19	5.4		2011-19	5.2
	2022-24	4.9		2022-24	4.9		2022-24	4.9

Source: World Bank.

TABLE A.2 Per capita growth (percent)

Country group	Period	Growth	Country group	Period	Growth	Country group	Period	Growth
EMDEs	2000-10	4.6	EMDEs	2000-09	4.4	EMDEs	2000-08	4.8
	2011-21	3.2		2010-19	3.5		2011-19	3.5
	2022-24	2.7		2022-24	2.7		2022-24	2.7
MICs	2000-10	4.9	MICs	2000-09	4.7	MICs	2000-08	5.1
	2011-21	3.5		2010-19	4.1		2011-19	3.8
	2022-24	2.8		2022-24	2.8		2022-24	2.8
LICs	2000-10	2.9	LICs	2000-09	2.8	LICs	2000-08	2.9
	2011-21	1.7		2010-19	2.3		2011-19	2.1
	2022-24	2.1		2022-24	2.1		2022-24	2.1

Source: World Bank.

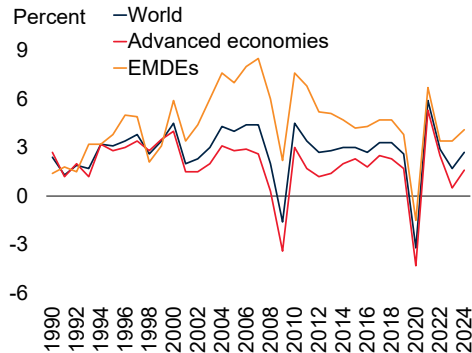
TABLE A.3 Potential GDP growth (percent)

Country group	Period	Growth	Country group	Period	Growth	Country group	Period	Growth
World	2000-10	3.5	Advanced economies	2000-10	2.2	EMDEs	2000-10	6.0
	2011-21	2.6		2011-21	1.4		2011-21	5.0
	2022-30	2.2		2022-24	1.2		2022-24	4.0

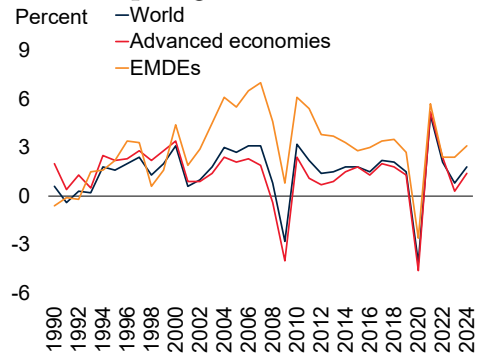
Source: World Bank.

Figure 1. Growth

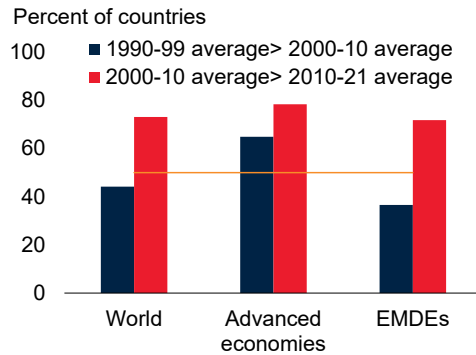
A. Growth



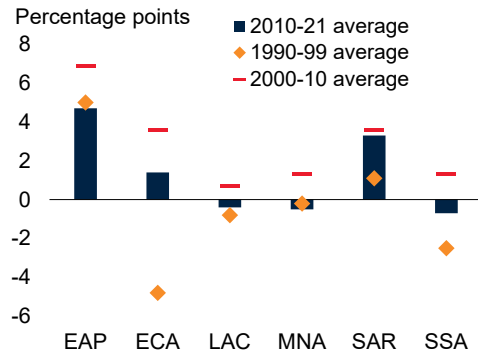
B. Per capita growth



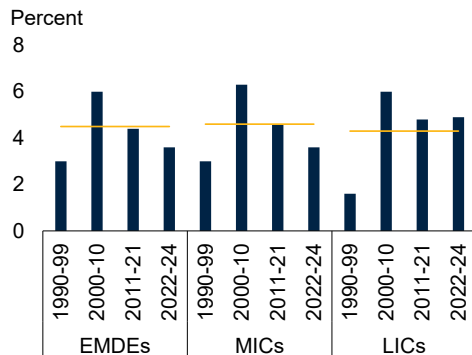
C. Share of countries with slower growth than in the previous decade



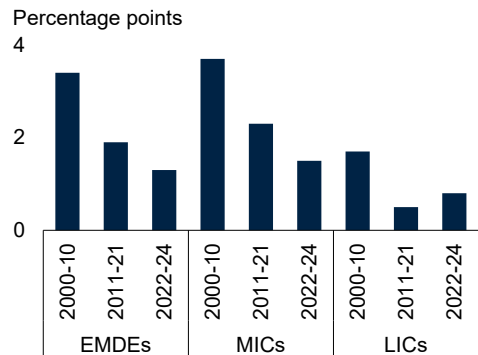
D. Annual average per capita income growth relative to advanced economies



E. Growth



F. Per capita growth relative to advanced economies

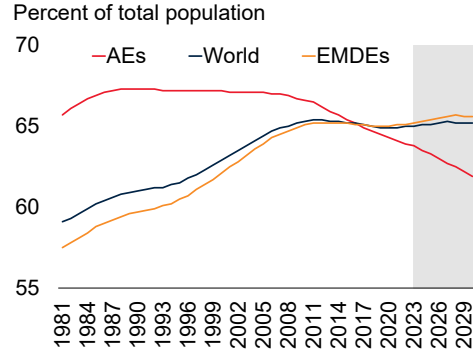


Source: World Bank. *Note:* EMDEs = emerging market and developing economies. A.B. Projections for 2023-24. GDP-weighted averages (at 2010-19 average exchange rates and prices). C. Yellow horizontal line indicates 50 percent. D. EAP = East Asia and the Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. E.F. MICs = Middle-income countries; LICs = low-income countries. GDP-weighted averages (at 2010-19 average exchange rates and prices).

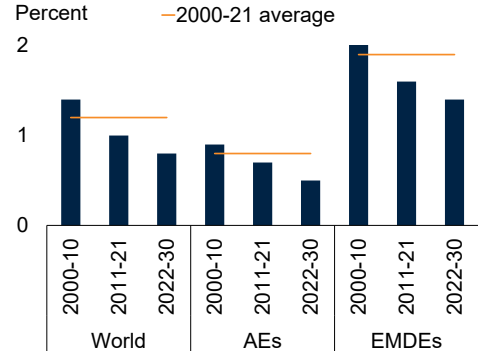
Unbalanced sample of up to 105 MICs and 26 LICs. Projections for 2022-24 from the World Bank's January 2023 *Global Economic Prospects* report.

Figure 2. Drivers of output growth

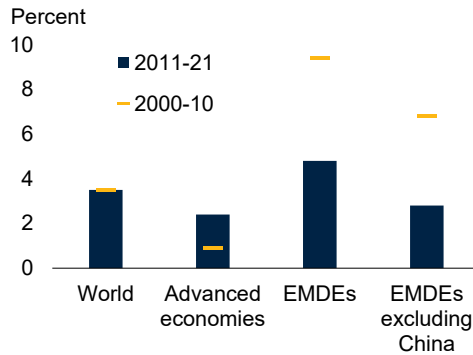
A. Working-age population



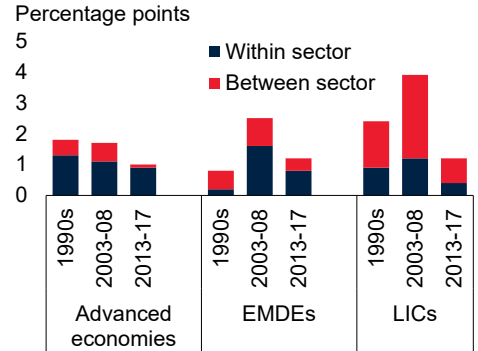
B. TFP growth



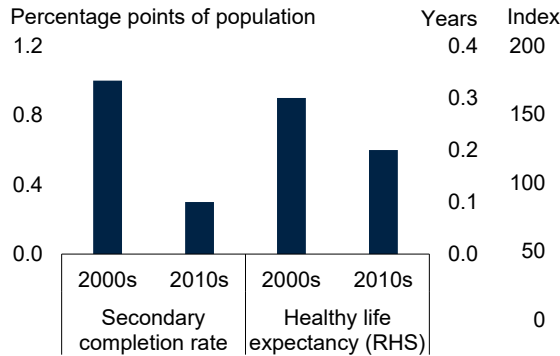
C. Investment growth



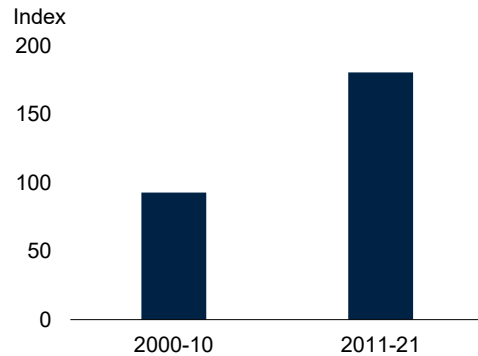
D. Contributions to labor productivity growth



E. Improvement in human capital indicators



F. Global policy uncertainty



Sources: Baker, Bloom, and Davies (2016); Dieppe and Matsuoka (2019); United Nations Population Statistics; World Health Organization, Global Health Outlook; World Bank.

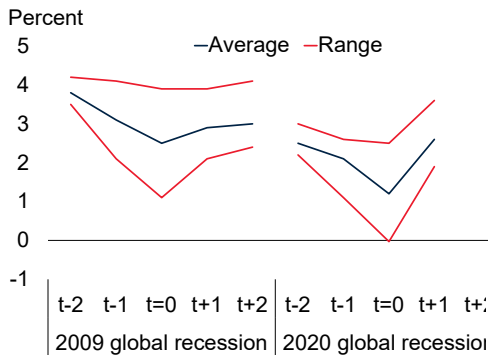
Note: AEs = advanced economies; EMDEs = emerging market and developing economies; LICs = low-income countries.

A. Population weighted averages. The working-age population is defined as people aged 15-64 years. B. GDP-weighted arithmetic average of total factor productivity growth. Includes 53 EMDEs and 29 advanced economies. B.-E. Arithmetic annual averages. C. GDP-weighted averages for the period indicated. D. Based on samples

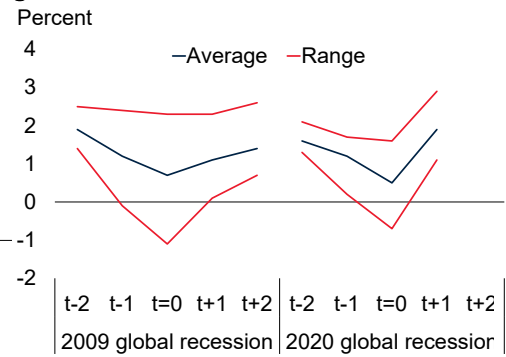
of 94 countries during 1995-1999 and 103 countries during 2003-2017. Median of country-specific productivity contributions. Within-sector growth shows the contribution of initial real value added-weighted productivity growth and between-sector growth shows the contribution from changes in the employment share. E. For healthy life expectancy (HALE) at birth, annual average change in population-weighted average for 179 countries between 2000 and 2010 and between 2011 and 2019. For lower secondary school completion rate (in percent of relevant age group), annual average change in world aggregate between 2000 and 2010 and between 2010 and 2019. F. Period averages. Global policy uncertainty is a GDP-weighted average of national Economic Policy Uncertainty indices for 21 countries: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, India, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, South Korea, Spain, Sweden, the United Kingdom, and the United States (Baker, Bloom, and Davies 2016).

Figure 3. Damage to potential growth of recessions

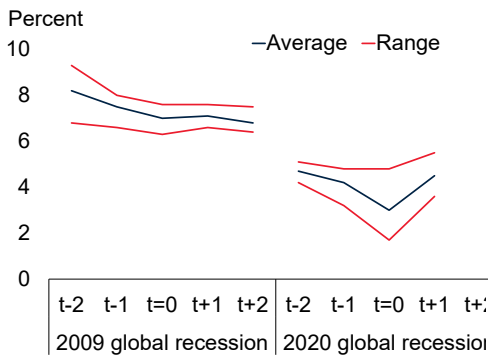
A. World: Potential growth



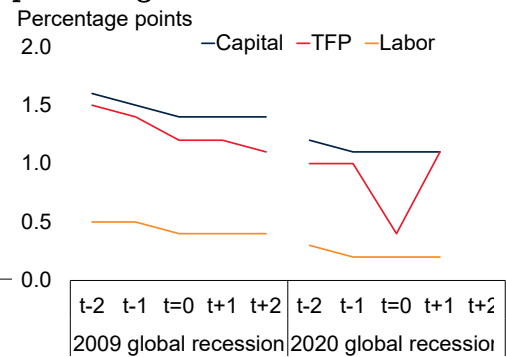
B. Advanced economies: Potential growth



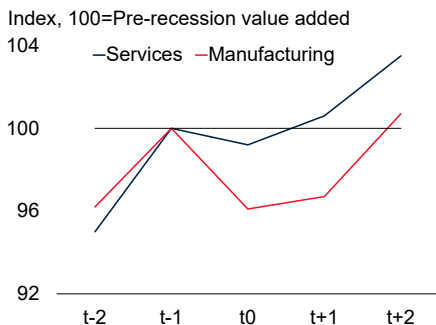
C. EMDEs: Potential growth



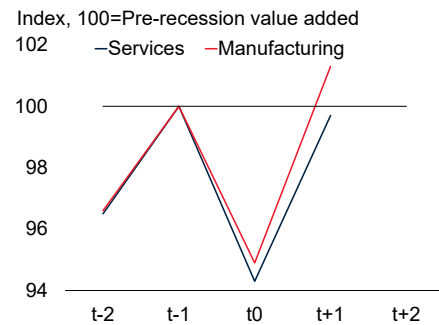
D. World: Contributions to potential growth



E. National recessions before 2020



F. National recession in 2020



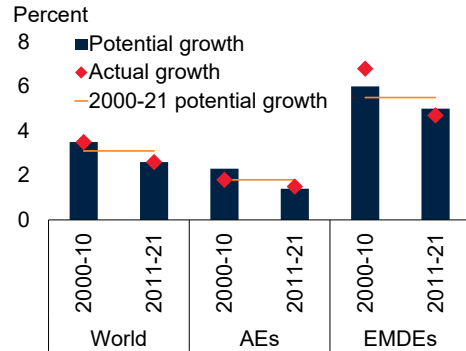
Source: World Bank.

Note: EMDEs = emerging market and developing economies. In each panel, the horizontal axis shows years, with t representing the recession year.

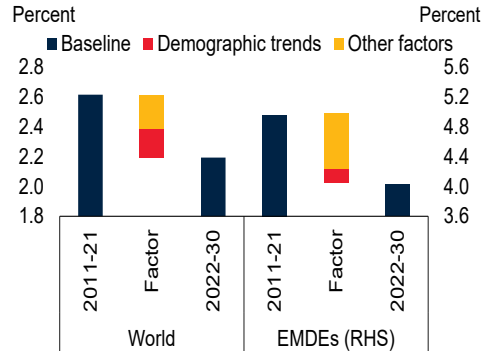
A.-C. “Average” is an unweighted average of seven potential growth measures (excluding forecasts). “Range” reflects the maximum and minimum. Figures show potential growth around t = 2009 and t = 2020. D. Figures show the contributions of growth in capital, TFP, and labor to potential growth around t = 2009 and t = 2020. E.F. Charts show the unweighted average level of real value added in services (blue) and manufacturing (red) in the years around the recession year t, indexed to 100 for the year preceding the recession.

Figure 4. Potential growth

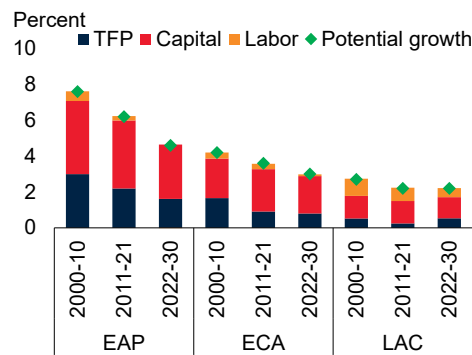
A. Potential growth



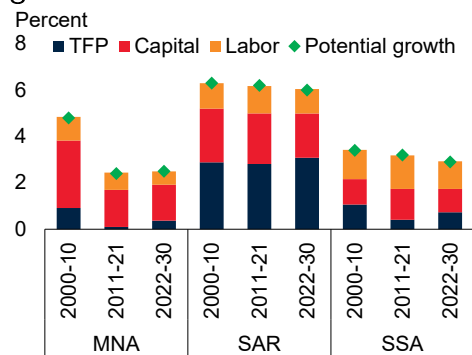
B. Potential growth



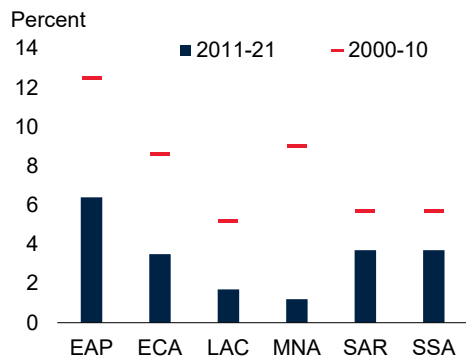
C. Contributions to potential growth



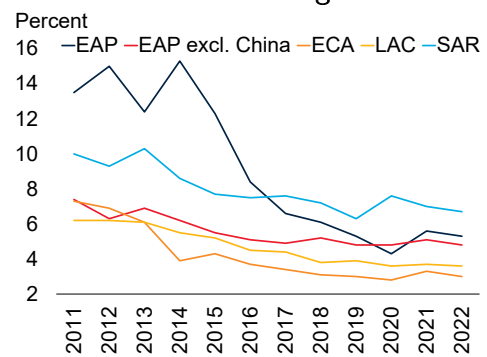
D. Contributions to potential growth



E. Investment growth, by region



F. Five-year ahead consensus forecasts of investment growth



Sources: Consensus Economics; Penn World Tables; World Bank.

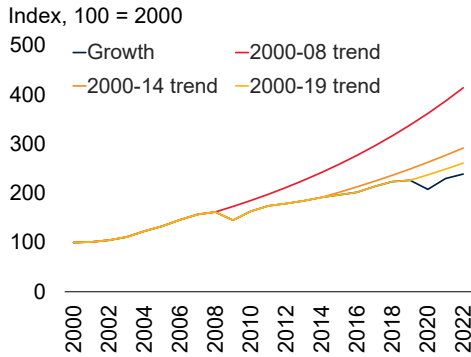
Note: AEs = advanced economies; EMDEs = emerging market and developing economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.

A.-E. Arithmetic annual averages. A.B. Based on production function approach. GDP-weighted averages for a sample of 29 advanced economies and 53 EMDEs. C.D. Based on production function approach. Sample includes 4 countries in EAP, 9 in ECA, 15 in LAC, 7 in MNA, 2 in SAR, and 13 in SSA. Data for 2022-30 are

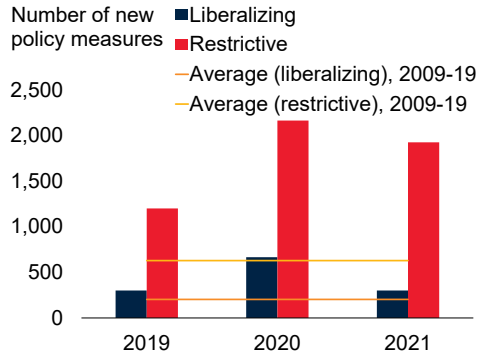
forecasts. E. Weighted averages by real annual fixed investment in constant U.S. dollars. Sample includes 8 EAP, 12 ECA, 19 LAC, 9 MNA, 3 SAR, and 19 SSA economies. F. Includes data for six economies in EAP (China, Indonesia, Malaysia, Philippines, Thailand, Vietnam), seven economies in ECA (Bulgaria, Croatia, Hungary, Poland, Romania, Russia, Ukraine), six economies in LAC (Argentina, Brazil, Chile, Colombia, Mexico, Peru) and one economy in SAR (India). Single-year missing data are interpolated.

Figure 5. Global trade and investment

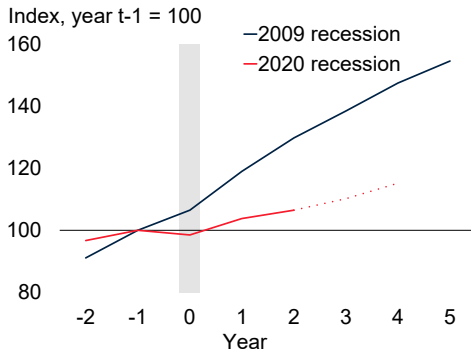
A. Global trade



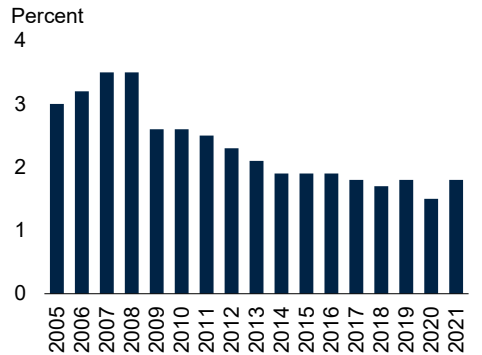
B. Policy interventions affecting trade



C. EMDE investment



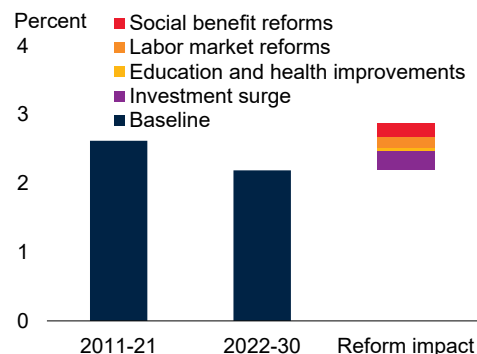
D. Foreign direct investment in EMDEs



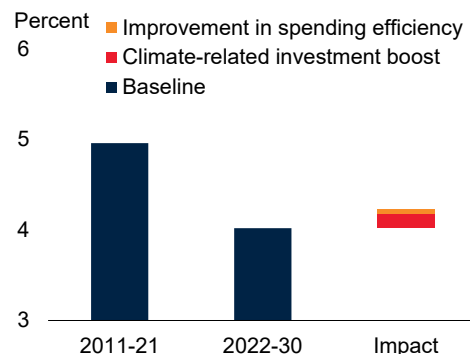
Sources: Global Trade Alert (database); Haver Analytics; UNCTAD; World Bank. A. Trade defined as exports and imports of goods and nonfactor services. B. Data exclude late reports for the respective reporting years (the cut-off date is December 31 of each year). C. Investment-weighted average (at 2010-19 average exchange rates and prices), indexed to 100 in the year before the global recession. “0” indicates the year of the global recession (2009 or 2020). D. Last observation in 2021.

Figure 6. Policy options

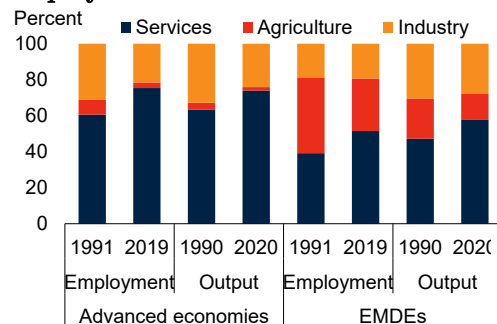
A. Global potential growth under reform scenarios



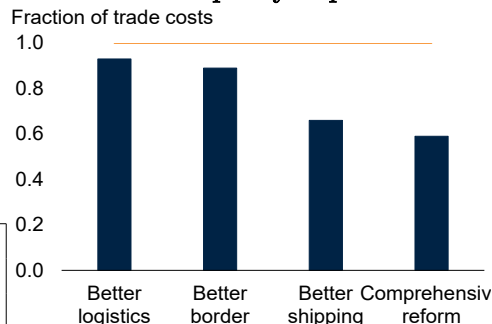
B. EMDEs potential growth in climate-related infrastructure investment scenarios



C. Composition of output and employment



D. Reduction in overall trade costs associated with policy improvements



Sources: Nayar, Hallward-Driemeier, and Davies (2021); Penn World Tables; World Bank.

Note: AEs = advanced economies; EMDEs = emerging market and developing economies. EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. GDP-weighted averages.

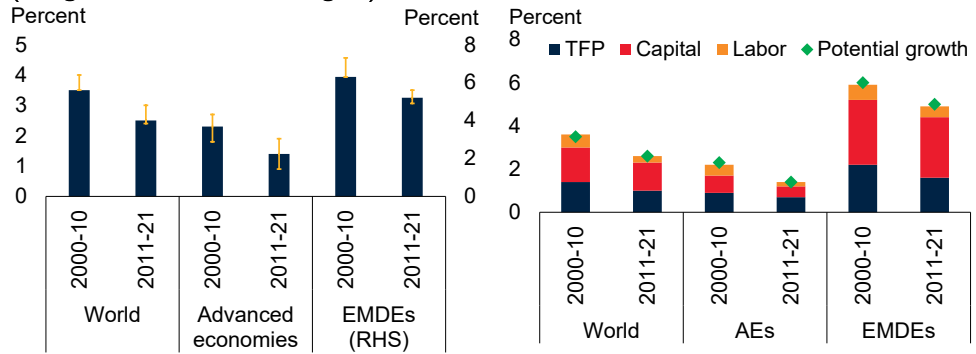
A.-C. Arithmetic annual averages.

A. Scenarios assume a repeat, in each country, of each country's best 10-year improvement. B. Climate-related investment boost assumes an increase in average annual investment over the course of 2022-30 of 2.3 percentage points of GDP in line with the average of 13 countries covered in World Bank Country Climate and Development Reports (Argentina, China, Egypt, Ghana, Iraq, Jordan, Kazakhstan, Morocco, Peru, Philippines, South Africa, Türkiye, and Vietnam). The regional differences are in line with Rozenberg and Fay (2019). Improvement in spending efficiency assumes that each EMDE moves up two quartiles in the distribution of spending efficiency. C. Sample for employment includes 35 advanced economies and 143 EMDEs, with data until 2019. Sample for output includes 31 advanced economies and 140 EMDEs, with data until 2020. D. Bars show the fraction of goods trade costs that would remain after policy improvements. Policy improvements assume that the average EMDE in the quartile of EMDEs with the poorest scores in the liner shipping connectivity index and logistics performance

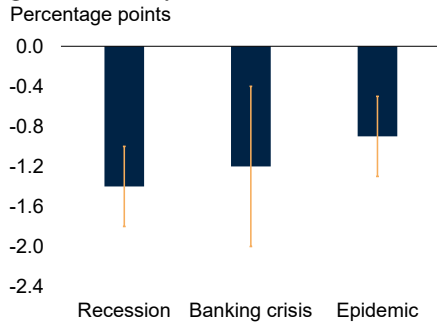
index improves to match the score of the average EMDE in the quartile of EMDEs with the best scores for the liner shipping connectivity index and logistics performance index. The comprehensive package assumes that all three scores are improved simultaneously. Data refer to 2018. Gray line indicates 1 (that is, unchanged trade costs in 2018) among the sample of EMDEs scoring in the poorest quartile on these indicators.

Figure 7. Evolution of potential growth

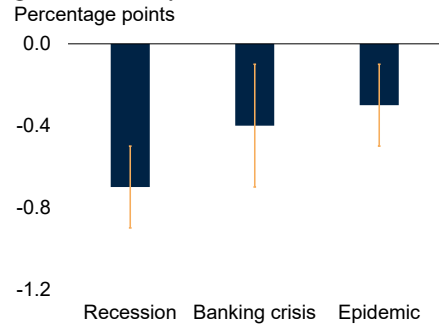
A. Potential growth estimates (range across methodologies) **B. Contributions to potential growth**



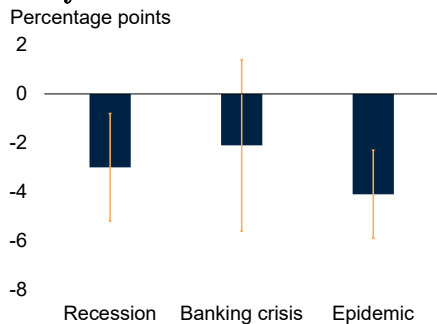
C. Response of potential output growth five years after events



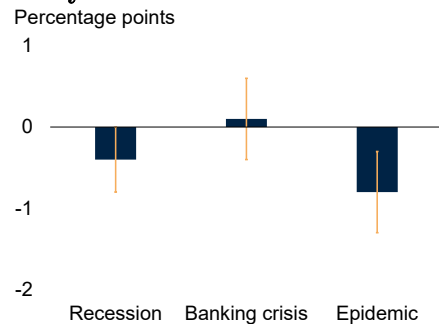
D. Response of potential TFP growth five years after events



E. Response of investment growth five years after events



F. Response of employment growth five years after events

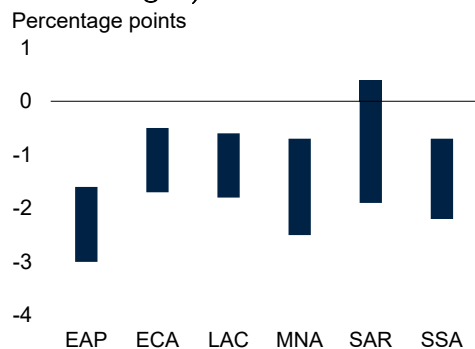


Sources: Penn World Tables; World Bank.

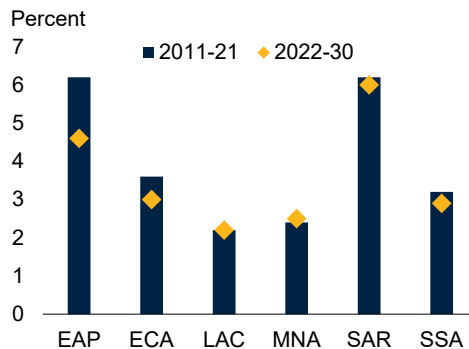
Note: AEs = advanced economies; EMDEs = emerging market and developing economies. A. Blue bars denote production function-based estimates. Vertical lines indicate range of eight estimates. Decade-averages of GDP-weighted average potential growth estimates of varying samples. B. Based on production function approach. C.-F. Blue bars are coefficient estimates from local projections model. Vertical lines indicate 90 percent confidence interval. Sample and methodology are described in chapter 1 of Kose and Ohnsorge (2023).

Figure 8. Potential growth in EMDE regions

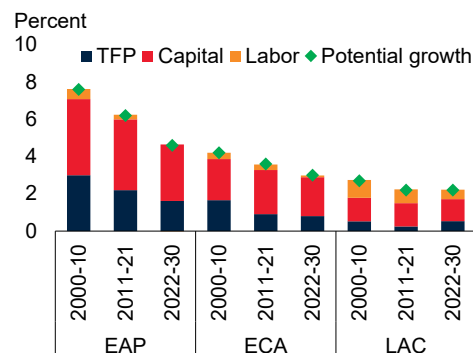
A. Changes in potential growth between 2000-10 and 2011-21 (across methodologies)



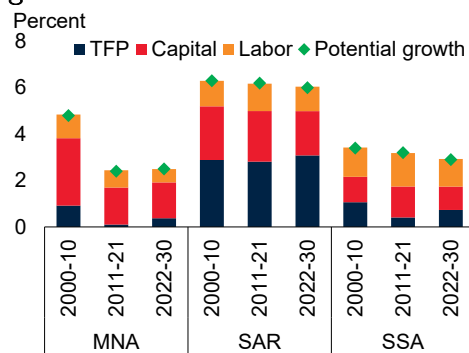
B. Potential growth



C. Contributions to potential growth



D. Contributions to potential growth



Sources: Penn World Tables; World Bank.

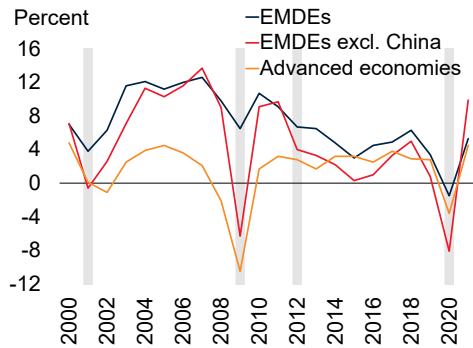
Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. Period averages of annual GDP-weighted averages.

A. Samples differ across measures, depending on data availability. PF = production function approach. MVF = multivariate filter-based. UVF = univariate filter-based (specifically, the Hodrick-Prescott filter). “Exp.” = estimates based on five-year-ahead World Economic Outlook growth forecasts. For SAR, insufficient data available for filter-based estimates until 2010. The sample includes three countries in EAP (China, Philippines, and Thailand), six countries in ECA (Bulgaria, Croatia, Hungary, Kazakhstan, Poland, and Romania), ten countries in LAC (Bolivia, Brazil, Chile, Colombia, Costa Rica, Honduras, Mexico, Paraguay, Peru, and Uruguay), three countries in MNA (Jordan, Morocco, and Tunisia), four countries in SAR (Bangladesh, India, Pakistan, and Sri Lanka), and three countries in SSA (Cameroon, Namibia, and South Africa). Due to the limited sample, other measures are excluded from the SAR region. B.C.D. Based on production function approach. Sample includes 4 countries in EAP, 9 in ECA, 15 in LAC, 7 in MNA, 2 in SAR, and 13 in SSA. Note that quantitative estimates may differ from those presented in panels A and B because of sample differences. Panels A and B ensures

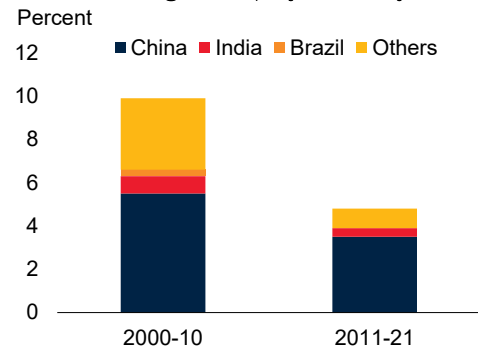
sample consistency across measures; panels C and D ensure sample consistency across time. 2022-30 are forecasts.

Figure 9. Global investment

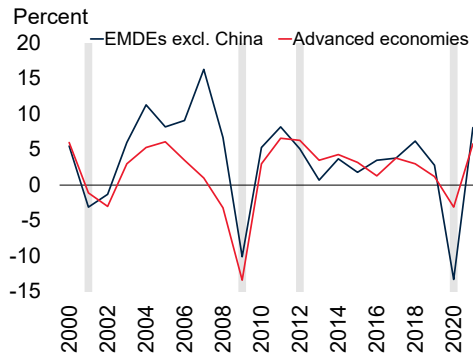
A. Investment growth



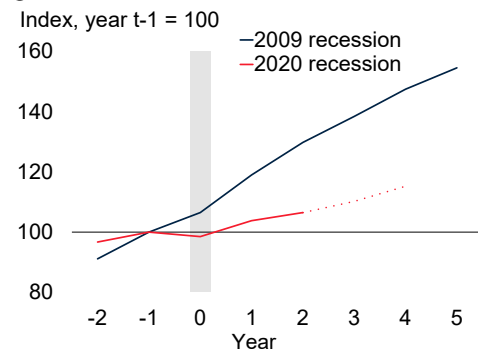
B. Contributions to EMDE investment growth, by country



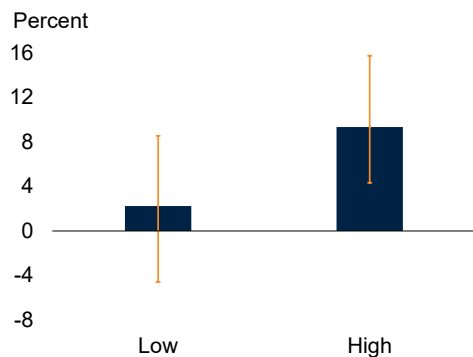
C. Private investment growth



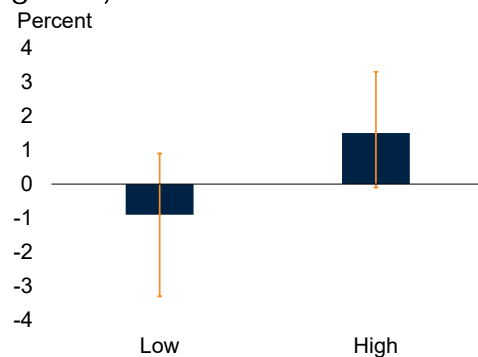
D. Investments in EMDEs around global recessions



E. Investment growth in EMDEs with high and low credit growth, 2000-21



F. Total factor productivity growth in EMDEs with high and low credit growth, 2000-21

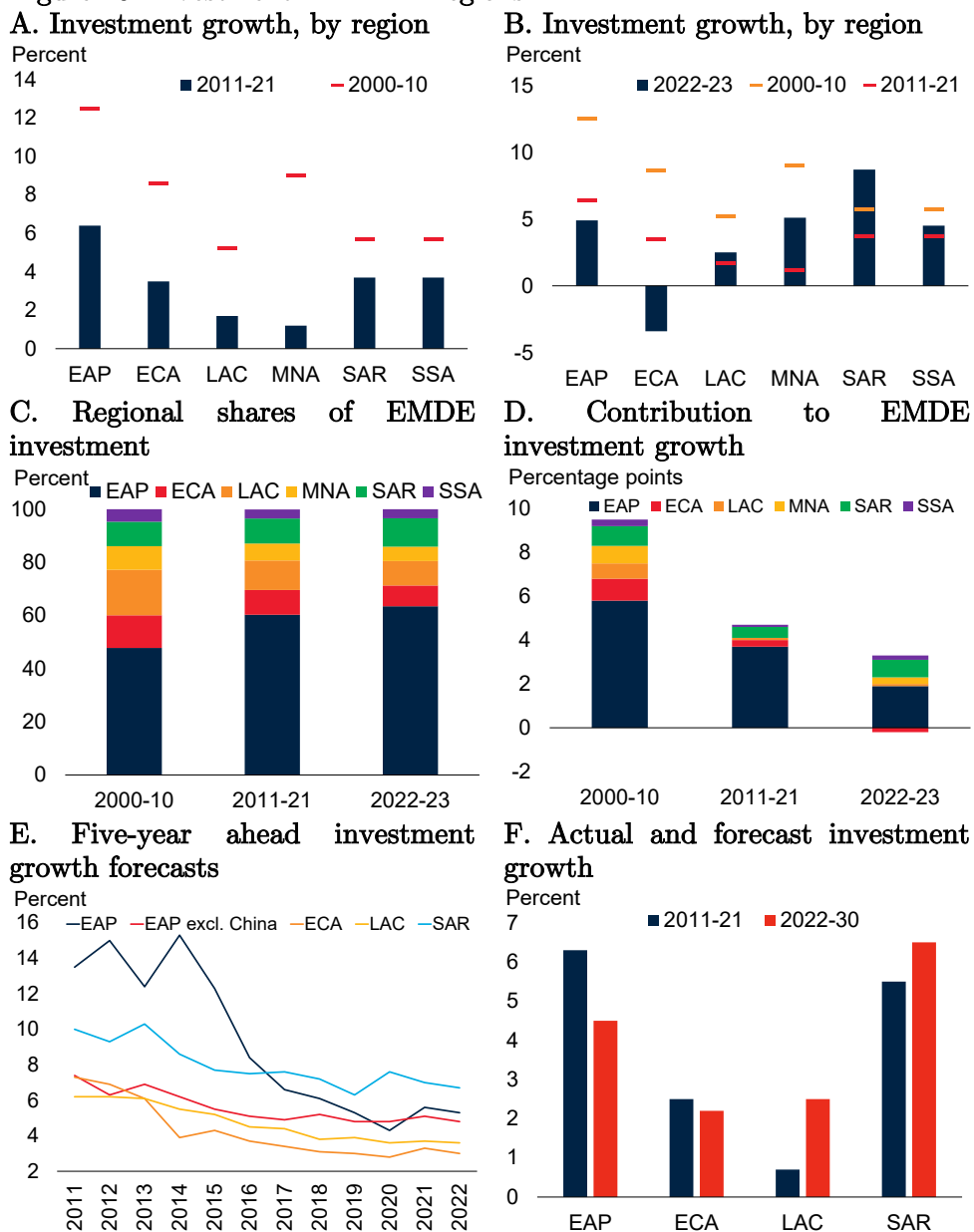


Sources: Haver Analytics; World Bank.

Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. Period averages of annual GDP-weighted averages. EMDEs = emerging market and developing economies. Investment refers to gross fixed capital formation.

A.C. Investment-weighted averages. Shaded areas indicate global recessions (in 2009 and 2020) and slowdowns (in 2001 and 2012). Sample for aggregate investment (A) includes 69 EMDEs and 35 advanced economies. Sample for private investment (C) includes 32 EMDEs (China is excluded) and 11 advanced economies. B. Bars show the percentage point contribution of each country or country group to EMDE investment growth during the indicated years. Height of the bars is average EMDE investment growth during the indicated years. Sample includes 69 EMDEs. D. On the x-axis, year zero refers to the year of global recessions in 2009 and 2020. Dotted portions of lines are forecasts. Sample includes 69 EMDEs. E.F. Bars show group medians; vertical lines show interquartile ranges. “Low” and “high” indicate years when real private sector credit growth (E) or investment growth (F) were in the bottom and top third of the distribution, respectively, during 2000-21. Difference in medians between “low” and “high” and subsamples is significant at the 1 percent level. Sample includes 69 EMDEs.

Figure 10. Investment in EMDE regions



Sources: Consensus Economics; World Bank.

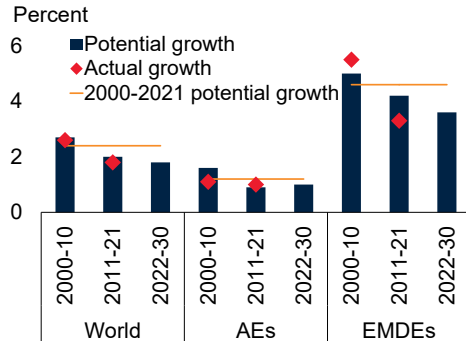
Note: EMDEs = emerging market and developing economies; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. Geometric means over indicated time spans of investment-weighted averages (at real fixed investment in constant U.S. dollars).

A.B. Long-term average stands for 2000-21. Sample includes 8 EAP, 12 ECA, 19 LAC, 9 MNA, 3 SAR, and 19 SSA economies. C.D. Shares for 2000-10, 2011-21, and 2022-23 are simple averages of weighted real investment growth. Sample

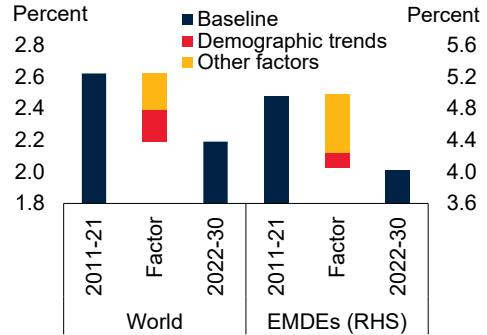
includes 8 EAP, 12 ECA, 19 LAC, 9 MNA, 3 SAR, and 19 SSA economies. E.F. Includes data for six economies in EAP (China, Indonesia, Malaysia, Philippines, Thailand, Vietnam), seven economies in ECA (Bulgaria, Croatia, Hungary, Poland, Romania, Russia, Ukraine), six economies in LAC (Argentina, Brazil, Chile, Colombia, Mexico, Peru) and one economy in SAR (India). Single-year missing data are interpolated. F. Geometric mean of actual investment growth in 2011-21 and of current-year to eight-year-ahead consensus forecasts for investment growth for 2022-30, as of September 2022. Includes six economies each in EAP, ECA, and LAC, and one economy in SAR.

Figure 11. Prospects for potential growth and policies to lift it

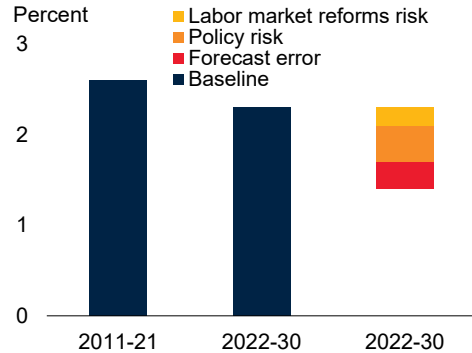
A. Potential growth



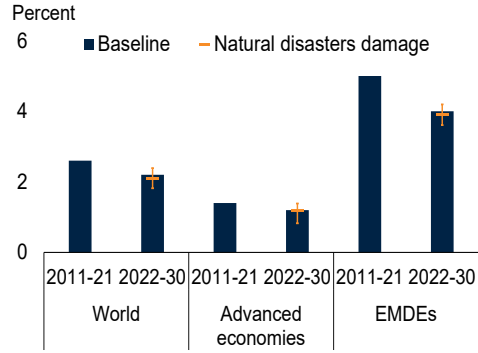
B. Potential growth



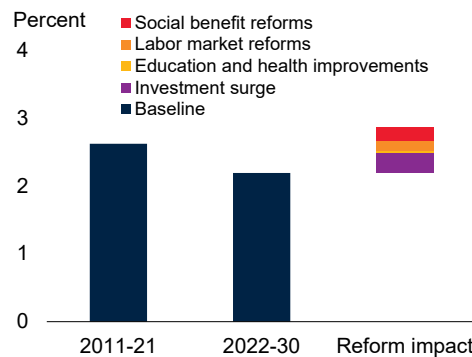
C. Global potential growth, correcting for potential forecast disappointments



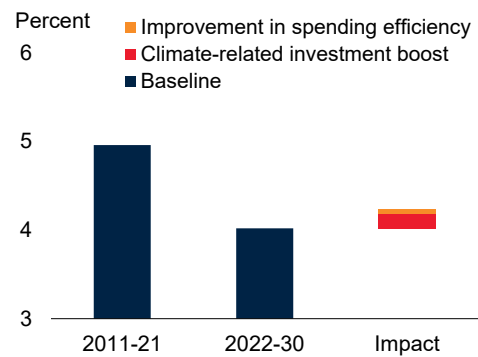
D. Potential growth with more frequent natural disasters



E. Global potential growth under reform scenarios



F. EMDEs potential growth under climate-related infrastructure investment scenarios



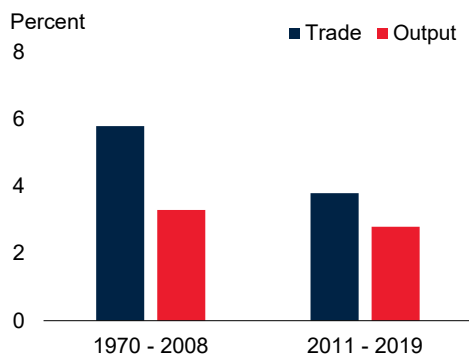
Sources: Penn World Tables; World Bank.

Note: AEs = advanced economies; EMDEs = emerging market and developing economies; LICs = low-income countries; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. Period averages of annual GDP-weighted averages.

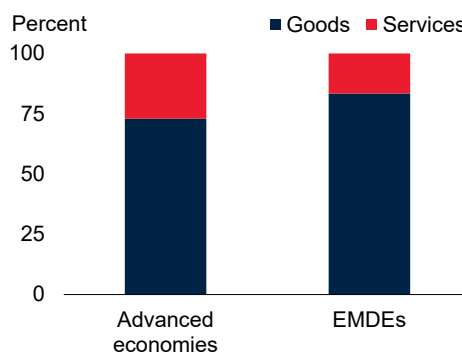
A. Based on production function approach. Sample includes 29 advanced economies and 53 EMDEs. B. Derived using production function-based potential growth. “Other factors” reflects declining population growth, convergence-related productivity growth, policy changes, cohort effects, and a slowdown in investment growth relative to output growth. “Factor” reflects the percentage-point changes between the averages of 2011-21 and 2022-30. C. Baseline and corrections as defined in chapter 5. D. Impact of natural disasters assumes that the number of climate disasters in 2022-30 will increase as much as it rose between 2011-21 and 2000-10 for each country, that is, from once every two years to twice every three years, on average. Orange whiskers display one standard deviation of the impact of climate disasters. E. Scenarios assume a repeat, in each country, of each country’s best ten-year improvement. F. Climate-related investment boost and improvement in spending efficiency as described in chapter 5 of Kose and Ohnsorge (2023).

Figure 12. Reducing trade costs to boost growth prospects

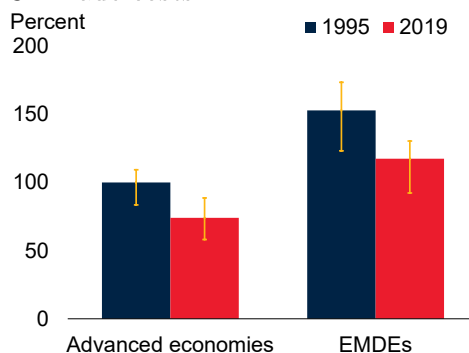
A. Global trade and output growth



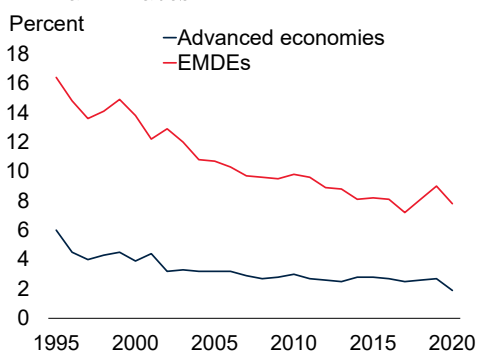
B. Composition of global trade, 2010-19



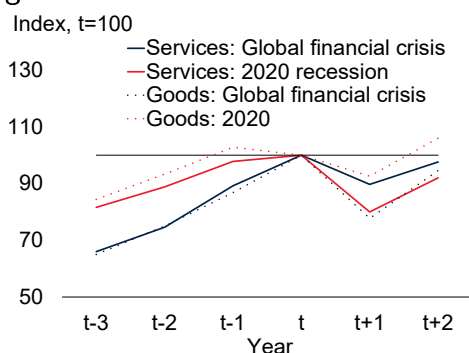
C. Trade costs



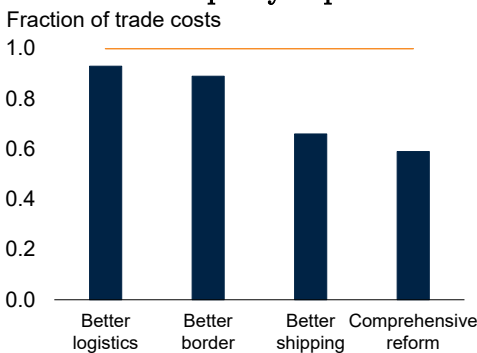
D. Tariff rates



E. Good and services trade around global recessions



F. Reduction in overall trade costs associated with policy improvements



Sources: Comtrade (database); ESCAP-World Bank Trade Costs Database; World Bank; World Trade Organization.

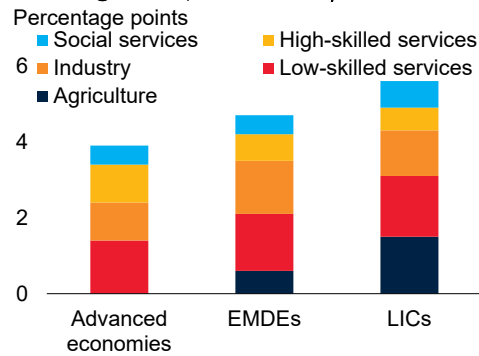
Note: EMDEs = emerging market and developing economies. Trade growth refers to the average growth of import and export volumes of goods and services.

A. Annual average growth. Trade growth refers to the average growth of import and export volumes of goods and services. C. Bilateral trade costs are aggregated into individual country measures using 2018 bilateral country exports shares from the Comtrade database. Bars show unweighted cross-country averages; whiskers show interquartile ranges. Sample in 1995 includes 33 advanced economies and 46

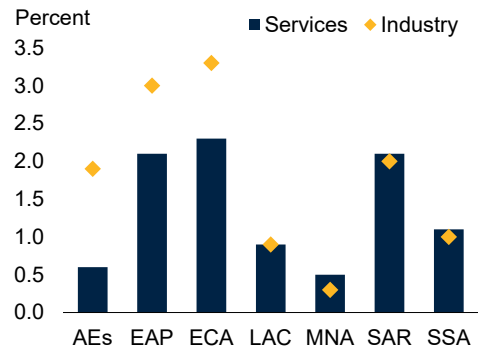
EMDEs. Sample in 2019 includes 23 advanced economies and 53 EMDEs. D. Unweighted cross-country averages of applied weighted tariff rates. Sample includes up to 35 advanced economies and 123 EMDEs. Primary tariffs are used as a proxy for agriculture tariffs. E. Levels of goods and services trade around past recessions and in 2020. t refers to the year before the recession. F. Fraction of trade costs that would remain after policy improvements, as described in chapter 6 of Kose and Ohnsorge (2023). Data refer to 2018. Orange line indicates 1 (that is, unchanged trade costs in 2018) among the sample of EMDEs scoring in the poorest quartile on these indicators.

Figure 13. The role of services in the global economy

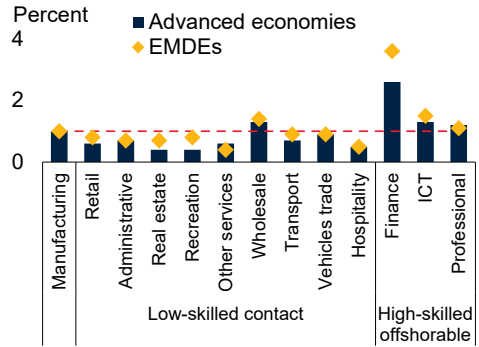
A. Sectoral contributions to value added growth, 1990-2019/20



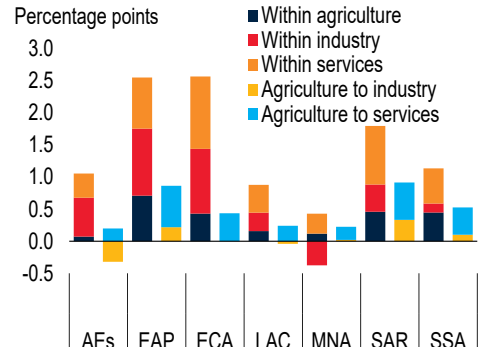
B. Productivity growth, 1995-2018



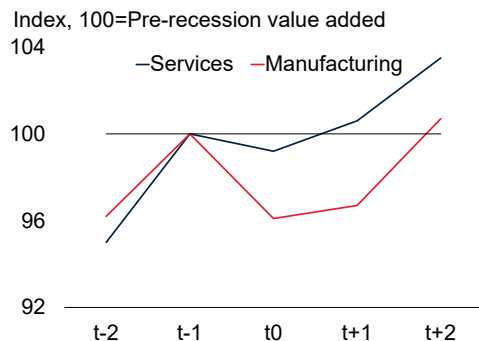
C. Total factor productivity in services relative to manufacturing



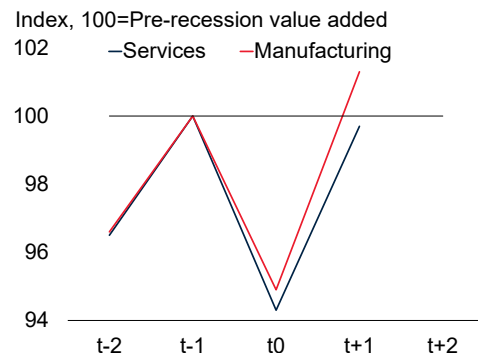
D. Contributions to labor productivity growth, 1995-2018



E. Recessions before 2020



F. Recession in 2020



Sources: Groningen Growth and Development Center (GGDC); Nayyar, Hallward-Driemeier, and Davies 2021a, b; World Bank.

Note: AEs = advanced economies; EMDEs = emerging market and developing economies; ICT = information and communications technology; LICs = low-income countries; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.

A. Bars represent the average contribution of individual sectors to value added growth between 1990-2018. Sample from GGDC's Economic Transformation

Database includes 6 advanced economies, 39 EMDEs, and 6 LICs. B. Average compounded annual growth rates in labor productivity (value added per worker) across each region between 1995-2018. Unweighted average across country groups. C. Total factor productivity (TFP) relative to manufacturing sector in the same country, estimated as in chapter 7. Data are from 56 countries, including 35 EMDEs across all regions. Data are for the latest available year between 2010-17. D. Bars represent labor productivity growth attributed to each sector and movement between sectors for the period 1995-2018. E.F. Recessions are defined as in chapter 7 of Kose and Ohnsorge (2023). Charts show the unweighted average level of real value added in services (blue) and manufacturing (red) in the years around the recession year t , indexed to 100 for the year preceding the recession.

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