Building the SDG economy

Needs, spending, and financing for universal achievement of the Sustainable Development Goals

Homi Kharas ⓡ John McArthur

Building the SDG economy:
Needs, spending, and financing for universal achievement of the Sustainable Development Goals
Homi Kharas Ⓡ John McArthur

I. Introduction

Pouring several colors of paint into a single bucket produces a gray pool of muck, not a shiny rainbow. Similarly, when it comes to discussions of financing the Sustainable Development Goals (SDGs), jumbling too many issues into the same debate leads to policy muddiness rather than practical breakthroughs. For example, the common "billions to trillions" refrain on SDG financing falls into this trap. While originally a useful device for calling attention to the need for a paradigm shift in financing, including from private sources, the meme's emphasis on mega-aggregates is now a distraction from operational considerations.

The purpose of SDG financing is to ensure the right mix of resources are available in the right places at the right time to solve specific real-world problems. These include challenges like deprivation of basic human needs, obesity-induced non-communicable disease, species loss from land and oceans, and greenhouse gas emissions into the atmosphere. The SDGs will only be properly financed and achieved when there is clarity on each of the underlying problems to be solved, on the respective mechanisms needed to address them, and on the appropriate mix and volume of resources needed for implementation. In this paper, we stress the need to think beyond financing aggregates to a more granular description of specific types of resource gaps in specific countries. We "zoom out" on the big picture issues in order to encourage "zooming in" on the practical ones.

Our starting point is to ask what it will take to build a new global economy that is consistent with the SDGs, including the imperative to address climate change. We think of an "SDG economy" as one where the aspirations of two foundational agreements on sustainable development are met. One is embedded in the third paragraph of the 2015 United Nations resolution (70/1) that gave us the SDGs, entitled "Transforming our world: the 2030 Agenda for sustainable development." It offers a concise description of the overall ambition:

> We resolve, between now and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. We resolve also to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities.

The second foundational agreement is embedded in paragraph 12 of the U.N.'s 2015 Addis Ababa Action Agenda on financing for development. It makes a commitment for a new "social compact," one that delivers social protection and essential public services for all:

> To end poverty in all its forms everywhere and finish the unfinished business of the Millennium Development Goals, we commit to a new social compact. In this effort, we will provide fiscally sustainable and nationally appropriate social protection systems and measures for all, including floors, with a focus on those furthest below the poverty line and the vulnerable, persons with disabilities, indigenous persons, children, youth and older persons. We also encourage countries to consider setting nationally appropriate spending targets for quality investments in essential public services for all, including health, education, energy, water and sanitation, consistent with national sustainable development strategies.

Within this Addis pledge, the emphasis on nationally appropriate spending targets is crucial. Addis did not envisage a single point estimate of spending needs for all, but instead allowed for country differentiation. Hence each country has a unique fiscal path to developing its own SDG economy.

Ultimately, SDG economies require building public services and societal systems that do three things: ensure essential public services are available to every human being; build fast-growing cities and

industries that succeed on environmental and social terms too; and retrofit currently "advanced" cities and industries that are still not delivering on a range of SDG outcomes, such as the global food system and its adverse effects on health and the environment. In moving towards this vision, all segments of society must contribute. The private sector is crucial for many tasks, but the public sector is dominant for tackling market and coordination failures that cause SDG challenges to persist.[1]

In this paper, we concentrate on what governments themselves must do through public spending, not because it is the only form of spending relevant for the SDGs – far from it – but because it is the form of spending most directly under the purview of policymakers. In doing this, we are able to clarify order-of-magnitude-type assessments of the nature of public spending volumes required for the SDGs. Presuming private dollars are complements to public dollars, the estimates in this paper can be considered as rough lower bounds for SDG spending and financing requirements.

We build on a number of previous studies that have tackled issues of SDG spending, investment, and financing. With an emphasis on infrastructure, UNCTAD (2014) estimates the world's total annual SDG investment needs at roughly $5 to $7 trillion per year, of which around $3.3 to $4.5 trillion per year would be in developing countries. The latter figure includes an annual (public plus private) investment gap on the order of $1.9 to $3.1 trillion. Schmidt-Traub (2015) assesses a broader range of sectoral themes such as agriculture and telecommunications infrastructure to consider all low-income and lower-middle-income countries in the World Bank's classification system, finding total incremental investment needs averaging around $1.4 trillion per year between 2015 and 2030. Schmidt-Traub and Sachs (2015) also estimate incremental annual public and private expenditures of $2-3 trillion required across all developing economies.

More recently, Gaspar and colleagues (2019) at the International Monetary Fund present an input-based framework for assessing SDG spending needs in developing countries, with an emphasis on health, education, roads, electricity, water, and sanitation. They focus on 49 "low-income developing countries" (LIDCs) – countries with per capita incomes below approximately $2,200 and a mix of challenging socioeconomic indicators – in addition to 72 other "emerging market economies" (EMEs) and 34 advanced economies. The authors estimate an additional $0.5 trillion of spending per year is required by 2030 for LIDCs to achieve the SDGs and $2.1 trillion per year for EMEs to do so. The total of $2.6 trillion is equivalent to approximately 2.5 percent of world GDP. Among EMEs, most of the required spending could be financed by countries themselves if they increase domestic resource mobilization (DRM) by up to 5 percentage points of GDP. But for LIDCs, only an estimated $358 of $528 billion in annual spending can be expected from increases in domestic revenues, leaving a remaining gap of $170 billion. Sachs and co-authors (2018, 2019) present a similarly spirited budget gap approach for a slightly larger group of 59 LIDCs, with estimates on the order of $300-400 billion per year in required additional international public finance.

Among more sector-targeted studies, Manuel and colleagues (2018) focus only on SDG-related costs for education, social protection, and health and nutrition in developing countries. They estimate the total spending requirement as nearly $2.4 trillion per year. Of that, less than $140 billion per year is in low-income countries, equivalent to around $188 per capita. The current social sector official development assistance (ODA) gap is estimated at $125 billion per year for the 48 most challenged countries. Other recent sector-specific estimates of SDG-related needs are discussed in more detail in Section IV below.

---

[1] In most countries, national and local governments play a dominant role in the financing of essential public services and in the provision of major infrastructure. Of course, governments also have considerable influence in the allocation of private resources through regulation and policies, but here we follow a similar logic to the World Public Sector Report (UN-DESA 2019), which argues that "budget processes are a critical link in the chain that connects sustainable development objectives, strategies and plans, public spending and finally outcomes."

Although different studies adopt different approaches and produce different absolute scales of estimated need, the general finding of SDG-related analysis is a need for greater public spending, especially in the lowest-income economies.

Considered together, these various studies suggest that a careful consideration of SDG spending needs is best anchored in detailed, bottom-up, country-level assessments – not to provide precise point estimates, but to garner a sense of general magnitudes required to inform public resource allocation decisions. However, amid the many important contributions to date, too little attention has been paid to understanding just how much governments actually already spend on the SDGs, and how that can help inform estimates of incremental financing needs. Government Spending Watch (2015, 2019) is one of the only systematic databases that tries to track what is being spent in a number of SDG-related sectors, but it only covers 78 developing countries and there is no clear-cut assignment between government budget classifications and the SDGs.

In this paper, we estimate public spending for the SDG economy in 2015 for 190 countries, including developing and developed countries. We then estimate minimum SDG public spending needs in 2025 for 134 developing countries. We next calculate the gaps between likely spending and needs, and in turn consider options for financing these gaps. The paper proceeds in six parts. Following this introduction, Section II summarizes key concepts relevant to SDG spending, needs, and financing. Section III presents our bottom-up estimates for current SDG public spending across all countries. Section IV then presents estimates of minimum public spending needs in developing countries. Section V considers the size and financing of the gap between actual spending and spending needs across developing countries. Section VI discusses implications and conclusions.

II. Key concepts: Spending, needs, and gaps

It is important to clarify vocabulary in the SDG context, since words like "spending," "investment," and "financing" are often used interchangeably, even though each has its own technical meaning. In government budgeting terms, spending is typically divided between "investment expenditure," which generally refers to capital expenditures for physical infrastructure, and "recurrent expenditure," which generally refers to operating costs like salaries and supplies. There is considerable debate on where the true conceptual boundaries lie between investment and recurrent expenditures, since recurrent health worker salaries, for example, ought to contribute to the accumulation of a society's stock of productive human capital. In this paper, we do not focus on these types of distinctions, and instead simply focus on total overall public sector spending on the SDGs. Importantly, for sectors like infrastructure, this will include both investment expenditure and major maintenance.

It is also important to stress that spending is often correlated with outcomes, but certainly does not guarantee outcomes. This point can be underscored in at least three ways. First, Figure 1 below compares under-5 child mortality rates with public health spending per capita across countries in 2015. The pronounced downward trend shows clearly that there is a strong correlation between higher public spending and lower child mortality rates. Nonetheless, there is also considerable variation around the trend line. The light horizontal line at child mortality rates of 50 deaths per 1,000 live births draws attention to countries with similar mortality rates but spending levels differing by more than an order of magnitude, ranging from $6 per capita in Eritrea (ERI in figures) to $122 per capita in Gabon (GAB). Meanwhile, looking vertically across countries spending approximately $250 per capita shows child mortality rates ranging from 4 deaths per 1,000 live births in Montenegro (MNE) to 45 deaths per 1,000 live births in Namibia (NAM). Each country has its own mix of factors driving child mortality, and likewise its own mix of practical challenges to address in saving children's lives.

Figure 1: Child mortality rate and public health spending per capita, 2015
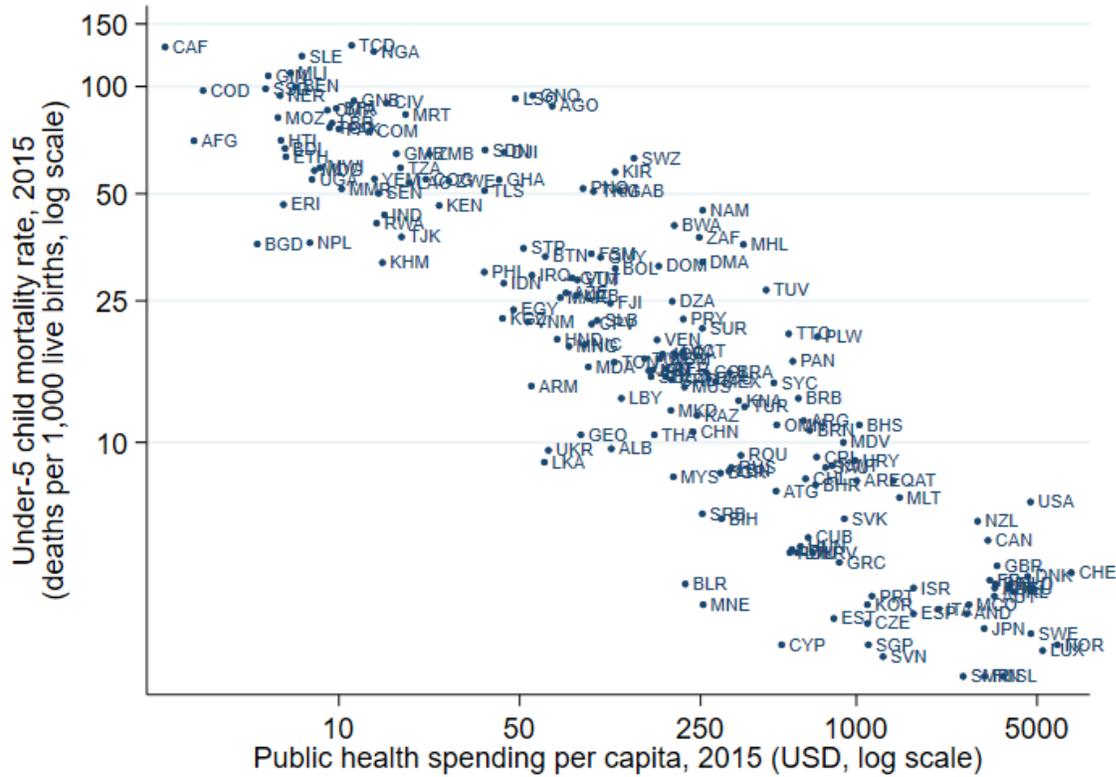
Source: Data from WHO (2017) and World Bank (2019)

Second, even if all spending were to be allocated with full efficiency toward economically productive capital investments, the sequencing and composition of those investments will still be fundamental to SDG achievement. If, for example, infrastructure is built from the beginning in a manner consistent with environmental sustainability and social inclusion, then there is a possibility of achieving the SDGs. If, on the other hand, infrastructure is built solely to boost aggregate economic output without concern for environmental or social impacts until the late 2020s, then it will not be possible to achieve the SDGs. These issues are particularly crucial in light of the dramatic growth in the global capital stock, which is on trend to grow by roughly $100 trillion or more between 2015 and 2030, with a large share of this growth driven by developing countries (World Bank 2013). If the relevant investments are not made in an SDG-consistent manner from the outset, this would in turn require the need for retrofitted infrastructure at a later date, which is likely to require higher cumulative spending than making the right investments the first time.

Third, the solutions to many SDG-related problems will not be driven by simplistic spending increases. For example, the challenge of people being overweight and obese is worsening in nearly every country in the world (Kharas, McArthur, and Ohno, 2019), generating severe long-term health risks and costs to health systems. There are no easy answers to this challenge, and tackling it will require multi-pronged public sector actions – including public education, food industry regulation, urban planning, and investments in research – many of them developed in collaboration with market actors. Governments have a crucial role to play in developing outcome-oriented spending programs that stimulate multi-sector

innovations. In such instances, the design and composition of spending programs is equally if not more important than the scale of spending.

The concept of spending is also distinct from the concept of financing, which pertains to the sources of resources used to support spending. Although money is fungible, different kinds of financing are best used for different purposes, and often come with different maturities, risk profiles and other conditions that make them imperfect substitutes. Public sector SDG spending can be financed through a number of mechanisms, including DRM (e.g., sales and income taxes), market-based government borrowing (e.g., public bond issuances), concessional international finance (e.g., grants and official development assistance), and non-concessional international finance (e.g., loans from multilateral development banks). In this paper, we use the term "needs gap" to refer to the shortfall of actual spending compared to needed spending, rather than the more common term "financing gap," precisely to highlight that the issue is not just lack of finance but a deficiency in effective outcome-oriented spending on the SDGs.

For the SDGs, the key issue underpinning matters of spending and financing is the targeting of resources to match needs. As stated earlier, the SDGs focus on tackling specific problems in specific places, often being faced by specific people. Each of the problems needs a specific spending and financing strategy. However, it is extremely difficult to assess how much it will "cost" to achieve any particular target – i.e., how much will need to be spent. This is partly because the best mix of actions and interventions required to achieve a goal is commonly subject to debate. But even if a specific desired action is already known – like immunizations or functioning neonatal clinics to promote child survival – relative prices and technologies can change considerably over a decade-long horizon or more, all of which drives uncertainty around unit costs.

Another challenge when considering spending needs is that the balance of public and private responsibilities also differs by issue area, so there are natural differences in the degree to which some issues require multi-year government budgeting and others are best left to the competitive forces of private enterprise. At one end of the spectrum, public goods like healthy oceans and infectious disease control require particular leadership from government. At the other end, private actors are likely to dominate product markets in areas like food and digital communications. These are all reasons why any estimates of SDG spending needs should be interpreted with caution, especially longer-horizon estimates that entail sustained assumptions around technologies and prices.

In this paper, we place a conceptual focus on country-level spending, needs, and corresponding gaps to support SDG outcomes, especially in developing countries. This is *not* intended to divert attention from crucial questions of resource efficiency or quality of design in governance, policy, and programs, including in high-income countries. It *is* intended to draw attention to minimum necessary amounts of resources that might be required to build the SDG economy. Targeted, needs-based, and outcome-based approaches are required to reach underserved populations and stimulate more sustainable economic activity.

III. Public spending on the SDG Economy

Below we describe the methods and then results of our SDG spending estimates.

A. Methods

There are two key steps to estimating public spending on the SDGs. The first is to identify sectors and forms of public spending that can be considered SDG-related. The second is to identify relevant data sources and come to a reasonable method of harmonization across disparate reporting methodologies.

Here we list the sectoral categories that we identify as SDG-related, along with corresponding lead data sources (see appendix for further details on sources):

- Social spending is "Public social protection expenditure, excluding health" taken from the ILO (2017) World Social Protection Report Data 2017-2019.

- Agriculture spending is drawn mainly from two sources, due to mixed country-level availability in each source: FAOSTAT's (2019) measure of "General government expenditure on agriculture, forestry, fishing," and IFPRI's (2015) measure of "Percentage of agriculture expenditure in total GDP."

- Health spending is "Domestic general government health expenditure," taken from WHO (2017).

- Education spending is "Government expenditure on education," drawn from World Bank (2019).

- Infrastructure spending is from the IMF's Investment and Capital Stock Dataset (ICSD), 2015. We use "General government investment (gross fixed capital formation)," with defense subtracted where possible using the OECD's dataset on "General Government Spending: Defence (gross fixed capital formation)."

- Biodiversity conservation spending is taken from Waldron et al. (2013), which provides average annualized spending for 2001-2008. We calculate a corresponding average share of GDP for each country and then apply this to 2015 GDP data from IMF (2019b) to derive updated estimates for conservation spending.

- Justice spending is "General government: Expenditure on public order & safety," taken from IMF (2019a), and supplemented by the UNStats (2018) indicator on "Government final consumption expenditure by function: Public order and safety."

For each country, we add the sector-specific data to calculate a consolidated estimate of public sector "SDG spending" in 2015.

B. Results

For all countries with complete data across sectors, Figure 2A shows the aggregate of 2015 spending across these areas for 95 countries, plotted against GDP per capita. The most striking part of the figure is the tight linkage between SDG spending and per capita income. This is not altogether surprising, because countries can afford to spend more as they get richer. In addition, basic services tend to be labor-intensive, non-traded goods, and so become more expensive to provide in richer economies where wage rates and productivity are generally higher. The slope of the trend line is approximately 1.13, meaning that for every 10 percent higher per capita income, countries show an 11.3 percent higher level of average SDG spending.[2]

The second panel, Figure 2B, shows spending estimates for 190 countries, using interpolations for missing data. Missing observations are estimated through one of two ways. Where a country is missing a sectoral value for 2015 but has data for earlier years, spending is calculated as a share of GDP for the most recent available period and that share is applied to GDP in 2015. Where a country has no relevant data for a sector, it is assigned the population-weighted sector average for its region and income group,

---

[2] The slope varies slightly by sample composition. The regression coefficient for Figure 2A is 1.137, which we round down to 1.13 in the remainder of the paper for the sake of conservatism. The coefficient in Figure 2B is 1.15.

Figure 2A: Estimated SDG public spending per capita and GDP per capita, 2015 (countries with complete data across sectors)
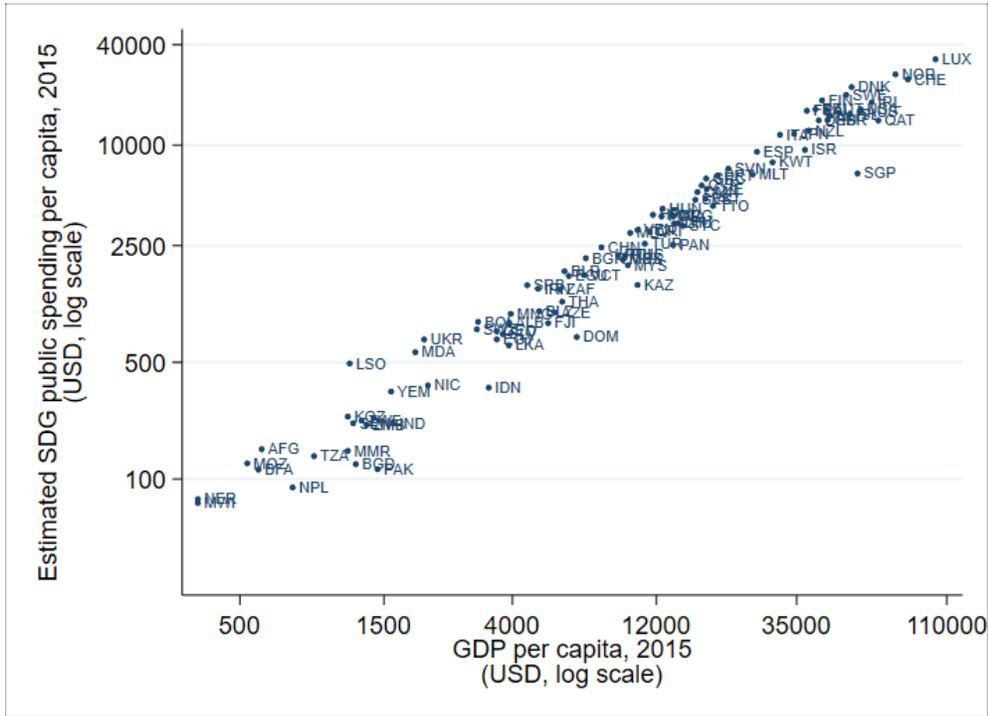
Source: Authors' calculations, based on World Bank (2019) and data sources described in Section III.

Figure 2B: Estimated SDG public spending per capita and GDP per capita, 2015 (includes countries with interpolated data)
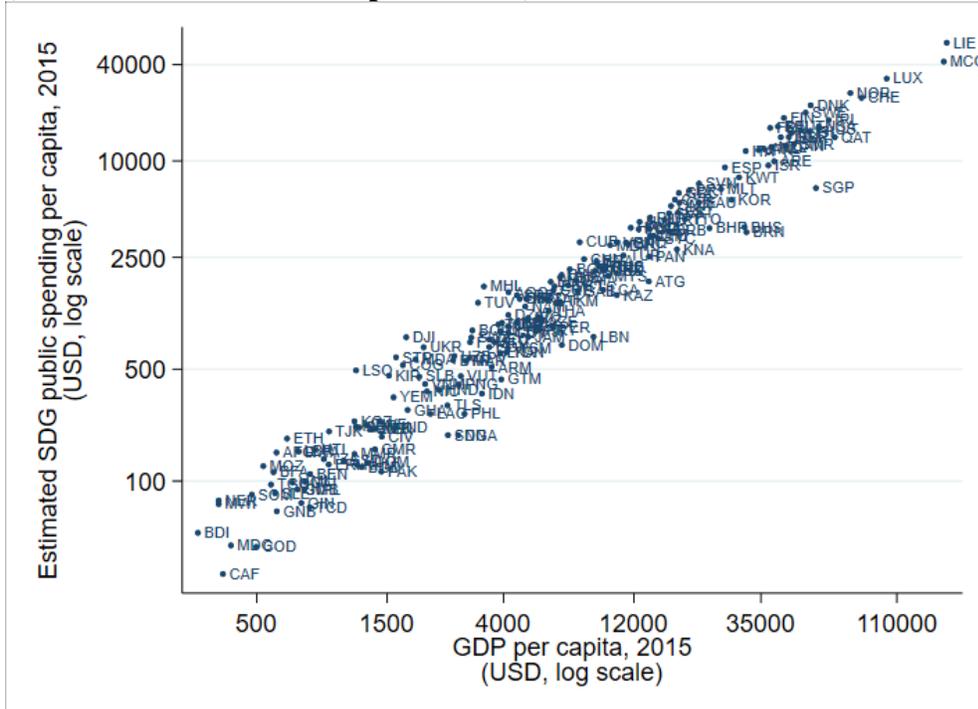
Source: Authors' calculations, based on World Bank (2019) and data sources described in Section III.

again as a share of GDP.[3] In Figure 2B, 14 percent of the observations in the underlying country-level sector data, worth less than one percent of the value of total SDG spending, are estimated through one of these approaches.

Adding up the spending in each country (including interpolated amounts) provides a baseline estimate of global public spending on the SDGs. As shown in Figure 3A, this amounted to a striking $21.3 trillion already in 2015. If recent economic growth trends continue across countries, we estimate that the corresponding number would grow to approximately $32.3 trillion per year in 2030 (in constant 2015 dollars), as long as each country's SDG spending remains constant as a share of national income.[4] If, however, spending grows in line with the estimated slope of approximately 1.13 taken from Figure 2A, SDG-related public spending could grow to approximately $33.6 trillion in 2030, as represented by the right-side bar in Figure 3A.

These results suggest that, barring calamitous slowdowns in the world economy, the idea of global public spending on the SDGs increasing by trillions of dollars per year seems more inevitable than unattainable. But calculating $12 trillion of projected growth in public spending tells us very little about the prospects for SDG achievement. In fact, measuring global spending aggregates to map the likelihood of achieving the SDGs in any single part of the world is about as useful as measuring global rainfall aggregates when trying to grow a plant in the Sahel. The composition of the vertical bars in Figure 3A provides a first layer of insight regarding why. Countries classified as high-income in 2015 are represented with blue shading in the figure. Their spending grows by a third over the period, adding $5 trillion between 2015 and 2030.

Meanwhile, upper-middle-income countries more than double their spending over the same period, adding an even larger absolute difference of more than $6 trillion. Lower-middle-income countries, the thin grey bar near the top, see their spending grow by "only" $1.1 trillion over the period, from $0.8 trillion in 2015 to $1.9 trillion in 2030. Of course, this increment represents 140 percent growth in spending within 15 years, a major proportionate change. Meanwhile, initially low-income countries see an even smaller absolute increase in SDG spending of $120 billion per year, which is barely perceptible in the figure, but still represents more than a 165 percent increase in related annual spending, from around $70 billion to around $190 billion.

Figure 3B shows the same total volumes of spending in 2015 and 2030, but with a sectoral cut. A large share of spending is on social assistance, health, and education, with sizable and growing amounts going into infrastructure. Much smaller annual volumes go into agriculture and justice, and relatively negligible amounts are spent on conservation of biodiversity. Such an assessment provides crucial context for the question of how to build an SDG economy. Again, the SDG financing problem is not one of finding trillions of dollars of additional resources. It is the problem of getting the right composition and volume of resources for the right problems at the right times.

Table 1 delves a layer deeper to consider the components of average spending levels across income groups, but now on a (population-weighted) per capita basis. As of 2015, low-income country governments spent around $115 per capita per year on the SDG economy, including only $8 per person for agriculture, $8 for health, $26 for education, $13 for social spending, $51 for infrastructure, $1 for conservation, and $8 for justice. Total SDG spending rises considerably to an estimated $267 per person in lower-middle-income countries, to $2,200 per person in upper-middle-income countries, and $12,753 per person in high-income countries.

---

[3] GDP shares are generally calculated as 3-year moving averages, although not for estimates of conservation or social spending.
[4] GDP growth to 2030 is projected by first taking the IMF (2019b) forecasts that are available through 2024, and then using a growth rate for 2024-2030 that is set equal to the growth rate from 2018-2024.

Figure 3A: Estimated total SDG public spending, 2015 and 2030, by initial income group
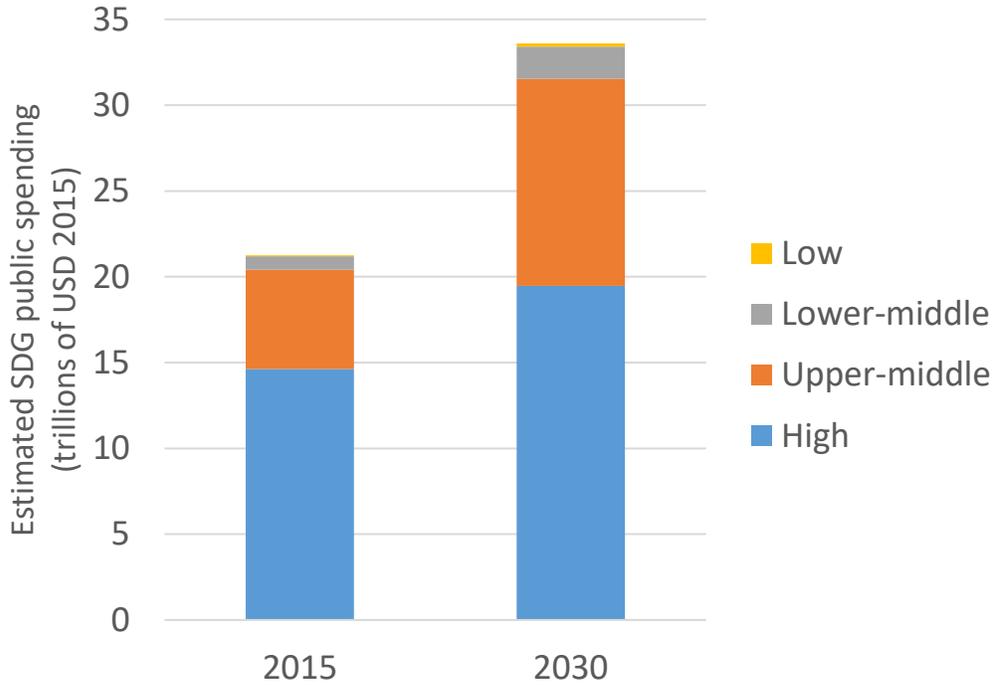
Source: Authors' calculations, using World Bank income classifications for 2015 and data sources described in Section III.

Figure 3B: Estimated total SDG public spending, 2015 and 2030, by sector
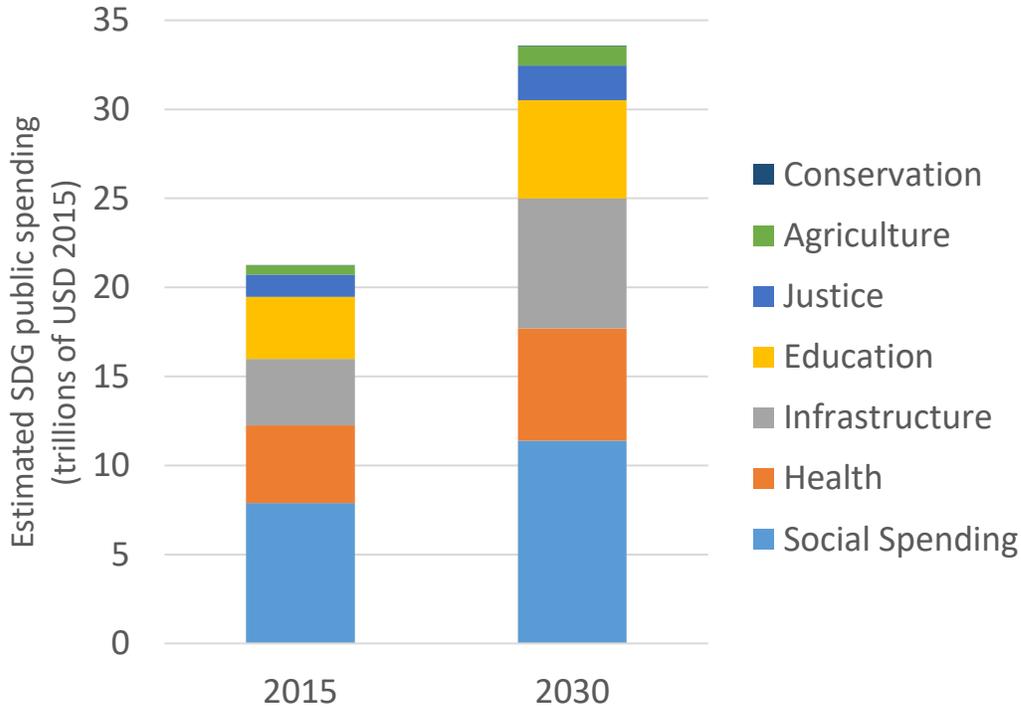
Source: Authors' calculations, based on data sources described in Section III.

Table 1: Estimated SDG public spending per capita in 2015, averages by sector and income group

Sector	Income Group				Global
	Low	**Lower-middle**	**Upper-middle**	**High**	**Global**
Agriculture	$8	$15	$127	$122	$71
Health	$8	$25	$252	$3,154	$598
Education	$26	$71	$353	$2,034	$477
Social Spending	$13	$50	$581	$5,403	$1,080
Infrastructure	$51	$79	$767	$1,287	$514
Conservation	$1	$0.4	$1	$18	$3
Justice	$8	$26	$120	$735	$170
TOTAL	**$115**	**$267**	**$2,200**	**$12,753**	**$2,914**

Source: Income group averages are weighted by population. Authors' calculations, based on World Bank income classifications for 2015 and data sources described in Section III.

Notably, the composition of spending also changes across income groups. For example, the share of health and social spending in total SDG public spending tends to rise as countries get richer – wealthier economies tend to provide more comprehensive old-age, disability, health, and other forms of support to their populations. Meanwhile, the share of spending on agriculture tends to decline at higher incomes, consistent with higher rates of urbanization in advanced economies.

There are also striking differences in the absolute levels of spending across income groups. Although price levels vary considerably across countries, it is noteworthy that the average high-income country spends more on education in only three school days as a typical low-income country does in a full year. Meanwhile, both health and social spending per capita are roughly 400 times greater in high-income countries than in low-income countries. At the same time, very little seems to be spent on conservation at any income level.

IV. Public spending needs to achieve the SDG economy

Here we describe both our methods and results in estimating minimum SDG spending needs.

A. Methods

We draw from existing literature for 10 different SDG-related sectors. Relevant studies of spending "needs" typically start with reference to a "business as usual" scenario and assess the incremental spending that might be required to meet the SDGs. In the best cases, the needs are built up in a detailed fashion by mapping out specific interventions and building on approaches and experiences of what has worked in different environments. In some cases, the estimates assume that the policy environment is at least as favorable as that prevailing in the good-practice countries from which the unit cost experiences are derived. As stressed earlier, these are important qualifications. Resources may be crucial for delivery of incremental actions, but resources alone do not guarantee results.

We translate the various sectoral studies into country-by-country estimates of minimum SDG public spending needs. The results for 134 low- and middle-income countries are based on estimates for each of 10 sectors. Some of the sectoral studies we draw from distinguish between private and public spending needs. In these cases, we only include only the public sector component. We also note that different analyses use different levels of aggregation—sometimes the assessment is for individual countries, other

times it provides averages for country income categories or for geographic regions.[5] Wherever possible, we draw from country-specific underlying estimates.

Sometimes the figures are expressed in absolute dollars per person, sometimes as a percent of GDP. In the latter case, we convert the figures to absolute amounts using the IMF (2019b) as the source for GDP. Different studies presume different paths to scaling up investment and spending over the 2015 to 2030 period. For simplicity of exposition, we focus on needs in 2025, using simple extrapolations where 2015 and 2030 figures have been estimated and using average values where 15-year average investment needs have been estimated. We make adjustments to avoid double-counting across sectors. While we do not vouch for every methodological choice or detailed result embedded within each of the studies cited, we do believe the overall body of literature permits a sufficiently useful analysis to provide an indicative sense of the needed public contributions towards the SDGs in developing countries.

The needs assessments are drawn from the following sources:

Social spending, with emphasis on ending extreme income poverty. For most countries, the driver of poverty reduction is economic growth, and estimates of the number of people in extreme poverty can be calculated from household surveys that provide the mean and distribution of income or spending across the entire population over time. World Data Lab (2019) has taken these figures and forecast the level of poverty in each country in 2025. From these calculations, it is simple to derive the spending on additional social protection transfers that would be required to end extreme poverty, assuming perfect targeting and zero administrative costs. We add this per capita poverty gap figure to an estimate of actual government social protection expenditure in 2025, assuming the share of GDP stays at the reported in ILO (2017). This sum is used as the estimate of the minimum need for social protection spending in each country. The construction of this variable incorporates a dual effect: the need for social protection transfers to tackle extreme poverty declines as the incomes of poor households grow, while, at the same time, actual domestic transfers to tackle national poverty will grow as aggregate GDP and domestic spending levels increase.

Agriculture and rural development, with emphasis on achieving zero hunger. In a 2015 report, the U.N.'s Food and Agriculture Organization and other Rome-based agencies present estimates of spending required to achieve zero hunger by 2030. Their "ZHbotmea" scenario is based on the assumption that zero hunger can be achieved by investments in social protection and additional targeted "pro-poor" investments in agriculture and rural development. We use only the latter investment categories of this scenario, since social protection estimates are already included in the needs for ending extreme poverty, as described above. We similarly exclude costs for rural infrastructure to avoid double-counting with the infrastructure assessment described below. We take the needed additional public investment amounts, averaged over 2016-2030, in the following domains: improving primary agriculture and natural resources (primarily genetic resources and soil and water conservation); improving agro-processing operations; improving institutions such as for land titling and secure tenure; and improving research, development, and extension. Each domain is presented with an estimated public share of responsibility, which we assume to be constant across all regions. We apply this share to the authors' estimates of country-level rural incremental investment required. We then add this amount to our own country-level estimates of agricultural spending in 2015 to obtain estimates of minimum SDG-relevant needs.

Health. Stenberg et al. (2017) estimate health spending needs for 67 low-income and middle-income countries. They define five categories of country, based on measures of conflict, vulnerability, resource availability, health system capacity, and recent health system performance. We assign all countries in our

---

sample to one of the study's five categories. We then use their "ambitious" scenario to estimate health financing need per capita, in which most countries attain the global targets, as opposed to the alternative scenario, whereby judgments on country absorptive capacity limits the possible expansion of health systems. The main cost drivers of the ambitious approach in each country are increasing the health workforce and additional infrastructure, including medical equipment.

Education. The International Commission on Financing Global Education Opportunity (2016) sets out a vision of a world where all children and young people are in school and learning. The report emphasizes some measures that improve outcomes without much increase in spending, such as cutting waste and corruption, and improving community involvement and accountability. Other measures, however, require more resources: in-service training, large scale student assessments, internet access and use of digital technology. In low-income countries, the Commission calls for resources both to broaden access and to improve the quality of learning. We sum up their financing plan estimates for "government expenditure net of grants" and "international finance (of which DAC ODA) grants" to calculate the average annual per capita education needs by income group. We then assign these estimates to individual countries based on their income group, fully appreciating the approximate nature of such estimates.

Water and sanitation. In a World Bank study, Hutton and Varughese (2016) look at interventions to deliver improved water and sanitation in 140 countries, covering capital investment, program delivery to those currently underserved, operations and major maintenance. The report acknowledges that there are different costs associated with different levels of service quality. The baseline estimates assume 50 percent of the underserved households adopt lower-cost options, such as community wells for water supply, improved latrines for sanitation and a basin with soap and water for hand-washing, while the other 50 percent would go straight to a higher level of services like piped water and sewerage. Data on unit costs comes from the Bank's assessment of the literature, supplemented with its own project experiences. We take the Bank's estimates for costs to reach underserved populations in each country and add it to the government spending on water and sanitation in 2015, which we take from Government Spending Watch.

Energy. In another World Bank report, Rozenberg and Fay (2019) provide estimates for reaching 940 million people without access to electricity. Their "preferred" scenario assumes a major investment starting now in renewable energy with higher efficiency, gradually ramping up access to cover the whole population. Although various models generate differing costs depending on the ambition for decarbonization, the World Bank conclusion is that a low carbon option need not be more expensive than a business-as-usual trajectory for electrification.[6] We take their "preferred" scenario for regional infrastructure spending needs for the energy sector (including capital and maintenance) and calculate public sector investment need, assuming common public spending shares by region.

Transportation. The same Rozenberg and Fay report also provides estimates for transport. In their preferred scenario, there is an increased utilization rate of rail and public transport. The authors acknowledge a large range of cost estimates, depending on the assumptions made regarding the rate at which land transport shifts to rail and bus, for both passengers and cargo. We take their estimates for infrastructure spending needs for the transportation sector and apply the same approach to calculating public sector shares as with the energy sector.

---

[6] Note that World Bank figures for total infrastructure investment needs are somewhat conservative – at 4.5 percent of GDP for low and middle-income countries, or an annual average of $1.5 trillion between 2015 and 2030. This compares to other studies, like Asian Development Bank (2017), which estimates infrastructure investment needs of $1.5 trillion per year for developing countries in Asia and the Pacific alone.

Flood protection. One of the targets under SDG11 is to significantly reduce the number of deaths and economic losses occasioned by disasters, including water-related disasters. One way of doing this is by investing in flood protection. Rozenberg and Fay estimate the cost of adopting Dutch standards of coastal flood protection for cities, while accepting some river floods for which costs of protection exceed likely benefits. We take their spending needs estimates for the flood protection sector and again, apply the same methodology as for energy and transport.

Biodiversity conservation. In a 2012 article in *Science,* McCarthy et al. computed the financial cost of meeting global biodiversity targets. They estimate the cost of interventions to reduce the extinction rate for all species and recommend the establishment and maintenance of a number of protected areas. We use their "total investment required by income group" numbers to calculate average per capita estimates of annual biodiversity needs. We then assign per capita averages to corresponding countries.

Access to justice. Manuel et al. (2019) estimate the costs of providing a basic justice system available to all. They aim to address the scale of a global justice gap in which 5 billion people do not have meaningful access to justice. They estimate costs to inform people of their legal rights and to help them exercise these rights. The latter requires a system to resolve grievances, conflicts, and crimes through formal and informal (religious or community) mechanisms. For example, the authors look at increasing the number of police in each country to a target level of one officer per 450 people. For our estimates of minimum public spending needs, we focus on the authors' estimates of required public spending by income group and exclude estimated out-of-pocket personal expenses for things like travel to and from courts.

B. Results

Table 2 shows summary statistics for our country-level estimates of spending needs. For convenience, the table's results are presented on a population-weighted basis per capita, and averaged across initial country income groups as of 2015. We estimate that low-income countries need minimum public spending that averages $344 per person per year for the SDGs, lower-middle-income countries need to spend $583 per person per year, and upper-middle-income countries need to spend $2,559 per year. To avoid spurious precision, we hereafter refer to the minimum public spending need for low-income countries as roughly $350 per person per year.

Although variations are ultimately country-specific, there are some notable patterns across income groups. For example, fewer people tend to live in rural areas in lower-middle-income countries compared to low-income countries, so average spending needs on agriculture are lower in lower-middle-income countries when considered as a share of the total population. Similarly, because the poverty gap declines as income levels rise, the needs for social assistance do not rise steeply between low-income and lower-middle-income countries. However, upper-middle-income countries face greater shares of spending needs in social protection compared to lower-middle-income countries because their politics have moved them towards broader societal motivations for transfers (Desai and Kharas 2017).

The "hockey stick" of SDG financing needs

Overall, the different sectors do *not* show a consistent pattern of steadily rising spending needs as income levels rise. Nonetheless, there is an interesting pattern in how overall SDG spending needs seem to differ by country income level. Figure 4 looks is quite different from the pattern of actual SDG spending shown in Figure 2. Whereas the earlier graph of actual spending shows a tight log-linear fit with GDP per capita, the needs graph shows a hockey stick shape, with a relatively flat "blade" portion at low income levels, followed by a diagonal "shaft" as income levels rise.

Table 2: Estimated 2025 SDG spending needs, by sector and income group average

Sector	Income Group			All developing
	Low	Lower-middle	Upper-middle	
Agriculture & rural development	$44	$28	$195	$97
Health	$91	$124	$289	$186
Education	$57	$139	$525	$284
Social spending	$67	$78	$799	$367
Energy	$10	$65	$327	$164
Flood protection	$6	$11	$32	$19
Transportation	$26	$62	$248	$133
Water and sanitation	$21	$18	$68	$39
Biodiversity conservation	$6	$6	$7	$6
Access to justice	$15	$54	$70	$56
TOTAL	**$344**	**$583**	**$2,559**	**$1,349**

Note: Income group averages are weighted by population. Source: Authors' calculations, based on World Bank income classifications for 2015 and data sources described in Section IV.

Figure 4: The Hockey Stick: Estimated SDG spending needs and GDP per capita, 2025
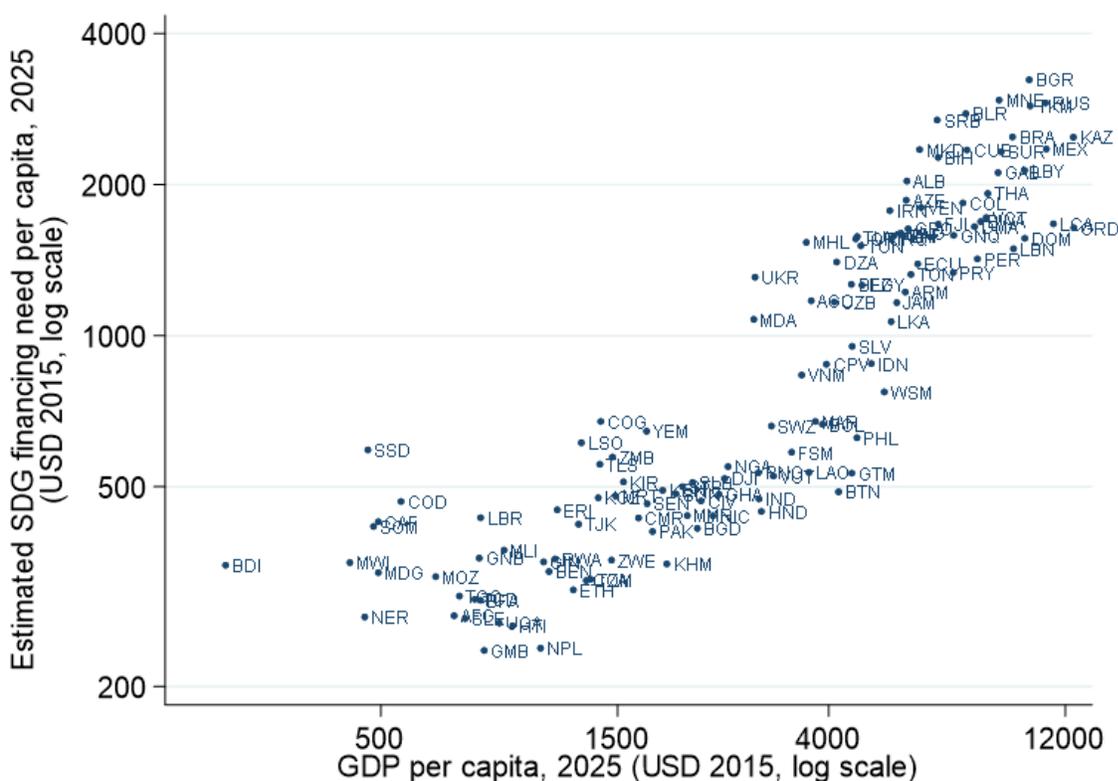
Note: Figure only includes countries with GDP per capita of US$12,500 or less in 2025.
Source: Authors' calculations, based on World Bank (2019) and data sources described in Section IV.

Among the subset of countries classified as low-income in 2015, i.e., with initial per capita income levels below $1,025, the flat blade of the hockey stick averages about $350 per person. Appreciating the sector-specific methodologies and approaches that underpin this $350 average, the result does suggest that some form of minimum threshold should be considered when considering SDG needs, consistent with the idea of a social compact for universal access to basic services, as articulated in the Addis Ababa Action Agenda.

The variation among estimates for low-income countries also underscores the importance of the Addis Ababa call for nationally appropriate spending targets. The Gambia and Nepal have the lowest estimated absolute needs at approximately $240 per capita, while South Sudan has estimated needs of nearly $600 per capita. The Gambia and Nepal's needs are especially low because their extreme poverty rates are low compared to their income level, so they have less need for social transfers to eradicate extreme poverty relative to other countries. In Nepal's case this is partly due to high levels of remittances from abroad to many poor households. South Sudan, on the other hand, is still on trajectory to have one of the highest extreme poverty rates of the world in 2025, resulting in a need for sizeable transfers to tackle the extreme poverty gap.

Amid the variation across countries, there is no decisive point marking the upward diagonal shaft of the hockey stick, but needs grow as income grows and the slope appears to steepen as countries enter upper-middle-income status at around $4,000 worth of GDP per capita. Among countries near that projected income level in 2025, estimates of needs vary from less than $500 in Bhutan to more than $1,400 in Algeria. Among upper-middle-income countries, Bulgaria registers the sample's highest minimum needs, at more than $3,200 per person, which is more than twice the estimated value for Dominican Republic, which has a similar income level.

V. Identifying gaps between SDG public spending needs and projected expenditures

Having generated estimates of both likely spending and spending needs for the SDGs, we can proceed to identify the difference between the two. In theory, gaps could be estimated sector by sector, in order to identify the specific policy areas where resources are adequate or falling short. For purposes of practicality, and recognizing both the imprecise nature of many of the underlying sectoral estimates and individual SDGs are often closely related to each other, we sum up sector-level needs and then calculate overall gaps at the country level. We define the total "SDG needs gap" for each country as the difference between total SDG needs and the estimated current trajectory for SDG spending in 2025. If a country's minimum needs are greater than spending, we define this as a positive "gap." If spending is greater than needs, we assign the country gap to be zero when summing across countries.

To estimate SDG spending in 2025, we make two separate calculations. The first takes each country's SDG spending as a share of GDP in 2015 and applies the same share directly to GDP in 2025, using IMF forecasts. The second takes the 2015 ratio of spending to GDP and applies a 1.13 multiplier relative to each country's growth in GDP per capita out to 2025, in line with the general findings embedded in Figure 2A.[7] Implicitly, the second method assumes that a country continues to increase spending in a manner proportionate to economic growth and that the increment is likely financed by an increase in domestic resource mobilization. For most countries this second approach generates smaller estimated needs gap in 2025 so, in order to err on the side of conservativism, we focus on reporting these results in the remainder of the paper. Results using the first calculation with fixed spending shares are available in the appendix.

---

[7] We fully recognize the econometric crudeness of applying a cross-sectional coefficient to a time-series trend. However, we wanted to be able to identify a plausible range for the SDG needs gaps, and to err on the side of conservatism in the reported figures. Future research could helpfully explore refined estimates of this coefficient.

Figure 5: Estimated SDG needs gap (% of GDP) and GDP per capita, 2025
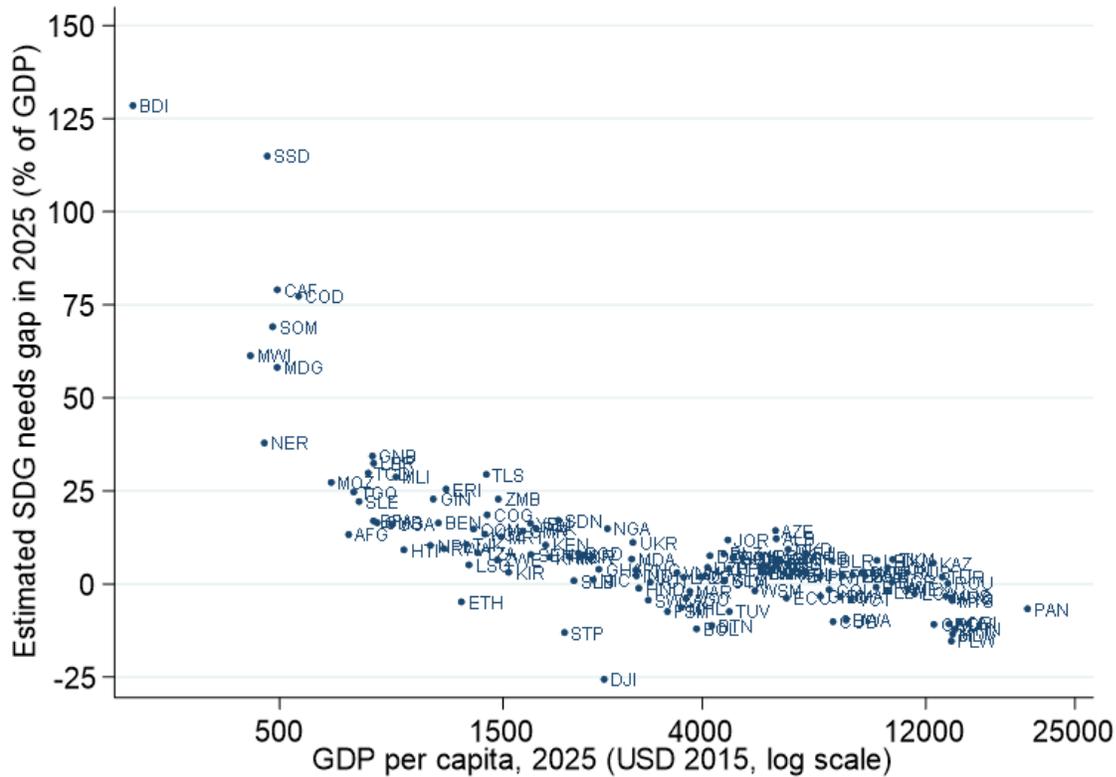
Source: Authors' calculations, based on World Bank (2019) and data sources described in Sections III and IV.

Table 3: Estimated aggregate 2025 SDG needs gap, by country income group

Income Group	SDG needs gap
Low	$150 bn
Lower-middle	$549 bn
Upper-middle	$223 bn
TOTAL	**$922 bn**

Source: Authors' calculations, based on World Bank income classifications for 2015 and data sources described in Sections III and IV.

Figure 5 shows the scatter plot of estimated needs gaps in 2025 for each country, plotted against the country's projected income level per capita. A large majority of the countries in the figure show an estimated gap, including many upper-middle-income countries. For most low-income countries, the gap is large relative to income levels. In fact, in Burundi and South Sudan the size of the needs gap is greater than GDP. Nonetheless, moving down and to the right along the scatter plot, 34 countries have estimated gaps equivalent to zero percent of GDP or less, including Ethiopia, Sao Tome and Principe, Bolivia, Bhutan and many other middle-income countries. Importantly, this does not suggest that these countries are on course to "overspend." It only suggests that they are on a path to have the minimum required

overall resource availability for SDG-oriented public spending, and hence that they will be well-served to focus on effectiveness of spending towards building their SDG economies.

Table 3 presents the sum of estimated SDG needs gaps by initial country income classification, noting that only countries with an aggregate gap are included. Adding the gaps across low-income countries yields a total of $150 billion. Doing similarly for lower-middle-income countries sums to $549 billion, and for upper-middle-income countries sums to $223 billion. Across all developing countries, the total estimated needs gap is $922 billion. The gap is about $80 billion lower than it would be otherwise, due to our assumption of natural expansion in spending driven by economic growth.[8] Again, these numbers should not be interpreted as exact estimates, but as indicative results that help to inform understanding of how public spending by developing country governments could evolve over time to achieve the SDGs.

We note three points regarding the pattern of SDG needs gaps. First, the aggregate gap for low-income countries is large relative to their GDP, but is of the same order of magnitude as current levels of total ODA. So a doubling of current ODA could roughly fill the low-income country SDG needs gap. Second, lower-middle-income countries have the largest aggregate gap among income groups, driven partly by the estimates for several highly populous countries, such as Bangladesh, Egypt, India, Indonesia, Nigeria, and Pakistan. Third, even some upper-middle-income countries have gaps, which can be quite large for some countries and some sectors, but these are not systematic. Many upper-middle-income countries have no gaps, and a number are already spending enough to make rapid progress on the SDGs.

We recognize that additional public spending can only take place if additional resources are mobilized. So, we next consider three scalable ways of financing SDG needs gaps: (i) domestic resource mobilization; (ii) official development assistance, or aid; and (iii) non-concessional borrowing from official development institutions.[9]

(i)   Domestic resource mobilization
The majority of the SDG needs gap will likely be filled through DRM, defined as all government revenue, including social contributions, but excluding grants from abroad. There is considerable potential for increased DRM, both as a result of economic growth and through policy measures to increase tax buoyancy, defined as the responsiveness of tax revenue growth to changes in GDP. While this potential varies from country to country, there is a tight overall relationship between a country's DRM and its level of income per capita. Figure 6 shows a simple plot between the two variables. The slope of the cross-sectional line is 1.2, implying that for every 10 percent higher income, domestic revenues are 12 percent greater.

In Figure 6, there is no indication that the slope differs across income levels, so the proportionate potential for DRM growth is as great in low-income countries as in middle-income countries. This is good news, as it suggests that, for most developing countries, a robust increase in domestic revenues is likely to be commensurate with their continued prospects for at least moderate growth. The fact that the cross-sectional slope in Figure 6 is greater than the slope in Figure 2 is also suggestive that DRM can readily support the historical rate at which SDG spending rises, so the SDG needs gap could fall over time as

---

[8] As reported in the appendix, when we assume a fixed ratio of SDG spending to GDP out to 2025, the total estimated gap adds up to $1,005 billion.

[9] We do not consider public borrowing directly from private capital markets since this raises questions of sovereign debt capacity, pricing, and sustainability that lie beyond the scope of this paper.

Figure 6: Domestic resource mobilization per capita and GDP per capita, 2015

Note: Figure only includes countries with projected GDP per capita of US$25,000 or less in 2025.
Source: Authors' calculations, based on ICTD and UNU-WIDER (2019), World Bank(2019).

Table 4: Estimated contribution towards 2025 SDG needs gap from extra 1% of GDP in domestic resource mobilization effort, by initial income group

Income Group	SDG needs gap	Total contribution of extra 1% DRM
Low	$150 bn	$6 bn
Lower-middle	$549 bn	$97 bn
Upper-middle	$223 bn	$60 bn
TOTAL	**$922 bn**	**$163 bn**

Source: Authors' calculations, based on World Bank country classifications for 2015 and data sources described in Sections III and IV.

countries' economies grow.[10] However, Figure 6 also shows that no low-income country is generating nearly enough domestic revenues to meet the minimum needs threshold estimate of around $350 per person per year, so significant external assistance will surely be necessary. Moreover, admonishments to raise DRM may be of small use for countries that are not enjoying much economic growth, like Burundi, Chad and South Sudan.

While there is clear potential for an expansion of DRM, there is also a need for two notes of caution. First, expansion of DRM will not make a huge dent in the SDG needs gap for the poorest countries. Table 4 shows our estimates of how much an incremental one percent of GDP in DRM effort – on top of the assumed "natural" expansion driven by each country's economic growth – would contribute towards closing gaps in countries that have them (i.e., netting out countries without gaps). As indicated in Table 4, an additional percentage point of DRM would reduce the aggregate gap for all developing countries by around $163 billion. But this sum includes only $6 billion for low-income countries, a tiny fraction of their $150 billion gap from Table 3. For lower-middle- and upper-middle-income countries, there is perhaps more scope for DRM, with an additional percentage point of GDP contributing $157 billion toward the gap. This is significant but a small step towards their overall $772 billion gap we identified for these two categories of countries in the preceding section.

Second, DRM is only beneficial if it is raised in a manner that is not counterproductive to SDG aims. Domestic public finance has many roles to play in a developing country: it is expected to support growth (so corporate and personal tax rates cannot be too high),[11] and provide resources to serve priorities like national defense and long-range scientific research, in addition to meeting the SDGs. Some kinds of taxation do not pose trade-offs among these objectives. For example, higher royalties on mineral taxation, limits on profit shifting to low-tax haven countries, reductions in illicit capital flows, stolen asset repatriation, and subsidy removal could all be implemented in a way that supports all the objectives listed above. But these tax benefits may be quantitatively small in scale and difficult (either politically or technically) to expand. Value-added or sales taxes are the easiest taxes to grow from an administrative point of view, but could negatively impact poverty, inequality and the progress towards the SDGs, as shown by work done by Lustig et al. (2019) at the Commitment for Equity Initiative. They find that, in practice, existing taxes and spending are regressive in many developing countries, and that efforts to use DRM to eradicate poverty (SDG1) would simply be infeasible without changes in the whole structure of taxes and spending.

(ii)   Official aid
A complement to DRM is to fund the gap through greater external assistance. OECD-DAC countries currently provide approximately $150 billion annually in net official development assistance. These countries alone would provide around $200 billion more aid by 2025 if they were to achieve the 0.7 percent of GNI aid benchmark that year. This increment would be more than enough to fill the SDG needs gap for low-income countries. But aid would need to be directed towards actual SDG needs and gaps in these countries. Figure 7 shows there is little relationship, in practice, between net ODA disbursements and recipient country GDP per capita. Moreover, Figure 8 shows the lack of relationship between ODA disbursements and recipient country SDG needs gap. (Note that Figures 7 and 8 exclude small countries with populations of less than 300,000 in 2015, which are presented separately in the appendix.) Some middle-income countries with significant SDG financing challenges might require special prioritization of ODA support too.

---

[10] This also provides some comfort that our reported results assuming spending growth greater than GDP growth are not unreasonable. Again, we recognize that Figures 2 and 6 only show cross-sectional results, and a more rigorous assertion of the relationships with GDP requires analysis of time-series data.

[11] As an important case, India has just announced the largest recent corporate tax rate reduction of any large economy.

Figure 7: Net ODA disbursement per capita and GDP per capita, 2015
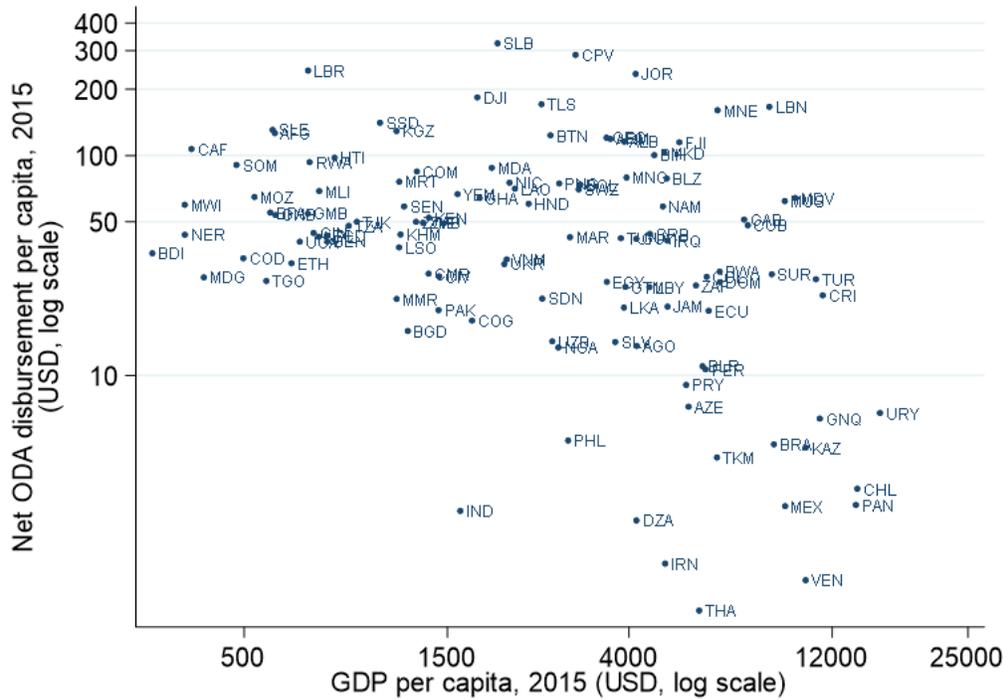
Note: Figure includes countries with populations of at least 300,000 people in 2015.
Source: World Bank (2019).

**Figure 8: Net ODA disbursement per capita and estimated SDG needs gap per capita, 2015**
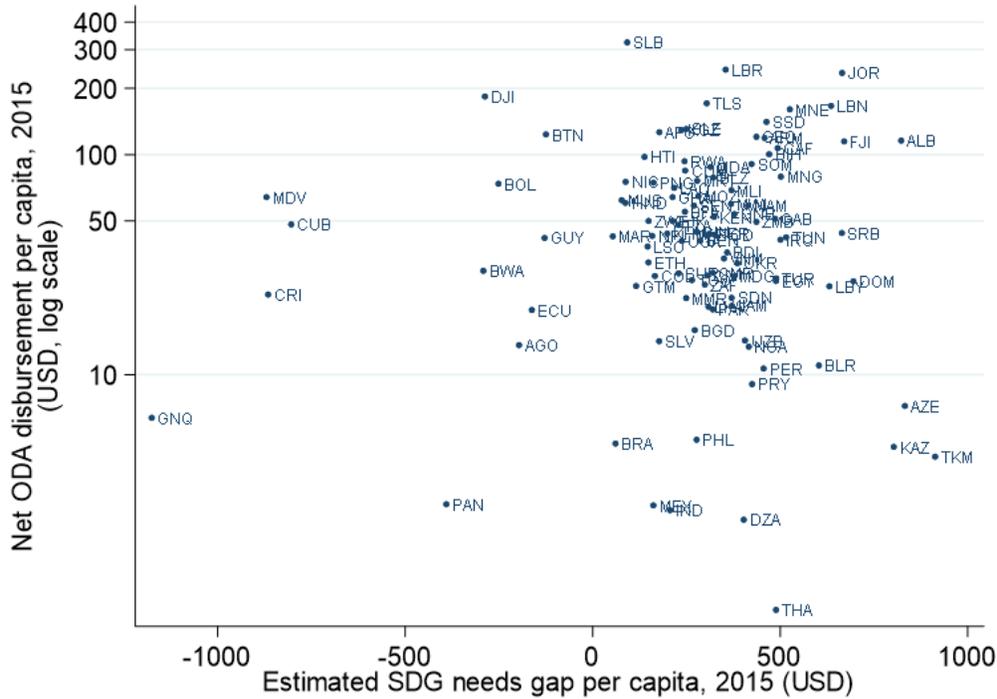
Note: Figure includes countries with populations of at least 300,000 people in 2015.
Source: Authors' calculations, based on World Bank (2019) and data sources described in Sections III and IV.

(iii) Non-concessional resources

A remaining consideration for countries is whether to borrow. One option in this regard is to mobilize market-priced non-concessional resources, taking advantage of the current (and potentially long-term) low levels of real interest rates. Left to themselves, many developing countries face high risk premia and short maturities in private capital markets that may make such borrowing unattractive, but there are increasing alternatives. Resources from the private sector can be intermediated through an official bilateral or multilateral financial institution that will typically offer better terms than the market, especially if the financing instrument is softened by a guarantee or other risk mitigation device. They can also be mobilized into projects, typically infrastructure, where risk is brought down to acceptable levels by the participation of an official lending institution.

The challenge, however, is that net non-concessional official flows tend only to be significant for a few countries with relatively small populations. Figure 9 shows the state of play as of 2015 for cross-border official non-concessional flows. Large emerging economies face a range of restrictions and are subjected to efforts to graduate them to private commercial capital markets instead. Given their current equity capital and conservative risk management practices, many official financial institutions do not currently make a very significant dent in the typical needs gap of developing countries.

Figure 9: Net official non-concessional financing per capita and GDP per capita, 2015
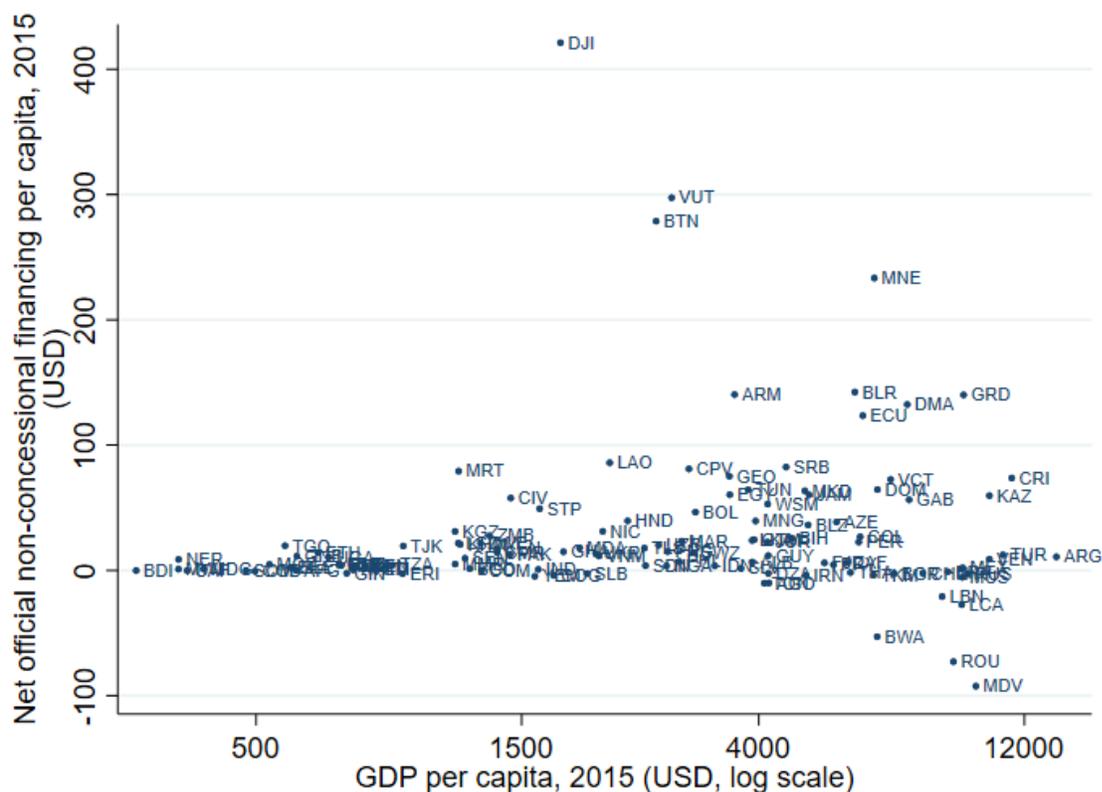
Source: World Bank (2019).

Fortunately, there is considerable potential for the official development finance institutions (DFIs) to do more in the future. Settimo (2019) estimates that proposed changes in the methodology used by S&P to rate multilateral development banks (MDBs) could unlock almost $1.4 trillion in additional multilateral exposure, if MDB shareholders also accept a higher risk tolerance associated with moving to a AA+ rating instead of a AAA rating. As MDBs can, in theory, also use their policy engagement, project identification, and financial instruments to mitigate and shift risk, they can use this additional balance sheet exposure to mobilize additional amounts of private finance, with the multiple potentially amounting to between 5-fold and 10-fold for each dollar of MDB exposure. Similarly, bilateral DFIs and national development banks also have a critical role to play.

VI. Implications and conclusions

In this paper, we argue that a new framing is required to build SDG-consistent economies. This entails ensuring universal access to basic services, building inclusive cities and industries that succeed on environmental terms, and retrofitting advanced economies' cities and industries that are falling short on SDG outcomes. While market actors will be crucial to many of these objectives, governments have foremost responsibility to ensure, among other things, that their public sector spending aligns with SDG outcomes. We stress from the outset that government spending does not guarantee SDG outcomes, but we nonetheless focus on public spending levels because many outcomes are constrained by lack of public resources. In that context, public sector spending and objectives are most usefully considered at the country-level.

To that end, a starting point for any SDG financing analysis should be to identify what countries are already spending on activities related to the SDGs. While this idea may seem obvious, we found it challenging to implement in practice. Government budget classifications do not readily map onto SDG targets and sector-specific international sources have their own country samples and reporting norms. While we made an effort to harmonize across sources, the data challenges imply that the results reported here are only indicative. Accordingly, our first recommendation is that the IMF be tasked with incorporating into its Government Finance Statistics best estimates of what governments are currently spending on the SDGs.

Our first key finding is that SDG-related public spending is already large, at $21.3 trillion globally in 2015. Moreover, we estimate that governments are on track to spend somewhere between $32.3 trillion and $33.6 trillion per year in 2030, if current trends on economic growth and spending hold up. Most of the absolute increase is likely to be generated in high-income countries and upper-middle-income countries. In lower-middle-income countries, SDG spending is likely to grow from $0.8 trillion per year in 2015 to $1.9 trillion in 2030, while in low-income countries the corresponding figures are likely to grow from $70 billion to $190 billion annually. The fact that annual global SDG spending is already on track to grow by more than $10 trillion over 15 years underscores the problems caused when framing the question of SDG financing as "how to mobilize trillions of aggregate global dollars for the SDGs." Instead, the key question is, "how to ensure the right resources are available in the right places to help solve the relevant problems."

In that vein, the fact that countries with higher incomes account for such a large amount of global SDG spending may surprise people who implicitly presume the SDGs are an issue only for poorer countries. But the SDGs represent a commitment by all countries to tackle their own issues at home while partnering with others on challenges abroad. No country is yet on track to achieve all the SDGs, so even high-income countries with high levels of per capita spending have a challenge. In their case, the issue is not simply to spend more; instead the priority needs to be to marshall targeted resources to reach populations in need and to generate creative outcome-oriented approaches to stimulating innovation.

We next compile estimates of SDG sector spending minimum needs in 134 low- and middle-income countries, drawn from previous expert assessments of 10 sectors. The underlying studies tend to use different approaches to defining needs, and we do not evaluate each of their technical merits here. Instead we make a best effort to draw from their respective insights. We make adjustments to avoid problems like double-counting between sources, while recognizing that the assessments also tend to assume "good" country performance in using resources.

By adding the sectoral estimates together for each country, our second key finding is that SDG spending needs have a "hockey stick" shape with respect to GDP per capita: a minimum threshold that averages around $350 per person per year for low-income countries, with some variation, and then rises steadily as per capita income rises. Even at similar income levels, some countries have very different SDG spending needs, reflecting many structural factors in their economies. This might be due to differences in income distribution, local disease burden, soil suitability for agriculture, exposure to droughts and floods, migration patterns, ease of access to trading partners, and so on. As incomes rise, there is no single common trend across sector spending, although social protection spending does seem to increase as a share of GDP at higher income levels.

By comparing spending trajectories with SDG needs, our third key finding pertains to each developing country's SDG needs gap, defined as the difference between projected SDG spending and minimum spending needs in 2025. Not surprisingly, most low-income countries show large needs gaps, and these generally shrink as a share of GDP as income levels rise. By the time an economy reaches a per capita income level of approximately $5,000-$6,000, the SDG spending needs are on the order of 20 to 30 percent of GDP. At this income level, many economies can typically rely substantially on domestic resources to meet their SDG needs. However, several upper middle-income countries show sizeable needs gaps too.

At the same time, 34 countries have no estimated needs gap in 2025. For example, we estimate that Ethiopia, Bolivia, Morocco, and China are likely to spend enough to meet minimum SDG needs if recent trends continue. In countries without needs gaps, the resulting priorities sit squarely on ensuring incentives and institutions are compatible with shifting towards an SDG economy, rather than trying to raise and spend additional money. The same logic likely holds for most high-income economies. When all the SDG needs gaps are added together across developing countries, we find the absolute aggregate volume of the gaps to be higher in lower-middle-income countries (total gap of $549 billion per year in 2025) compared to upper-middle-income countries ($223 billion gap) or low-income countries ($150 billion gap). The overall total needs gap adds up to more than $920 billion.

Our total gap figure is likely lower than other recent estimates for two reasons. One is that we identify a significant number of developing countries with no estimated needs gaps in 2025, rather than assuming a common average gap across similar countries. A second factor is that our main results are based on an assumption that countries increase their spending as their economies grow, implicitly backed by increases in DRM. We find a cross-sectional elasticity of SDG spending with respect to GDP per capita of approximately 1.13, so the process of economic growth might typically generate new resources that permit governments to spend more in per capita terms. Assuming this coefficient holds for country-level economic growth projections, it contributes roughly $80 billion of domestic resources across developing countries in 2025, with most of that generated in upper-middle-income countries and lower-middle-income countries.

To close their SDG needs gaps, many low-income, lower-middle-income, and upper-middle-income countries need to increase relevant public spending. Doing so will require a concerted plan to raise domestic and external resources that can address each country's specific needs gaps, rather than coarse

logic that buckets many countries together. Gaps might often need to be financed in a sector-specific manner.

For most countries, the first point of departure for financing more SDG public spending is to assess the potential for DRM. Beyond the endogenous DRM process we presume to take shape through economic growth, if countries make further effort to increase DRM by an additional 1 percentage point of GDP to address SDG needs gaps where they exist, this would generate another $163 billion toward the gap. However, only $6 billion of this DRM total would accrue in low-income countries, again underscoring the problem of considering global aggregates amid highly localized challenges. Lower-middle-income countries would accrue around $97 billion and upper-middle-income countries around $60 billion.

The next option for filling the needs gap is to consider official aid. As framing context, we note that if all OECD-DAC countries were to meet the 0.7 percent of GNI target for aid then this would generate approximately $200 billion of additional resources by 2025, which would be more than enough to close the SDG needs gap at least in low-income countries. Some middle-income countries, like small island states and heavily indebted countries, may not be creditworthy for large volumes of non-concessional finance. They still have unmet SDG needs, and should also be priorities for aid.

Our finding of large gaps in specific countries lends urgency to the process of replenishment of several large multilateral funds from now through 2020. During this period, eight significant agencies are approaching donors for resources to do more. They include the Global Fund to Fight AIDS, TB, and Malaria (replenishment recently concluded); the World Bank's International Development Association; the African Development Fund; GAVI, the Vaccine Alliance; the Green Climate Fund; the International Fund for Agricultural Development; the Global Partnership for Education; and the International Finance Facility for Education. Together, the "ask" is likely to exceed $70 billion over multiple years. But these requests are framed relative to historical pledges. They are not derived by asking how much would be needed to help solve specific SDG problems in specific countries. Absent careful bottom-up needs assessment by country and sector, it is impossible to evaluate whether the replenishments for these institutions are adequate for their headline institutional objectives – such as the end of extreme income poverty in the case of the World Bank. Decisions on the volume and allocation of aid should be made consistent with meeting the SDGs.

We also recognize that non-concessional external financing could be very helpful to finance the SDG needs gap in many low- and middle-income countries, especially for sustainable infrastructure investments. Multilateral institutions can likely play a far larger role. Some analysts believe these institutions could unlock trillions in additional non-concessional lending without any additional support from shareholders if they were permitted to act in a less risk-averse way. They can also help reduce risk to tolerable levels in low-income countries which presently access barely any non-concessional funding, despite the very high returns that many projects appear to offer.

For each low- and middle-income country, there is some combination of DRM buoyancy, increased official aid, and expanded multilateral non-concessional lending that could potentially fill its public financing needs for the SDGs. But these resource types are not full substitutes for each other. DRM and aid should preferably flow through government budgets, guided by transparent processes that respond to citizens' priorities. Non-concessional funds could be channeled partly through budgets and partly through special purpose vehicles and investment platforms that are also citizen-responsive while operationally adapted to partnerships with the private sector. In this regard, the 2018 report of the G20 Eminent Persons Group on the multilateral development banks recommended the establishment of "country platforms," especially for infrastructure, as new vehicles for effectively pooling and channeling blended finance in support of national development plans in specific sectors.

Understanding that different types of financing are suitable for solving different types of SDG needs can help in thinking through approaches to the allocation of finance. Traditionally, low-income countries have financed their spending through DRM and aid. But as indicated above, a large share of their SDG spending is for infrastructure, which is well-suited to non-concessional finance at current low levels of real interest rates. As long as infrastructure projects are well selected and implemented, they will improve country creditworthiness. Conversely, many middle-income countries have sizeable needs gaps in sectors that require recurrent, sustained financing, of the kind that DRM and aid can often best provide.

Importantly, aid is often the catalyst that smooths the way for other types of finance. Country platforms and other types of public-private partnerships require administration; policy reform requires data collection, diagnostics and advocacy; uptake of social services must be underpinned with technical assistance. Such expenditures cannot easily be funded by borrowed resources, so aid may have an important role to play even in middle-income countries. The upshot is that broad generalizations around financing should be replaced by granular country-level assessments by sector. DRM, aid, multilateral lending and private finance can all have a role to play in a country, but in different amounts and mixes, depending on the context.

This leads us to another recommendation. For many years, the dominant variable defining debates over aid allocation has been the recipient country's income level. We believe it is time to think afresh about what aid is for, and for aid allocations to be driven more directly by SDG needs and achievements. As the world economy has evolved, and many developing countries have experienced tremendous economic growth, the composition of priorities for international public resources has evolved. Moreover, policy debates too often take as given the envelope of international public resources (aid, non-concessional borrowing), and therefore focus attention either too narrowly on DRM or on a blithe assumption that the private sector can fill public sector gaps. Instead, debates should begin by asking what a public spending program to achieve the SDGs in each individual country would require, and from that starting logic develop a financing plan about the split between DRM, aid and non-concessional borrowing.

Resources alone, of course, are not sufficient to achieve the SDGs. They must be accompanied by appropriate policies, incentives and institutional frameworks. For this reason, we recommend more SDG-specific policy conversations, both within national governments and across international partner organizations. Programming debates should hinge on practical scenarios for eliminating extreme poverty and achieving universal basic services by 2030, among other SDG priorities. These and other objectives can be mapped against categories of potential financing, through, for example, an integrated national financing framework. In 2018, U.N. member states committed to operationalize this element of the Addis Ababa Action Agenda.

SDG achievement scenarios will inevitably need to embed major near-term investments in sustainable infrastructure to mitigate and adapt to climate change, which could yield even greater benefits over time. Rozenberg and Fay (2019), for example, argue that the lifetime costs of incorporating sustainability should not be higher than traditional infrastructure because of cost savings in operating expenditure (e.g. for renewals-sourced electricity) or from foregone emergency needs (e.g. investments in resilience) over a long-term horizon. Even though lifetime net benefits of sustainable infrastructure are positive compared to many traditional alternatives, the time profile of expenditures and costs is shifted towards the present, while that of returns is shifted out to the future, with adverse implications for traditional financing models and debt sustainability assessments. These models and assessments therefore also need to be reframed if sustainable infrastructure is to be properly considered.

Our principal recommendations – incorporating SDG spending into government financial accounting and reporting, reviewing international public finance volumes and allocations through an SDG needs lens, and adopting SDG-consistent integrated national financing frameworks – are urgently needed to provide a

sound analytical basis for guiding effective SDG public spending. A country needs-based approach to SDG financing should help to anchor or inform all major international financing meetings in 2020, such as the Annual Meetings of the IMF and World Bank, the Group of 20, and the U.N.'s financing for development deliberations.

Countries and their international partners should articulate and design a program to update and align the international finance system with the SDGs and to encourage implementation of SDG-anchored national frameworks. An appropriately crisp anchoring in SDG objectives will raise many practical operational issues, such as budget classifications, debt sustainability frameworks, country graduation strategies by sector, and regulatory incentives to promote SDG-aligned private finance. These need to be taken on by relevant national and international agencies. New approaches to international taxation of multinational companies, if agreed by the G20, could use SDG financing needs as a guidepost to assess whether the allocation rules are fair or not.

This paper's quantitative results should be interpreted as indicative rather than precise estimates. We would only encourage others to craft more refined approaches to estimating each country's current public spending and forthcoming budgetary needs for the SDGs. The nature of our results nonetheless helps to inform the practical framing around fiscal actions required to build SDG economies. When public needs gaps on the SDGs are considered by sector and country and then compared to trends and potential for new resources, the SDG financing problem appears tractable. High-income countries are already spending large amounts on the SDGs every year, and need to ensure their public resources are being appropriately targeted towards generating measurable results. Middle-income countries, show considerable likely progress and potential on DRM, although lower-middle-income countries face an especially sizeable challenge in mobilizing the required resources. Low-income countries show considerable scope for progress in DRM, while also demonstrating a major need for increased external support that is well within the bounds of existing international pledges.

A strong SDG agenda requires emphasis on both domestic and international results. As a positive sign of emergent norms, the 2020 European Union budgeting process has committed to focus on the SDGs. In that public financing forum and others, all parties need to show how burdens will be shared and how resources will be linked to SDG outcomes. With barely a decade left to deliver on the all-country agreements signed in 2015, nothing less is required in order to build the SDG economy.

References

Afzali, Sayed I. and Mohammad N. Timory. 2017. "The Game of Numbers: Analysis of the National Budget 2018." *Integrity Watch Afghanistan*.

Asian Development Bank. 2017. *Meeting Asia's Infrastructure Needs.* Manila: Asian Development Bank.

Desai, Raj M., and Homi Kharas. 2017. "Is a Growing Middle Class Good for the Poor?" *Brookings Global Economy and Development Working Paper 105.*

Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), and World Food Programme (WFP). 2015. *Achieving Zero Hunger: the critical role of investments in social protection and agriculture*. 2nd ed. Rome: FAO.

Food and Agriculture Organization Statistics Division (FAOSTAT). 2019. "Government Expenditure on Agriculture." http://www.fao.org/faostat/en/#data/IG (accessed: January 11, 2019).

Fund for Peace. 2015. "Fragile States Index 2015." http://fundforpeace.org/fsi/excel/ (accessed: February 28, 2019).

G20 Eminent Persons Group on Global Financial Governance. 2018. *Making the Global Financial System Work for All*. Washington, DC: Global Finance Governance.

Gaspar, Vitor, David Amaglobeli, Mercedes Garcia-Escribano, Delphine Prady, and Mauricio Soto. 2019. "Fiscal Policy and Development: Human, Social, and Physical Investment for the SDGs." *IMF Staff Discussion Notes No. 19/03*. January. Washington, DC: International Monetary Fund.

Global Partnership for Education. 2018. "Pledge by Papua New Guinea at GPE's 3rd replenishment." https://www.globalpartnership.org/content/pledge-papua-new-guinea-gpes-3rd-replenishment/ (accessed: February 22, 2019).

Government Spending Watch. 2015. *Financing the Sustainable Development Goals: Lessons from government spending on the MDGs*. London: Development Finance International Group; Washington, DC: Oxfam.

----------. 2019. "Spending Data." http://www.governmentspendingwatch.org/spending-data (accessed: January 31, 2019).

Hutton, Guy and Mili Varughese. 2016. "The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene." *World Bank Group Water and Sanitation Program: Technical Paper 103171*. January. Washington, DC: World Bank.

International Centre for Tax Development (ICTD) and United Nations University World Institute for Development (UNU-WIDER). 2019. "Government Revenue Dataset 2019." https://www.wider.unu.edu/project/government-revenue-dataset (accessed: June 5, 2019).

International Commission on Financing Global Education Opportunity. 2016. *The Learning Generation: Investing in education for a changing world*. New York, NY: The International Commission on Financing Global Education Opportunity.

International Food Policy Research Institute (IFPRI). 2015. "Statistics on Public Expenditures for Economic Development (SPEED)." https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/INZ3QK (accessed: January 11, 2019).

International Labour Organization (ILO). 2014. *World Social Protection Report 2014/15: Building economic recovery, inclusive development and social justice*. Geneva: ILO.

----------. 2017. "World Social Protection Report Data 2017-2019". https://www.ilo.org/gimi/gess/AggregateIndicator.action#expenditure/ (accessed: January 29, 2019).

International Monetary Fund (IMF). 2015. "Investment and Capital Stock Dataset (ICSD)." http://data.imf.org/?sk=1CE8A55F-CFA7-4BC0-BCE2-256EE65AC0E4 (accessed: February 5, 2019).

----------. 2019a. "Government Finance Statistics (GFS)." https://data.imf.org/?sk=5804C5E1-0502-4672-BDCD-671BCDC565A9 (accessed: June 13, 2019).

----------. 2019b. "World Economic Outlook Database." https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx/ (accessed: June 27, 2019).

Kharas, Homi, John W. McArthur, and Izumi Ohno. 2019. "Getting Specific to Leave No One Behind on Sustainable Development." In Homi Kharas, John W. McArthur, and Izumi Ohno (Eds.) *Leave No One Behind: Time for Specifics on the Sustainable Development Goals.* Washington, DC: Brookings Press. pp. 1-19.

Lustig, Nora, Jon Jellema, and Valentina M. Pabon. 2019. "Leaving No One Behind: Can Tax-Funded Transfer Programs Provide Income Floors in Sub-Saharan Africa?" In Kharas, McArthur, and Ohno (Eds.) *Leave No One Behind: Time for Specifics on the Sustainable Development Goals.* Washington, DC: Brookings Press. pp. 169-206.

Manuel, Marcus, Clare Manuel and Harsh Desai. 2019. "Universal access to basic justice: Costing Sustainable Development Goal 16.3." *Overseas Development Institute Working Paper* 554. April. London: Overseas Development Institute.

Manuel, Marcus, Harsh Desai, Emma Samman, and Martin Evans. 2018. *Financing the end of extreme poverty.* London: Overseas Development Institute.

McCarthy, Donal P., Paul F. Donald, Jörn P. W. Scharlemann, Graeme M. Buchanan, Andrew Balmford, Jonathan M. H. Green, Leon A. Bennun, Neil D. Burgess, Lincoln D. C. Fishpool, Stephen T. Garnett, David L. Leonard, Richard F. Maloney, Paul Morling, H. Martin Schaefer, Andy Symes, David A. Wiedenfeld, and Stuart H. M. Butchart. 2012. "Financial Costs of Meeting Global Biodiversity Conservation Targets: Current Spending and Unmet Needs." *Science.* Vol. 338, Issue 6109: 946-949.

Organisation for Economic Co-operation and Development (OECD). 2017. "National Accounts Statistics." https://data.oecd.org/gga/general-government-spending.htm (accessed: February 8, 2019).

Rozenberg, Julie, and Marianne Fay, eds. 2019. *Beyond the Gap: How Countries Can Afford the Infrastructure They Need While Protecting the Planet*. Washington, DC: World Bank.

Sachs, Jeffrey D, Vanessa Fajans-Turner, Taylor Smith, Cara Kennedy-Cuomo, Teresa Parejo, and Siamak Sam Loni. 2018. *Closing the SDG Budget Gap*. Copenhagen: Move Humanity; Paris and New York, NY: Sustainable Development Solutions Network.

Sachs, Jeffrey D, Gordon C McCord, Nicolas Maennling, Taylor Smith, Vanessa Fajans-Turner, and Siamak Sam Loni. 2019. "SDSN Costing and Financing for Low-Income Developing Countries." Sustainable Development Solutions Network.

Schmidt-Traub, Guido. 2015. "Investment Needs to Achieve the Sustainable Development Goals: Understanding the Billions and Trillions." *Sustainable Development Solutions Network Working Paper,* Version 2. November. Paris and New York, NY: Sustainable Development Solutions Network.

Schmidt-Traub, Guido, and Jeffrey D. Sachs. 2015. "Financing Sustainable Development: Implementing the SDGs through Effective Investment Strategies and Partnerships." *Sustainable Development Solution Network Working Paper*. April. Paris and New York, NY: SDSN.

Settimo, Riccardo. 2019. "Higher Multilateral Development Bank Lending, Unchanged Capital Resources and Triple-A Rating. A Possible Trinity after All?" *Bank of Italy Occasional Paper* No. 488. April. Rome: Bank of Italy.

Stenberg, Karin, Odd Hanssen, Tessa T. Edejer, Melanie Bertram, Callum Brindley, Andreia Meshreky, James E. Rosen, John Stover, Paul Verboom, Rachel Sanders, and Agnès Soucat. 2017. "Financing transformative health systems towards achievement of the health Sustainable Development Goals: a model for projected resource needs in 67 low-income and middle-income countries." *The Lancet Global Health*. Vol 5, Issue 9: PE875-E887.

United Nations. 2015a. "Addis Ababa Action Agenda of the Third International Conference on Financing for Development." Resolution endorsed by the General Assembly 69/313. July 27. (https://sustainabledevelopment.un.org/content/documents/2051AAAA_Outcome.pdf)

----------. 2015b. "Transforming Our World: The 2030 Agenda for Sustainable Development." Resolution adopted by the General Assembly A/RES/70/1. September 25. Published October 21. (https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E)

United Nations Conference on Trade and Development (UNCTAD). 2014. *World Investment Report 2014: Investing in the SDGs: An Action Plan*. Geneva and New York, NY: UNCTAD.

United Nations Department of Economic and Social Affairs (UN-DESA). 2019. *United Nations World Public Sector Report 2019: Sustainable Development Goal 16: Focus on public institutions*. New York, NY: UN-DESA.

United Nations Statistics Division (UNStats). 2018. "National Accounts Official Country Data." http://data.un.org/Data.aspx?d=SNA&f=group_code%3A301 (accessed: June 13, 2019).

Waldron, Anthony, Arne O. Mooers, Daniel C. Miller, Nate Nibbelink, David Redding, Tyler S. Kuhn, J. Timmons Roberts, and John L. Gittleman. 2013. "Targeting global conservation funding to limit immediate biodiversity declines." *Proceedings of the National Academy of Sciences* 110 (29): 12144-12148

World Bank. 2013. *Capital for the Future: Saving and Investment in an Interdependent World.* Global Development Horizons. Washington, DC: World Bank.

----------. 2014. *Sudan State-level Public Expenditure Review: Meeting the Challenges of Poverty Reduction and Basic Service Delivery Volume 2 – Background Papers*. May. Washington, DC: World Bank.

----------. 2018. *Investing in Human Capital for Nigeria's Future*: *Nigeria Biannual Economic Update.* Washington, DC: World Bank.

----------. 2019. World Development Indicators database. http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators (accessed: October 10, 2019).

World Data Lab. 2019. "World Poverty Clock.". https://worldpoverty.io (accessed: March 14, 2019).

World Health Organization (WHO). 2017. "Global Health Observatory data repository." http://apps.who.int/gho/data/view.main.GHEDGGHEDGDPSHA2011v (accessed: January 11, 2019).

Xinhua News Agency. 2016. "China's national fiscal education funds accounted for more than 4% of GDP for four consecutive years," news release. November 10. http://www.gov.cn/shuju/2016-11/10/content_5131034.htm.

Appendix

Table A1: Data sources for estimation of SDG-related public spending

Sector	Indicator Name	Unit	Source
Social spending	Public social protection expenditure, excluding health, latest available year	% of GDP	ILO (2017)
	* Public social protection (excluding health care)	% of GDP	ILO (2014)
Agriculture	Agriculture, forestry, fishing (General government)	LCU	FAOSTAT (2019)
	General government total expenditure on agriculture	% of GDP	IFPRI (2015)
	* Planned government spending on agriculture	% of GDP	Government Spending Watch (2019)
	* Agriculture expenditure	% of total expenditure	World Bank (2014)
Health	Domestic general government health expenditure	% of GDP	WHO (2017)
Education	General government expenditure on education	% of GDP	World Bank (2019)
	* Total government investment in education	LCU	Xinhua News Agency (2016)
	* Public spending on education	% of GDP	World Bank (2018)
	* Public expenditure on education (recurrent and capital)	LCU	Global Partnership for Education (2018)
Infrastructure	General government investment (gross fixed capital formation)	2011 PPP	IMF (2015)
	General government spending on defence (gross fixed capital formation)	LCU	OECD (2017)
	* General government spending on defence (gross capital formation)		
	* Infrastructure budget allocation in 1397 national budget proposal	LCU	Afzali et al. (2017)
Biodiversity conservation	Average annualized total of all spending flows across the years 2001-2008	2005 USD	Waldron et al. (2013)
Justice	General government expenditure on public order & safety	% of GDP	IMF (2019a)
	* Government final consumption expenditure on public order and safety at current prices	LCU	UNStats (2018)

* indicates supplementary source used for missing observations within primary source

Table A2: Data sources for estimation of SDG-related minimum public spending needs in 2025

Sector	Indicator Name	Unit	Source
Social spending, with emphasis on ending extreme income poverty	Poverty gap per capita, under $1.90 dollars a day	2011 PPP	World Data Lab (2019)
	Public social protection expenditure, excluding health, latest available year	% of GDP	ILO (2017)
Agriculture and rural development, with emphasis on achieving zero hunger	Average annual economy wide additional rural investments in the Zhbotmea scenario, 2016-30	2013 USD	FAO (2015)
	Additional public rural investment on improving infrastructure by region	2013 USD	
	Public spending on agriculture	2015 USD	Authors' estimation of baseline spending, sources described in Appendix Table A1
Health	Estimated additional resource needs: Modeled general government health expenditure total cost per person 2030 (GGHE)	2014 USD	Stenberg et al. (2017)
	* Physicians density	per 1000 population	WHO (2017)
	* Nursing and midwifery personnel density	per 1000 population	
	* Births attended by skilled health personnel	%	
	* Fragile States Index 2015 (C1: Security Apparatus + E1: Economy + Ps: Public Services + S1: Demographic Pressures + X1: External Intervention)	-	Fund for Peace (2015)
Education	Costing and illustrative financing plan for the Learning Generation: Domestic public, avg. 2015-2030	% of GDP	International Commission on Financing Global Education Opportunity (2016)
	Costing and illustrative financing plan for the Learning Generation: International finance of which DAC ODA, avg. 2015-2030	% of GDP	
Water and sanitation	Annual costs of basic water, sanitation and hygiene (capital, capital maintenance and operations)	2015 USD	Hutton and Varughese (2016)
	Planned government spending on water and sanitation	% of GDP	Government Spending Watch (2019)
Energy	Infrastructure spending needs in low and middle income countries for the energy sector, capital and maintenance, 2015-2030 (Scenario: Preferred)	% of GDP	Rozenberg and Fay (2019)
	Public spending on energy, 2011	% of total infrastructure investment	
Transportation	Infrastructure spending needs in low and middle income countries for the transportation sector, capital and maintenance, 2015-2030 (% of GDP) (Scenario: Preferred)	% of GDP	Rozenberg and Fay (2019)
	Public spending on transportation, 2011	% of total infrastructure investment	

| Flood protection	Infrastructure spending needs in low and middle income countries for the flood protection sector, capital and maintenance, 2015-2030 (Scenario: Preferred)	% of GDP	Rozenberg and Fay (2019)
	Public spending on flood protection, 2011	% of total infrastructure investment	
Biodiversity conservation	Total investment required by income group	2012 USD	McCarthy et al. (2012)
Access to justice	Universal basic justice costing framework - main components ($ per person per year)	2013 USD	Manuel et al. (2019)

* indicates supplementary source used for missing observations within primary source

Table A3: Estimated aggregate 2025 SDG needs gap, by country income group, when spending fixed as share of GDP

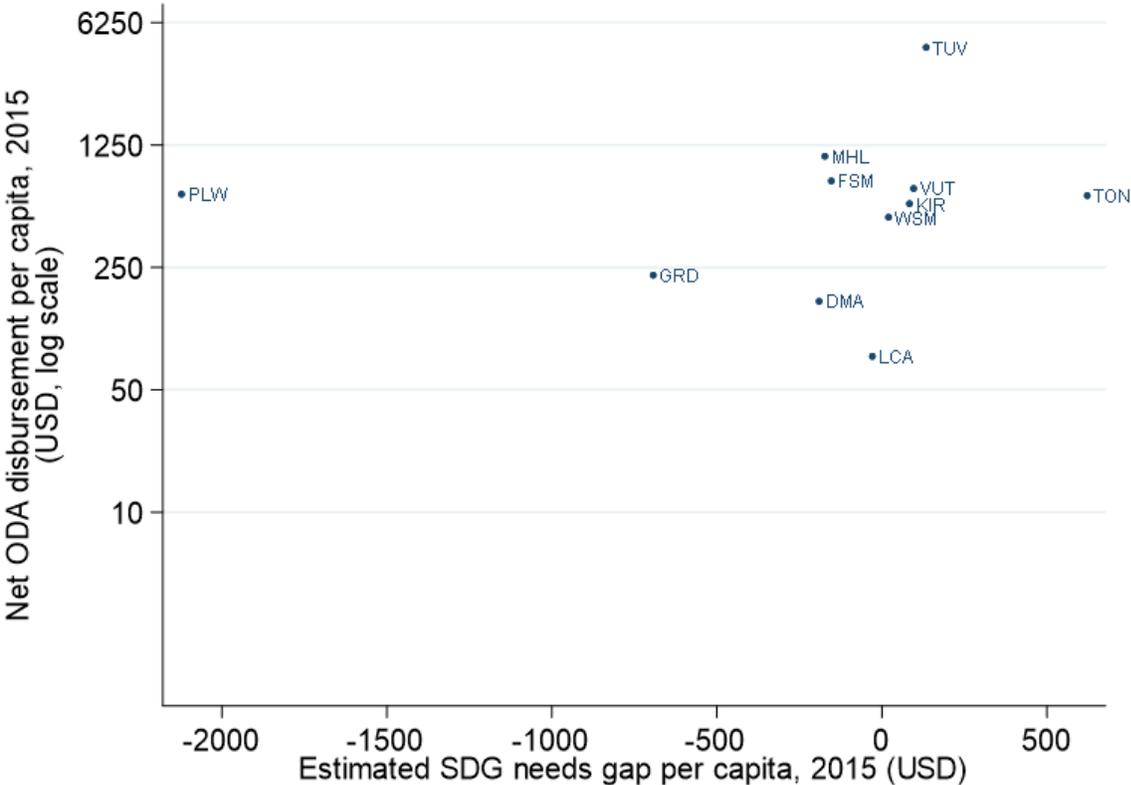| Income Group	SDG needs gap
Low	$152 bn
Lower-middle	$607 bn
Upper-middle	$246 bn
TOTAL	**$1,005 bn**

Source: Authors' calculations, based on World Bank income classifications for 2015 and data sources described in Sections III and IV.

Figure A1: Net ODA disbursement and GDP per capita, 2015, in countries with population less than 300,000
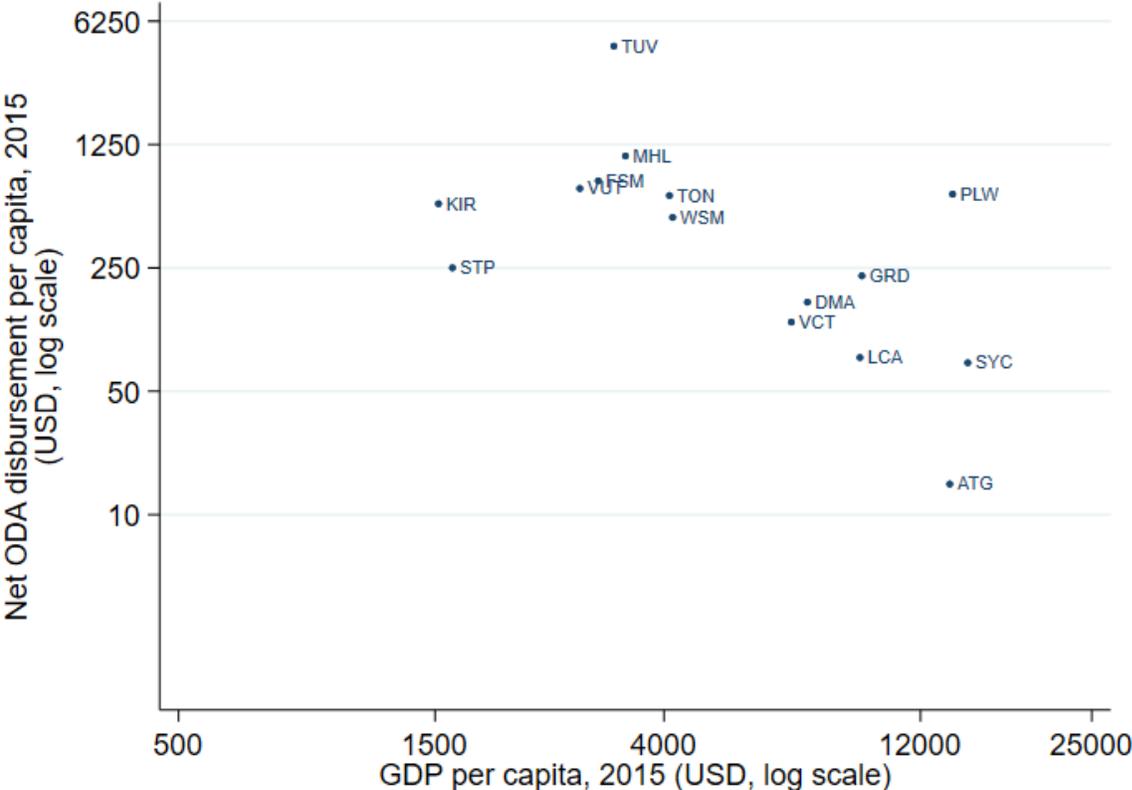
Source: World Bank (2019)

Figure A2: Net ODA disbursement and estimated SDG needs gap per capita, 2015, in countries with population less than 300,000

Source: Authors' calculations, based on World Bank (2019) and data sources described in Sections III and IV.