

Understanding the Cost of Achieving the Sustainable Development Goals

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Abstract

This paper presents a review of studies that estimate the cost of achieving the Sustainable Development Goals. Although the Sustainable Development Goals provide useful benchmarks for fiscal authorities and donors, typical cross-country costing exercises can be misleading, for a variety of reasons: double counting, sensitivity to underlying assumptions, downplaying the critical role of policy and institutions in advancing toward the goals, failure to discount costs or

consider operation and maintenance costs in a consistent manner, and overlooking the tendency for different types of Sustainable Development Goal–related spending to have distinct effects. Recent costing studies by the World Bank Group have been developed to minimize the drawbacks of earlier studies. The paper also briefly reviews how the World Bank Group engages with stakeholders on the Sustainable Development Goals agenda.

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I. Introduction

The Sustainable Development Goals (SDGs) are a universal call to end poverty, protect the planet, and ensure shared peace and prosperity. They are a key component of the 2030 Agenda for Sustainable Development, an initiative adopted in 2015 by all UN member states. The SDGs encompass 17 goals, each with multiple underlying targets and associated data indicators, to be achieved by 2030. The SDGs replaced the Millennium Development Goals (MDGs), the set of eight goals that shaped the international development agenda during 2000-15.

The twin goals of the World Bank Group (WBG) set the institution's priorities within the SDG framework. In 2013, the WBG adopted the twin goals of ending extreme poverty and boosting shared prosperity. Specifically, the goals are to lower the share of the global population living in extreme poverty to 3 percent and raise the income of the bottom 40 percent of each country's population in a sustainable manner by 2030.¹ While global agreement on the SDGs provides a common international framework for development ambitions, the WBG's goals set the institution's priorities within that framework. The WBG's financial products, technical assistance, and international initiatives all contribute to the global effort to achieve the SDGs.

Progress toward the SDGs has been uneven. In some of the indicators tracked as part of the SDG framework, there has been clear progress (World Bank 2018a). The number of people living in extreme poverty (i.e., below \$1.90 a day) fell by more than 1 billion between 1990 and 2015 (SDG 1). Globally, more than 95 million fewer children were stunted in 2016 than in 1990 (SDG 2). Life expectancy at birth, an important measure of good health and well-being (SDG 3), rose from 65.4 years in 1990 to 72.2 years in 2017. Access to electricity reached 89 percent of the world's population in 2017, up from 83 percent in 2010 (SDG 7; IEA et al. 2019). Yet progress has also been insufficient to meet the 2030 targets in some areas. There are still about 1 billion people, mostly in rural areas, without electricity. Worldwide, more than half of children do not meet minimum proficiency standards in reading and mathematics (United Nations 2018). As of 2015, 2.3 billion people still did not have access to even basic sanitation services. Recent data indicate that climate change has contributed to a rise in the number of undernourished people (United Nations 2018). Developing strategies to accelerate progress in these areas requires an understanding of the costs connected with meeting the goals.

The WBG has played a leading role in the estimation of investment needs. First developed in the context of the MDGs, costing exercises provide benchmarks for donors and national fiscal authorities in their budgeting processes.² These studies have been undertaken by the WBG at the global, regional, and sectoral levels. A major recent costing exercise by the World Bank estimates that low- and middle-income countries face investment needs of \$1.5 trillion to \$2.7 trillion per

¹ The first of the WBG's twin goals is to reduce the incidence of extreme poverty, defined as living on less than \$1.90 per day, to no more than 3 percent by 2030. Target 1.1 under SDG 1 was originally to eradicate extreme poverty, defined as living on less than \$1.25 per day, by 2030. It has since been revised to eradicate extreme poverty using the \$1.90 per day poverty line.

² During the same period, the World Bank and IMF produced a series of Poverty Reduction Strategy Papers to analyze countries' financing needs and major sources of financing (<https://www.imf.org/external/np/prsp/prsp.aspx>). A few studies have pointed out the caveats of MDGs costing exercises (e.g., Clemens, Kenny, and Moss 2004; Devarajan 2015).

year (4.5–8.2 percent of their combined GDP) between 2015 and 2030 to meet infrastructure-related SDGs, depending on policy choices (Rozenberg and Fay 2019).

Costing exercises have also been carried out by other international institutions, but the results are not easily comparable.³ The IMF estimates that additional spending of about \$1.3 trillion (2016 US\$) per year during 2019–30 is required to make meaningful progress toward the SDGs related to infrastructure in low-income developing economies and emerging market economies combined, and another \$1.3 trillion for the SDGs related to health and education (Gaspar et al. 2019). The UN estimates that \$5 trillion to \$7 trillion per year between 2015 and 2030 is needed to achieve a set of SDGs globally, with the estimates being \$3.3 trillion to \$4.5 trillion per year in developing countries, mainly for basic infrastructure, food security, climate change mitigation and adaptation, health and education (UNCTAD 2014). The World Health Organization (WHO) estimates the additional annual investment needed to meet the SDG on health in low- and middle-income countries is about \$370 billion (Stenberg et al. 2017; WHO 2017). The Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD) and the World Food Programme (WFP) jointly estimate that an average of \$265 billion per year is needed during the period 2016–30 to sustainably end hunger (FAO, IFAD, and WFP 2015).

Although they are useful starting points for fiscal authorities and for donors, typical cross-country benchmarking exercises can be misleading, for several reasons:

- *Double counting.* Costing exercises using an accounting approach can double-count investment needs by ignoring synergies across different types of investment and across countries. For example, improvements in water and sanitation infrastructure can reduce child mortality. Improvements in health indicators can reduce poverty, and vice-versa. In South Asia, differences in seasonal patterns of energy supply and demand across countries implies that unrestrictive cross-border energy trade would reduce the need for building new power plants (Timilsina et al. 2015). In addition, benchmarking exercises do not attempt to optimize the supply of infrastructure, and typically do not consider the sensitivity of estimates to assumptions about growth and socioeconomic challenges, such as the effect of the migration of large numbers of people across national borders on demand for infrastructure services or the growing impact of natural disasters in many countries.
- *Operation and maintenance costs and discounting.* Many SDG costing exercises do not consider the operation and maintenance needs related to infrastructure, nor are the estimates discounted in a consistent manner. Operation and maintenance costs are significant, especially in the transport and water and sanitation sectors (Rozenberg and Fay 2019). These costs are expected to represent an even larger share of infrastructure investment needs as the number of unserved people falls in the future, and with it the cost of initial capital investments (Hutton and Varughese 2016).

³ The cost estimates provided by the WBG, IMF, and UN are not strictly comparable due to differences in country samples, subsectors (e.g., low-carbon transport in the WBG study—rail and bus rapid transit—versus only roads in the IMF study), and use of discounting, among other things. They also largely differ in their assumptions about initial conditions and other contextual factors under consideration, which do not allow a systematic comparison among various estimates.

- *Role of policy and institutions.* SDG costing exercises largely ignore the critical role of policy and institutions and may put excessive emphasis on financing needs (Kharas 2015). For example, more education spending may not solve the problems of teacher absenteeism and insufficient learning in education facilities. Additional spending will not address shortcomings in budgetary processes, such as poor procurement policies and weak budget execution. Weak institutions, poor functioning of government, and corruption hamper poverty reduction and other development goals (World Bank 2011a; Go and Quijada 2012). Weak governance can also raise fiscal costs.⁴ In the absence of improving absorptive capacity, raising more funds will not necessarily help countries achieve the SDGs. Similar concerns were raised during the era of the MDGs (Bourguignon and Sundberg 2007; Manuel and Hoy 2015; Fresbitero 2016). This is one of the primary reasons why some experts feel that costing development goals is not a worthwhile exercise, and that it would be more effective to focus primarily on the policy and institutional environment in forming strategies to achieve the goals (Devarajan 2015).
- *Short- and long-term dynamics.* Costing exercises typically overlook the tendency for different types of spending to have distinct dynamics in the short and long term, as well as during economic downturns. For example, infrastructure spending has immediate benefits for growth and poverty, while social spending improves development outcomes in the long term. Furthermore, strong social safety nets can cushion the negative effects on development goals during economic downturns (World Bank 2010). They also overlook the presence of absorptive and financing constraints (Bourguignon and Sundberg 2006). Related to this issue, the benefits and costs of policy efforts may affect present and future generations differently (Arrow et al. 2013; Weitzman 2001). For long-term development outcomes like climate change (SDG 13) and biodiversity (SDG 14 and 15), the benefits of policy actions that prevent damages may take many years to materialize, while many of the costs would be borne in the shorter term. This is likely also true for human capital related spending to improve the quality of education and health (SDG 3 and 4).

Against this backdrop, this paper focuses on three key areas related to the WBG's involvement in supporting the SDG agenda:

- How has the WBG contributed to global efforts to estimate the cost of achieving the SDGs?
- How does the WBG engage with stakeholders on work related to SDG costing?
- How has the WBG helped advance the agenda related to SDG costing?

⁴ In India, for instance, high levels of teacher absenteeism are estimated to have a fiscal cost of \$1.5 billion per year (Muralidharan et al. 2016).

II. WBG Contributions to SDG Costing

The WBG has contributed significantly to efforts to estimate the investment needed to achieve the SDGs—and, previously, to costing the MDGs. The institution has been at the forefront of the push to broaden the mobilization of development financing beyond official sources. In recent years, the WBG has leveraged technical and country-specific knowledge of its staff to produce studies estimating investment needs at the global, regional, and sectoral levels—in particular, infrastructure investment needs. In view of the drawbacks of providing point estimates of investment needs, the WBG has transitioned to generating cost estimates within ranges, using a variety of scenarios and policy options. Understanding the size of the SDG financing gap is key for developing strategies to achieve the goals.

The WBG has a long record of contributions to the costing of development goals. The WBG's earliest estimates of development goal costing, of \$35 billion to \$75 billion per year, measured the official development assistance (ODA) needed to meet the MDGs (Devarajan, Miller, and Swanson 2002). Since then, the WBG has conducted numerous costing exercises. Over time, the WBG's focus has shifted from estimates of ODA needs to estimates of broader investment needs.

Recent SDG costing studies by the WBG have addressed the drawbacks of previous studies in several ways. Operation and maintenance costs have been included in a number of SDG costing exercises. Recent studies have produced costs estimates with ranges, based on policy choices—including choices related to spending efficiency. The WBG's most comprehensive SDG costing study uses a battery of models to optimize the supply of infrastructure and explore policy options in the context of given targets or objectives.

Understanding the size of the SDG financing gap is key for ultimately achieving the goals. Without a full understanding of the size of the SDG financing gap, policy makers, donors, and international organizations will have difficulty developing financing strategies to support the SDGs. However, while a reliable SDG financing framework is needed, it is insufficient to ensure that the SDGs are met. Policy makers must also ensure that a supportive policy environment is in place.

A. Global estimates of investment needs

The WBG's most comprehensive costing study, *Beyond the Gap*, estimates that meeting the infrastructure-related SDGs, plus infrastructure-related climate change mitigation, will require investment equivalent to 4.5–8.2 percent of low- and middle-income countries' aggregate GDP per year during 2015–30.⁵ In individual countries, however, especially low-income countries, investment needs can represent a substantially larger share of GDP. The study covers five sectors: electricity, transport, water and sanitation, flood protection, and irrigation. These sectors are a subset of the SDGs. The largest investment needs are for infrastructure related to electricity and

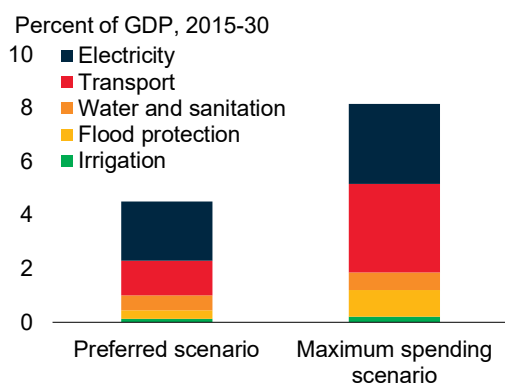
⁵ The findings of Rozenberg and Fay (2019) are backed by the first consistently-estimated stocktaking of *past* infrastructure investment in low- and middle-income countries (Fay et al. 2019). These estimates include a lower-bound estimate of 3.4 percent of these countries' aggregate GDP, a central estimate of around 4 percent, and an upper-bound estimate of 5 percent for 2011, with the corresponding absolute amounts of \$0.8 trillion, \$1.0 trillion, and \$1.2 trillion, respectively. The technical appendix of Rozenberg and Fay (2019) provides information on the low- and middle-income country sample used in the study.

transport (Figure 1A). The range of estimates is based on several key factors: the ambitiousness of the goals, the type and cost of the technologies used to achieve the goals, and assumptions about population growth and urbanization. Of these, the report finds that ambitiousness of the goals (in terms of access and quality) and spending efficiency are the most important determinants of costs.⁶

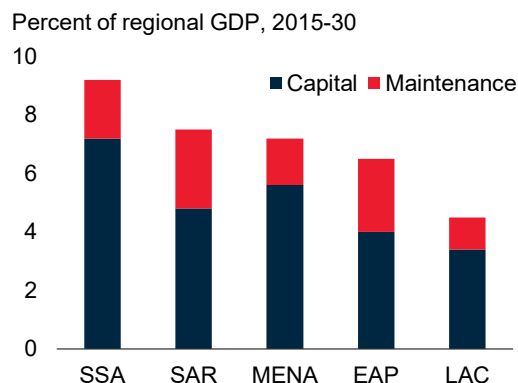
The costing analytics used in *Beyond the Gap* go well beyond those in straightforward accounting exercises in other studies; they also explicitly model policy choices. Rozenberg and Fay (2019) use 14 unique models—a mix of costing models and partial or general equilibrium models—to arrive at the range of cost estimates. In this aspect alone, the report goes beyond the benchmarking and accounting exercises underlying many previous SDG costing studies. Rozenberg and Fay (2019) also explicitly model the outcomes of dozens of policy choices. Ultimately, the report identifies a mix of policies that would allow low- and middle-income countries to achieve key targets identified by the SDGs (universal access to water, sanitation, and electricity; improved food security; better flood protection; and eventual full decarbonization) and restrict spending to 4.5 percent of low- and middle-income countries’ GDP per year.

Figure 1. Spending needs

A. Spending needs in low- and middle income countries



B. Spending needs, by region



Source: Rozenberg and Fay (2019), World Bank.

A. Bars show average annual aggregate spending needs during 2015-30. “Preferred scenario” is constructed assuming ambitious goals and high spending efficiency, and “maximum spending scenario” assuming ambitious goals and low spending efficiency. Country sample includes low- and middle-income countries.

B. Bars show average annual spending needs during 2015-30. Estimates are generated using policy assumptions that cap investment needs at 4.5 percent of LMICs’ GDP per year (i.e., the “preferred scenario” in panel A). SSA=Sub-Saharan Africa, SAR=South Asia, MENA=Middle East and North Africa, EAP=East Asia and Pacific, LAC=Latin America and the Caribbean.

⁶ For example, one of the targets under SDG7 is to “ensure universal access to affordable, reliable and modern energy services by 2030.” This description leaves open to interpretation the *ambitiousness* of energy consumption. For Sub-Saharan Africa, the cost of providing basic electrification—enough to power a few light bulbs and charge a mobile phone, for example—is estimated to be about 0.9 percent of GDP per year, on average, over 2015-30. The cost of providing electrification sufficient to power lighting plus household appliances is estimated to be 1.1-1.2 percent of GDP.

Beyond the Gap improves upon many previous costing studies by including the cost of future operation and maintenance, and by discounting the estimates. In low- and middle-income countries, annual maintenance costs during 2015–30 are projected to be 0.1–0.2 percent of GDP for water and sanitation, 1.1–2.1 percent of GDP for transport infrastructure, and 0.02–0.11 percent of GDP for flood protection, although costs vary as a share of regional GDP (Figure 1B).⁷ Maintenance is crucial to the supply of reliable infrastructure service. It can also generate substantial savings. In the transport and water and sanitation sectors, for instance, good maintenance reduces the life-cycle cost of infrastructure by more than 50 percent. It is thus crucial that maintenance costs be included in budget planning.

B. Regional estimates of investment needs

The WBG’s SDG costing estimates at the global level build on a significant body of work on infrastructure investment needs at the regional level. In some regions and countries, the investment needs exceed the 4.5–8.2 percent of GDP estimated for the global level. Although not all of these estimates were explicitly produced to track progress toward the SDGs, they all cover sectors included in the SDGs. These costing exercises use different country samples and time periods. They also differ in their definitions of the targets to be achieved with investment (e.g. SDGs or other policy goals) and in whether they include maintenance costs. These differences across studies make comparability challenging. Moreover, these studies, whether conducted by the WBG or other institutions, typically do not attempt to optimize future investment needs in light of the historical, and possibly constrained, relationship between infrastructure, income level, population, and urbanization (Fay et al. 2017).

- *East Asia and Pacific.* Progress in the development of infrastructure has been uneven within the region. Among East Asian and Pacific countries, Cambodia and Myanmar require the most improvement in access to infrastructure services (Marcelo Gordillo et al. 2017). For example, about 60 percent of Cambodia’s population has access to electricity, but 20 percent of the power generated is lost in transmission and distribution.
- *Europe and Central Asia.* Despite recent moves toward greater infrastructure links, countries in Central Asia remain poorly connected to the rest of the region and the rest of the world, as reflected in elevated cost and time of transport (Gould 2018). Limited resources to rehabilitate, operate and maintain existing infrastructure in the region present a challenge to providing reliable infrastructure services.
- *Latin America and the Caribbean.* Between 2008 and 2013, regional investment in infrastructure averaged 2.7 percent of GDP, lower than the 4–5 percent of GDP average infrastructure investment needs estimated by the literature (Fay et al. 2017). Although access to water and electricity in Latin America and the Caribbean is relatively high, the region underperforms in transportation. Within the region, access is uneven, and provision of some services is inefficient, ultimately holding back progress on multiple SDGs. The

⁷ In a recent study, Hallegatte, Rentschler, and Rozenberg (2019) analyze the ability of infrastructure systems to function and meet users’ needs during and after natural hazards. They show that maintenance costs will increase in the presence of climate change and natural disasters.

region could narrow its infrastructure service gap significantly by improving spending efficiency.

- *Middle East and North Africa.* In 2013, the region’s additional infrastructure investment and maintenance needs during the 2010s were estimated at about 6.9 percent of regional GDP (\$106 billion per year; Estache et al. 2013). Developing oil-exporting countries needed to commit almost 11 percent of GDP to improving and maintaining their national infrastructure, while oil-importing countries and the Gulf Cooperation Council oil exporters needed approximately 6 and 5 percent of GDP, respectively.
- *South Asia.* In 2014, investment needs to ensure universal access to infrastructure services in South Asia between 2011 and 2020 were estimated to total \$1.7 trillion to \$2.5 trillion (Andres, Biller, and Dappe 2014). On an annual average basis, this amounted to 6.6–9.9 percent of GDP per year—about 3 percentage points higher than South Asia’s investment level in 2009. These estimates need to be considered in the context of data challenges. Better data on expenditure on, access to, and quality of infrastructure are needed in order to improve the efficiency and effectiveness of investment choices.
- *Sub-Saharan Africa.* In the context of the Africa Infrastructure Country Diagnostic (AICD), Africa’s infrastructure needs were estimated at around \$93 billion per year, or about 15 percent of regional GDP (Foster and Briceño-Garmendia 2010). Even if major potential efficiency gains are captured, the region would still face an infrastructure funding gap of \$31 billion per year, mainly for power (Calderon, Cantú, and Chuhan-Pole 2018; Blimpo and Cosgrove-Davies 2019). Moreover, the cost of rehabilitating existing infrastructure in the region, of which an estimated 30 percent is poorly managed, could be significant (African Development Bank 2010).

C. Country estimates of investment needs

The WBG routinely integrates the costs of infrastructure investment into Systematic Country Diagnostics (SCDs). In some cases, the WBG produces these estimates itself; in other cases, it uses estimates from existing country-specific studies. In the context of limited fiscal resources, these estimates are often used to motivate efficiency-enhancing reforms. Recent SCDs on Indonesia and India, for example, address infrastructure spending efficiency.⁸

⁸ Indonesia’s 2015 SCD notes infrastructure investment needs of \$500 billion over the subsequent five years (World Bank 2015a). Increased spending alone is not enough to meet these needs. Reforms are also required, including addressing land acquisition issues, streamlining licensing and permitting requirements, coordinating effectively between various agencies, and accessing private finance. A 2017 assessment estimates that Indonesia’s total investment gap is about \$1.5 trillion (World Bank 2017a). India’s 2018 SCD suggests that infrastructure investment needs are vast. In cities, required infrastructure investments could amount to \$40 billion per year to accommodate an additional 10 million people over the next two decades (World Bank 2018b). Meeting such large investment needs would benefit from collaboration with the private sector to improve efficiency.

D. SDG-specific or sector-specific estimates

Several WBG studies estimate the cost of meeting specific SDGs or meeting goals related to specific sectors:^{9,10}

- *Hunger, food security, nutrition, and sustainable agriculture (SDG 2)*. Additional financing of \$11.8 billion per year may be required to scale up a set of 13 proven nutrition interventions to universal coverage in the 36 countries that account for 90 percent of children who are stunted due to inadequate nutrition (Horton et al. 2010). From a regional perspective, financing needs are highest in South Asia (\$5.9 billion) and Sub-Saharan Africa (\$2.8 billion). Financing needs may be underestimated if malnutrition is due to poor sanitation and hygiene conditions. Another study finds that achieving SDG target 2.2, on stunting, will require \$5 billion per year during 2016–25 in low- and middle-income countries (Shekar et al. 2017).
- *Water and sanitation (SDG 6)*. An estimated \$74 billion to \$166 billion per year of spending on water, sanitation, and hygiene services will be needed during 2015–30 (0.26–0.55 percent of global GDP) to meet targets 6.1 and 6.2 of SDG 6 on clean water and sanitation (Hutton and Varughese 2016). The range is developed through different assumptions about policy choices. As a share of regional GDP, the cost is estimated to be highest in Sub-Saharan Africa (1.3–2.7 percent) and South Asia (0.5–1.1 percent). Additional spending will be required to reach the remaining targets under SDG 6, such as wastewater treatment and environmental water quality (SDG 6.3).
- *Energy (SDG 7)*. The investment required to achieve three targets related to SDG 7 (universal access to modern energy services, doubled energy efficiency, doubled share of renewable energy) has been estimated to be at least \$600 billion to \$800 billion per year over and above existing levels (Angelou et al. 2013). This would imply a doubling or tripling of financing for the sector.
- *Climate action (SDG 13)*. The cost to developing economies of adapting to global warming of 2° C has been estimated at \$70 billion to \$100 billion per year (Narain, Margulis, and Essam 2011). In 2016, an analysis conducted by the International Finance Corporation (IFC) found \$23 trillion in climate smart investment opportunities (or gaps) in 21 emerging economies by 2030 (IFC 2016).¹¹

⁹ Granular cost estimates are critical for costing exercises. For example, the WBG’s Road Costs Knowledge System (ROCKS) records costs related to road-related projects by the WBG, the African Development Bank, and the Asian Development Bank. The database provides unit costs for comparable road work activities for SDG9-related costing exercises (Collier, Kirchberger, and Söderbom 2016; Bosio et al. 2018).

¹⁰ Existing studies are skewed toward evaluating the cost of infrastructure-related SDGs, for which costs are more quantifiable than SDGs that will be achieved chiefly through policy change, such as gender equality (SDG 5) and reducing inequality (SDG 10). Other SDGs, such as those on health and quality education (SDGs 3 and 4), have incomplete costing estimates at the regional or global level due to the lack of data. For instance, a limited number of countries regularly and consistently report health-related spending, leading most global costing studies to make assumptions that result in estimates with wide margins of error.

¹¹ This analysis was followed by a series of reports examining climate smart investment opportunities in particular sectors (IFC 2017a), regions (e.g., South Asia, IFC 2017b), and subsectors (e.g., in cities, IFC 2018).

III. Engagement with Stakeholders on Work Related to SDG Costing

The WBG plays an important role in monitoring quantitative progress toward SDG targets and producing SDG costing exercises, in partnership with other international organizations. The WBG also contributes to the SDG agenda through a variety of external engagements, including thought leadership, international and country partnerships, and participation in public events and discussions related to the SDGs.

A. Monitoring progress

The WBG, in cooperation with other international organizations, collects and curates data related to the SDGs. Reliable, timely data are a necessary input for monitoring progress toward the SDGs and identifying remaining gaps, producing SDG costing exercises, and providing effective and efficient policy choices. The WBG's data monitoring efforts are carried out alongside domestic authorities' own efforts to track progress toward the goals, including as part of the UN's annual voluntary national review process (UN DESA 2018).¹²

- *Data collection as part of the Inter-agency and Expert Group on SDG Indicators.* To monitor the 17 SDGs, a framework of 169 targets and more than 230 indicators was developed by the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs), a group of UN Member States with international agencies as observers. Various international agencies are assigned as “custodians” of the SDG targets.¹³ Of the more than 230 indicators tracked as part of the framework, the WBG is the custodian or co-custodian of 20 indicators. These 20 indicators fall under nine SDGs: SDG 1 (poverty; Figure 2A), SDG 3 (health), SDG 5 (gender), SDG 7 (energy), SDG 8 (work and economic growth), SDG 9 (infrastructure), SDG 10 (inequality), SDG 16 (peace, justice, institutions), and SDG 17 (partnerships). The WBG is also involved in the monitoring of another 22 indicators, under an even wider range of goals.
- *Atlas of Sustainable Development Goals.* Since 2017, the WBG has produced the Atlas of Sustainable Development Goals, which provides a visual guide to the SDGs. The WBG's *World Development Indicators* includes many of the data indicators that are tracked under the SDGs.¹⁴
- *Human Capital Index.* The WBG's Human Capital Index assesses how much human capital a child born today can expect to acquire by the age of 18, given the risks related to health and education prevailing in the country where the child was born (Figure 2B). The index considers indicators closely linked to the SDG targets—specifically, under-5 mortality

¹² An increasing number of countries conduct voluntary national reviews, from 22 in 2016, the year the process was introduced, to an expected 51 in 2019.

¹³ As “custodians,” international agencies work with national statistical offices to develop methodologies for indicators to measure progress on the SDGs. The agencies also work with countries to compile data for SDG indicators, which they submit to the UN Statistics Global SDG database.

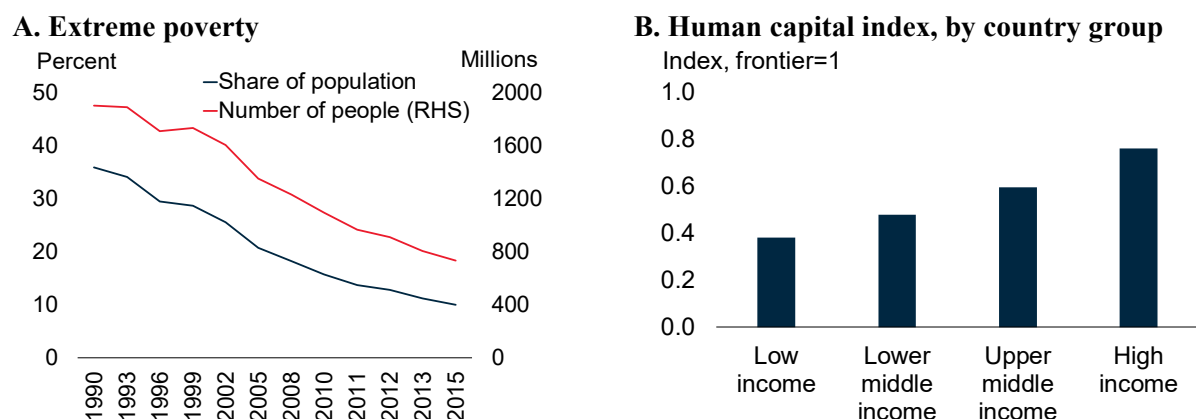
¹⁴ SDG-related indicators can be explored in the *SDG dashboard* (<http://datatopics.worldbank.org/sdgs/>), a web-based interface that allows further exploration of the data (e.g., showing how a particular economy is performing across the 17 goals).

(SDG target 3.2), quality-adjusted years of schooling (SDG target 4.1), adult survival rate (SDG target 3.4), and stunting (SDG target 2.2).

- *The State of Social Safety Nets*. The WBG's *State of Social Safety Nets* tracks progress toward SDG target 1.3, on social protection coverage, and target 1.5, on the vulnerability of the poor to economic, social, and climate-related shocks and natural disasters (e.g., World Bank 2018c).
- *Health Equity and Financial Protection Indicators*. Through its Health Equity and Financial Protection Indicators database, the WBG tracks progress toward SDG 2 (on hunger and nutrition) and SDG target 3.8 (on universal health coverage; World Bank 2018d).
- *WASH Poverty Diagnostic*. The Water, Sanitation, and Hygiene Poverty Diagnostic tracks progress toward sustainable water and sanitation (SDG 6) in 18 countries (World Bank 2017b).
- *WBG flagship reports*. The *World Development Report* (WDR) investigates a different development issue and outcome each year. Recent reports have examined the changing nature of work with key insights on SDG 3 (health) and SDG 4 (education) (World Bank 2019a); the issue of learning to realize education's promise (World Bank 2018e); and the impact of governance and law on development (World Bank 2017c).¹⁵ The *Global Economic Prospects* (GEP) regularly assesses the economic growth of developing countries and the associated topical policy issues affecting the SDGs, such as fiscal space, fiscal policy, and structural policies (World Bank 2015b and 2019b); potential growth and investment prospects (World Bank 2017d and 2018f); the prevalence of the informal economy (World Bank 2019c); and challenges of low-income countries (World Bank 2019b).
- *Joint monitoring reports*. In collaboration with other agencies, the WBG has produced reports to capture the global and country-level progress toward reaching specific SDGs. A joint report with the International Energy Agency and several other international agencies monitors progress towards the SDG 7 on affordable and clean energy (IEA, IRENA, UNSD, World Bank, and WHO 2019). Since 2015, a joint biennial report with the WHO tracks universal health coverage under SDG 3 (WHO and World Bank 2015, 2017). The WBG contributed to the UN's global monitoring report on gender equality (i.e., SDG 5; UN Women 2018).
- *Inter-Agency Expert Group on the SDG Indicators*. The WBG participates in the *Inter-Agency Expert Group on the SDG Indicators*, a group of UN member states and international agencies. This group identifies the specific metrics by which progress toward the SDGs is measured. The WBG leads the methodology and data collection for SDG 1 (on poverty reduction) within the group. Through partnerships with the UN agencies and other international institutions, the WBG collaborates on the development of tools, capacity building, and strategies to achieve the SDGs.

¹⁵ During the era of the MDGs, the WBG's *Global Monitoring Report* provided a global update on progress toward the MDGs.

Figure 2. Monitoring progress toward the SDGs



Source: PovcalNet (<http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx>), World Bank Human Capital Index.

A. Lines show incidence of poverty (\$1.90 per day at 2011 purchasing power parity) at the global level. B. Bars show median of index of each country group. The human capital index calculates the contributions of health and education to worker productivity. The final score ranges from zero to one and measures the productivity as a future worker of a child born today relative to the benchmark of full health and complete nutrition.

B. Partnerships with international agencies

The WBG has partnered with other agencies on initiatives in several areas directly related to the SDGs. In 2018, the heads of the WBG and the United Nations jointly signed the *UN-WBG Strategic Partnership Framework* to implement and finance the 2030 Agenda for Sustainable Development, among three other focus areas. The WBG has partnered with UN agencies on inequality and gender; with WHO and UNICEF on water, sanitation, and hygiene; and with the IMF to strengthen domestic tax systems. Since 2018, the WBG’s Vice President of Equitable Growth, Finance and Institutions serves as one of the co-chairs of the interagency *Informal Working Group on SDG Costing*.¹⁶

C. Partnerships with client countries

As a regular part of its operational work, the WBG partners with country authorities as they develop their plans to achieve the SDGs. WBG support in finance, data provision, and implementation are critical to achieving progress towards the SDGs. Examples of SDG-related WBG partnerships with client countries include:

- *Household surveys*. The WBG committed, in 2015, to helping its clients produce at least one household survey every three years—an important step for monitoring in data-poor countries.
- *Human Capital Project*. In the context of the *Human Capital Project*, the WBG is working with nearly 61 countries to identify barriers to human development (in particular, education

¹⁶ Other co-chairs are high-level officials from the IMF, OECD, and UN Sustainable Development Solutions Network. The working group’s members include representatives of other international organizations, research institutions, and academia.

and health, the subjects of SDG 3 and SDG 4) and develop strategies to reduce those barriers.

- *Tools and modeling work.* The WBG has developed an SDG benchmarking and projection framework that has been applied to well over 16 countries (Gable, Lofgren, and Osorio-Rodarte 2015). This framework has been updated to benchmark countries in the areas of data, finance, and attainment of the SDGs (Amin-Salem et al. 2018) and has recently been complemented by a framework that allows for additional prioritization using network analysis (El-Maghrabi et al. 2018).¹⁷ For particular SDGs, different tools are continuing to be developed to assist country programs. For instance, Climate and Disaster Risks Screening Tools and Climate Metrics have been developed to assist the operational work of the WBG. Global models were also developed to assess the impact of education demographics on global inequality and inequality within countries (Ahmed et al. 2017; World Bank 2018f).

D. Operational alignment

To encourage compatibility of WBG operations with the SDGs, the WBG has also mapped corporate and IDA indicators to the SDG agenda. The WBG's Operations Policy and Country Services (OPCS) has assessed the mapping of the SDGs to the indicators in the Corporate Scorecard and the IDA18 Results Measurement System (RMS) and, broadly, found strong consistency with the SDGs. The exercise shows that 16 of the 17 SDGs are covered by at least one corporate indicator, and that nine of the indicators in RMS are taken directly from the SDGs. For some projects, the WBG uses SDG indicators as project indicators.

E. Advocacy

The WBG staff actively engage stakeholders towards achieving the 2030 Agenda for Sustainable Development. Advocacy activities, coordinated through offices in Washington, DC, New York, and Geneva, include building interagency and intergovernmental partnerships, presenting SDG progress in international fora, and representing the WBG in decision-making processes related to the SDGs.

IV. Advancing the Agenda Related to SDG Costing

Beyond costing exercises, the WBG has advanced the SDG agenda through multiple other channels. These include shifting the financing debate from simply more spending to ensuring spending efficiency, as well as building recognition for the vital role of policy reforms and cross-sectoral synergies in the development of strategy to achieve the SDGs. The WBG is also deeply involved in the global efforts to expand the sources of financing for SDG-related spending—in particular, to the private sector. The WBG supports this work through its country-level engagements.

¹⁷ Recent modeling work related to the SDGs follows a record of modeling work on the MDGs, including through the Maquette for MDG Simulations (MAMS; Bourguignon, Diaz-Bonilla, and Lofgren 2008).

A. Prioritizing quality and efficiency of spending

The WBG is a strong advocate of quality and efficiency of spending related to the SDGs. Specifically, this has entailed advising countries to spend on the right sectors, and to use the right spending metrics—rather than to simply spend more (Fay et al. 2019). These aspects have guided the WBG’s work with its client countries on developing plans to finance investment gaps and the SDGs, including through regular Public Expenditure Reviews and the country engagement component of the *Human Capital Project*, which identifies policy priorities to achieve the education and health-related SDGs (i.e., SDG 3 and SDG 4). The WBG has also engaged in data collection related to spending efficiency, such as the ThinkHazard and CityScan platforms.

Several sectoral examples illustrate how important public spending choices are for development outcomes. For example, access to education is not the same as improved learning outcomes, and education systems in many developing economies do not deliver the learning that builds human capital (SDG4; World Bank 2011b, 2018e). Regarding climate change, the WBG has shown that cost-effective investments are available to advance SDG 13: each dollar invested in early warning systems has been estimated to avoid more than \$4 in losses (Hallegatte 2012).¹⁸ The WBG has underscored that better public spending in agriculture in Sub-Saharan Africa is crucial for improving agricultural productivity (Goyal and Nash 2017).

B. Creating a supportive policy environment

The WBG recognizes that policy reforms, including legal and regulatory reforms, are essential for achieving the SDGs, and works with client countries to implement reforms.¹⁹ As a key part of forming its country programs, the WBG conducts Systemic Country Diagnostics (SCDs) to identify the development challenges and opportunities, including policy challenges. The country-level engagements that follow SCDs, including Development Policy Operations and the Program-for-Results financing, are the chief means by which the WBG supports the 2030 Agenda for Sustainable Development (Development Committee 2015a). A WBG Climate Change Action Plan 2016-2020 has also been developed (World Bank 2016a). At the global level, the WBG is monitoring progress on the creation of an enabling policy environment for achieving the SDGs, such as on sustainable energy (SDG 7) through Regulatory Indicators for Sustainable Energy

¹⁸ However, the quality or access to hydrometeorological services in developing countries has worsened over the past two decades (Rogers and Tsirkunov 2013). As a result, developing countries are less able to detect, anticipate, and adapt to climate change.

¹⁹ Two illustrative examples highlight the importance of policy reforms in advancing toward the SDGs. The first relates to Sub-Saharan Africa, where access to reliable electricity is both a critical obstacle to achieving development goals in Sub-Saharan Africa and itself an SDG target (7.1). To be sustainable, reforms in this area need to achieve both access to affordable electricity for the poor and profitability for power utilities. Such reforms include minimizing losses in transmission and distribution, ensuring customers pay their electricity bills, and raising electricity tariffs appropriately (Kojima and Trimble 2016). A second example relates to South Asia, where power distortions caused by institutional, regulatory, and social distortions are estimated to cost an aggregate 4-7 percent of GDP per year (Zhang 2018). In particular, power shortages experienced in India’s Northern Region would have dropped by 46 percent without any new investment, if the state-government owned power plants had the same level of managerial performance as privately-owned ones. Small-grid solutions and renewable energy might expand access to electricity (World Bank 2018g). A reliable source of funding is needed for operation and maintenance (Rozenberg and Fay 2019).

(RISE). More generally, the WBG engages in policy research, benchmarking, and advisory in many areas related to the SDGs.²⁰

The WBG’s Independent Evaluation Group has produced a series of evaluations that assess the institution’s approach to developing strategies in areas covered by the SDGs. These studies include “Growth for the Bottom 40 Percent” on SDG 10 on inequality (World Bank 2017e), “World Bank Support to Early Child Development” on SDG 4 on education (World Bank 2015d), “World Bank Group Support to Electricity Access, FY2000-2014” on SDG 7 on energy (World Bank 2015c), “The Big Business of Small Enterprises” on SDG 9 (industry, innovation, and infrastructure; World Bank 2014), and “World Bank Group support for innovation and entrepreneurship” on SDG 8 on work and growth (Freeman 2013).

C. Underscoring linkages among sectors

Recent work by the WBG has repeatedly underscored the linkages among the sectors and goals included in the SDGs. First, synergies can be generated by investments in infrastructure (SDG 9) and institutions (SDG 16), along with investments in the social sector (SDG 3, SDG 4; *Human Capital: A Project for the World*). Second, failure to address climate change (SDG 13) is a threat to both poverty reduction (SDG 1) and sustainable cities (SDG 11), in part because climate change can trigger human migration (Hallegatte et al. 2016; Rigaud et al. 2018). In the absence of climate-informed development, climate change could tip an additional 100 million people into extreme poverty by 2030 and could cost cities worldwide \$314 billion per year (World Bank 2016b). Third, water and sanitation upgrades (SDG 6) support efforts to improve nutrition (SDG 2) and health services (SDG 3), and to promote gender equality (SDG 5; World Bank 2017b, 2017f). Fourth, quality and equity in education (SDG 4) are essential to creating decent jobs (SDG 8), promoting gender equality (SDG 5), and reducing inequality (SDG 10; World Bank 2011b, 2017g). As a consequence, the World Bank’s education strategy has evolved from a focus on basic education in the beginning of the 2000s to “Learning for All” starting in 2010.

D. Performance-based allocation of concessional financing

The WBG underscores the importance of the overall quality of policy and institutions in allocating concessional loans to the poorest countries under the International Development Association (IDA). The formula, called the IDA Resource Allocation Index (IRAI) is based on the results of the annual CPIA (country policy and institutional assessments) exercise, which covers the IDA eligible countries. The CPIA rates countries against a set of 16 criteria grouped into four clusters: (a) economic management; (b) structural policies; (c) policies for social inclusion and equity; and (d) public sector management and institutions. The criteria are intended to capture the key factors

²⁰ This includes informality, potential growth, and the future of work in the face of technological advancement (all related to SDG 8, as in World Bank 2018f, 2019a, 2019c); governance and fragility (related to SDG 16, shown in the *World Governance Indicators* and World Bank 2017c); global financial inclusion (an enabler for several SDGs); gender equality (SDG 5, featured in *Women, Business and the Law*); education and health (SDG 3 and SDG 4, featured in the *Human Capital Project*); and fiscal space (an enabler for several SDGs).

that foster growth, poverty reduction, and other development outcomes without imposing undue burden on the assessment process (World Bank 2018h).

E. Raising awareness of the challenges for meeting the SDGs

The WBG utilizes its advantage at producing high-quality analytical products to raise awareness of the obstacles to achieving the SDGs and the impact of not achieving the SDGs. For instance, Mani et al. (2018) demonstrate that higher temperatures and shifting precipitation patterns will reduce living standards of more than 800 million people across South Asia. The changes in average weather projected under the carbon-intensive scenario could reduce total GDP by \$171 billion in Bangladesh, \$1,178 billion in India, and \$50 billion in Sri Lanka by 2050. It calls for actions to invest in targeted policies and actions to build climate resilience throughout the region. The 2017 World Development Report, *Governance and the Law*, illustrates how poor governance and weak rule of law could generate ineffective policies that hinder security, growth, and equity (World Bank 2017c). In addition, the Development Impact Evaluation (DIME) program services the global community of researchers by developing case studies, customized data, and evidence ecosystems to produce actionable information and recommend specific policy pathways to maximize impact on development outcomes.

F. Broadening the sources of SDG-related financing

The WBG is acutely aware of limited fiscal space in many of its client countries in its assessments of investment needs. Although the precise magnitude is uncertain, the existence of sizable investment needs to achieve the SDGs in emerging markets and developing economies (EMDEs), even in an environment of highly efficient spending and comprehensive policy reforms, is undisputed. Yet limited fiscal space and rising debt in EMDEs has constrained public funding to meet these investment needs.²¹ Together with other factors, fiscal pressures are expected to extend an already prolonged period of subdued investment growth in EMDEs, despite the need to ramp up investment to make progress toward the SDGs (Appendix 1).

In several strategic documents, the WBG has recognized the large amount of investment—both domestic and external—needed to meet the SDGs, and that ODA represents only part of the external financing sources needed.²² The institution has also advocated for additional sources of financing to achieve the goals. A 2015 Development Committee paper, “From Billions to Trillions: Transforming Development Finance,” underscored the need to shift the debate on SDG financing from purely ODA financing (estimated around \$135 billion) to mobilizing investments of all kinds—public and private, domestic and international (Development Committee 2015b). This paper also shifted the development focus to national reform efforts, effective use of development assistance, and harnessing the benefits that private sector financing can bring. The Financing for

²¹ As shown in World Bank (2019b), government debt has risen substantially in EMDEs, by an average of 15 percentage points of GDP since 2007 to 51 percent of GDP in 2018. In LICs, government debt rose by 14 percentage points of GDP during the same period, to 46 percent of GDP in 2018 after falling to a trough of 32 percent of GDP in 2012. Partially due to subdued output growth, debt has been on a steadily rising trajectory among 82 EMDEs during 1990-2018.

²² ODA, including through IDA, remains a critical source of financing for the poorest countries, however. For some of the poorest countries, fragility, conflict, and violence is a key obstacle, in addition to financing, to achieving the SDGs.

Sustainable Development Report 2019 further recommends reshaping both national and international financial systems in line with sustainable development (United Nations 2019).

The WBG’s Maximizing Finance for Development approach is helping to fill SDG financing gaps by attracting private sector financing and solutions to development challenges. Consistent with the broader view of financing identified in the 2015 paper, the WBG introduced its “Cascade” approach (Development Committee 2017a). The approach aims to mobilize private sources of financing for infrastructure development and address relevant policy constraints prior to tapping public financing from domestic or international sources. Under the WBG’s Maximizing Finance for Development (MFD) approach, the institution systematically leverages financing, expertise, and policy solutions from all sources (public and private) for its client countries (Development Committee 2017b).²³

The effort to increase and broaden the sources of development-related financing has been undertaken across the institution. Under an expanded set of resources under IDA18, IDA is contributing to the advancement of the SDG agenda in the poorest countries. The IFC is helping to strengthen policy frameworks, promote competition, and develop local capital markets through its Creating Markets strategy.²⁴ Private sector involvement is especially relevant to SDGs in sectors in which goods and services are produced partially or completely by the private sector (e.g., energy).

The WBG plays a critical role in facilitating financing vehicles with private components. For instance, the WBG has a long history of helping arrange public-private partnerships (PPPs) for financing the physical and human investment needed to achieve the SDGs. In the infrastructure sector, the WBG tracks private investment at the country and sectoral levels and evaluates the quality of the regulatory framework for PPPs, through its Private Participation in Infrastructure Database. For the past 10 years, the WBG’s green bonds have helped the private sector invest in projects related to climate change (SDG 13), mostly for renewable energy and clean transportation (World Bank 2018i). More recently, the WBG has begun issuing sustainable development bonds focused on clean water and sanitation (SDG 6), life below water (SDG 14), and gender issues (SDG 5), and has been active in promoting green *sukuk*. The IFC’s Managed Co-Lending Portfolio Program has mobilized financing from the private sector for SDG-related projects. The Pandemic Emergency Financing Facility is an example of the WBG’s effort to partner with the private sector for global public good.

The WBG has also made efforts to systemize the SDG financing dialogue with investors at the highest level and formulate concrete action to promote sustainable investments. In early 2019, the IFC launched its “Operating Principles for Impact Management,” a market standard for managing investment funds developed in consultation with major asset managers and development finance

²³ The Maximizing Finance for Development approach has been used in a range of countries and sectors—for instance, in agricultural value chains (World Bank 2018j).

²⁴ The WBG’s Independent Evaluation Group found that the Creating Markets strategy has been successful in making markets more inclusive, competitive, and sustainable in an evaluation of 16 case studies (World Bank 2019d).

institutions. This work is also being carried out through organizing global events such as the G20 Investor Forum in Buenos Aires in 2018 and the APEC Investor Forum in November 2019.

V. Conclusion

WBG operations are centered on achieving development goals aligned with the SDGs. In its operations and lending, the WBG routinely finances investment and spending to improve SDG-related outcomes. The depth of this involvement goes well beyond costing exercises, with heavy emphasis on spending efficiency and alternative financing models.

That said, the WBG has also made significant contributions to global efforts to estimate the cost of achieving the SDGs in recent years. These efforts have been undertaken alongside those of other international organizations, national authorities, and private entities. In recent years, the WBG has made efforts to improve how SDG costing estimates are produced—for example, by incorporating spending efficiency and policy reform scenarios into cost estimates—and to record the existing spending patterns to better understand how to use the available financing resources efficiently.

The WBG also plays an important role in advancing the agenda related to the cost of the SDGs, including by working with client countries to make public spending more efficient and implement better spending policies. Involving the private sector in the financing of the SDGs is especially important given that public finances are constrained and investment is subdued in many EMDEs. The WBG is also contributing to monitoring data related to the SDG targets—a vital prerequisite for estimating the cost of achieving the SDGs—and engages with key SDG stakeholders through thought leadership, country partnership, and advocacy.

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Appendix 1. Subdued investment growth, yet strong investment needs

The weakness in the growth of investment (real gross fixed capital formation) relative to historical averages observed in EMDEs in recent years is expected to continue in the medium and long term. Weak investment growth has adverse effects on growth prospects, and investment is likely to continue to be dampened because of limited fiscal space and excessive corporate leverage. The WBG has produced extensive analytical and policy work on these fundamental challenges.

Post-crisis slowdown in investment growth. EMDEs experienced a prolonged investment growth slowdown after the global financial crisis. Investment growth declined from about 11 percent in 2010 to a low of 2.8 percent in 2015, 5 percentage points below its long-term (1990–2018) average (Appendix Figure 1.1). The slowdown reflected decelerations in both public and private investment growth to well below long-term average rates. Several factors underpinned the slowdown, including a large decline in commodity prices, weak or weakening growth in advanced economies and China, rising and elevated corporate leverage, intermittent spikes in political risk in some economies, and slowing foreign direct investment (FDI) inflows (World Bank 2017d). China, where policy adjustment is rebalancing growth away from high reliance on exports and investment, accounted for a large portion of the post-crisis slowdown in EMDE investment growth. Yet commodity-exporting economies, such as Brazil and Russian Federation, also contributed significantly. In fact, the EMDE investment slowdown was remarkably broad-based.

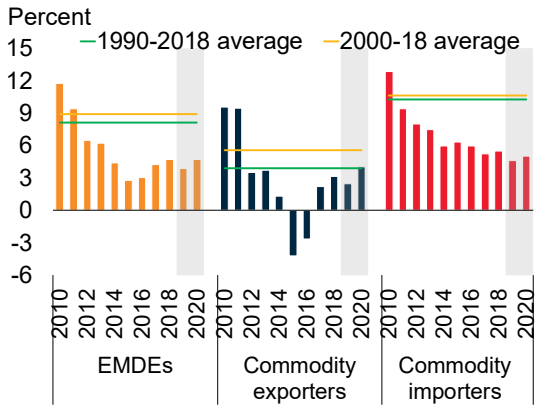
Weak investment prospects. A moderate investment recovery in EMDEs has been underway since 2016 as investment growth accelerated for a third consecutive year in 2018, to 4.3 percent. The upturn reflected a recovery in global trade and manufacturing, a rebound in commodity prices, and country-specific factors in some large economies. However, investment growth is estimated to have slowed again in 2019, to about 2.6 percent, before firming through 2020–21. It is projected to remain below historical averages in many EMDEs, held back by weak global growth prospects and limited fiscal space against a backdrop of elevated government debt (World Bank 2018f). The relationship between limited fiscal space and sluggish investment may be particularly strong for low-income countries, where debt levels have increased in recent years and interest payments are absorbing a rising share of government revenues (World Bank 2019c). Moreover, given downside risks to global growth prospects, it is possible that investment growth in EMDEs will underperform even the moderate projected recovery. The long-term outlook for investment growth has been repeatedly downgraded in recent years, even when China is excluded.

Adverse implications of weak investment. The prospect of weak investment growth in the medium to long term, on the heels of the sharp slowdown in the first half of this decade, raises fundamental concerns about the economic health of EMDEs, in several regards. First, weak investment growth in EMDEs has slowed the pace of convergence in per capita GDP with advanced economies. Second, the slowdown in investment growth has contributed to sluggish capital accumulation in EMDEs, which has contributed to a deceleration in potential growth (Appendix Figure 1.2). Moreover, the investment slowdown may have had an indirect effect on potential growth, by eroding productivity growth through indirect channels, such as the technological improvements

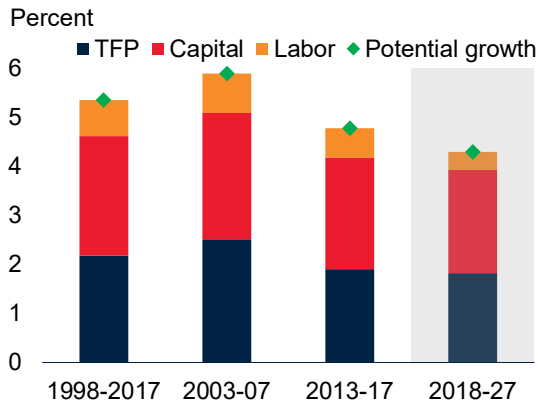
embedded in new equipment or in research and development (World Bank 2018f). Several factors are found to be associated with slower capital accumulation and lower productivity, including high informality (World Bank 2019c). And third, in view of continued weak investment growth, WBG client countries may struggle to fill the large investment gaps needed to achieve the SDGs.

Links between fiscal pressures and SDGs. In view of limited fiscal space in many EMDEs, it is critical that public spending become more efficient, and that sources of financing beyond public funds and official development assistance are explored to ramp up investment in sectors related to the SDGs. Attracting private investment will require improving the institutional environment in EMDEs. Predictable financing also helps the domestic absorption of investment spending, improves the supply response, and lessens real exchange rate volatility and Dutch disease effects (Isard et al. 2006; Devarajan et al. 2008). Structural reforms, such as those that improve the business environment, reduce labor and product market inefficiencies, strengthen corporate governance, and scale back energy and utility subsidies, in turn helping achieve the SDGs.

Appendix Figure 1.1 EMDE investment growth



Appendix Figure 1.2 Contributions to potential growth in EMDEs



Sources: Haver Analytics, Oxford Economics, World Bank.

A. B. Shaded areas indicate forecasts.

A. Investment refers to real gross fixed capital formation (public and private combined). Sample includes 65 EMDEs. B. GDP-weighted averages. TFP = total factor productivity. Sample includes 50 EMDEs.