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Tax expenditures and progress to the Sustainable Development Goals

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Abstract

This study reports the impact of governments having additional revenue equivalent to tax expenditures on achieving the Sustainable Development Goals in 97 countries. The study draws data on revenue foregone from the Global Tax Expenditure Database. To analyze the potential of an increase in government revenue equivalent to the revenue foregone, the study uses the Government Revenue and Development Estimations modeling. The study finds that if governments had additional revenue equivalent to tax expenditures: an additional 17 million children would attend school (13.62% currently out of school), an additional 70 million people would use basic water (23% of those without access), 146 million would use basic sanitation (20% of those without access), 181,000 children would survive (13% of children who currently die), and 12,000 mothers would survive (16% of mothers who currently die). Critically, there would be improvements in governance indicators in all regions. Foregone revenue from tax expenditures could increase access to public services for millions, which is the most effective tool for reducing inequality and driving progress toward sustainable development. The massive opportunity costs reported here require all governments to report and justify their annual tax expenditure.

KEYWORDS

access to services, fiscal redistribution, government effectiveness, government revenue, social spending, Sustainable Development Goals (SDGs), tax expenditures

1 | INTRODUCTION AND BACKGROUND

The ambitions of the 2030 Agenda for Sustainable Development, adopted in 2015, are laid out in 17 goals called the Sustainable Development Goals (SDGs). The SDGs take a holistic approach to health and well-being and provide a roadmap for reducing poverty and inequality by promoting global partnerships. Among these goals are the right to education, health, and the pursuit of economic growth, while also aiming to tackle the climate crisis (United Nations, 2022). Although considerable progress has been made since the implementation of the agenda in 2015, the COVID-19 pandemic, conflicts, and escalating climate crisis have derailed SDG progress (The United Nations Department of Economic and Social Affairs, 2022). To get the SDGs back on track, governments in all countries, especially low- and lower middle-income (hereafter lower income) countries, must significantly increase their domestic fiscal space. Governments have several options, including broadening the tax base and increasing tax rates. In addition to reducing the use of exemptions and closing loopholes, rationalizing tax expenditures is an avenue for increasing tax revenue collection (Maier & Ricci, 2024).

Tax expenditure is an umbrella term that includes any deviation from the benchmark system by granting taxpayers preferential tax treatment (Redonda, 2016). Tax expenditures may be limited to specific geographic locations (e.g., tax-free zones) or time spans (e.g., tax holidays) and may also vary by sector (Fuest & Riedel, 2012). In recent years, they have become popular because they are more convenient to implement compared with subsidies and grants, and other tools geared at easing the cost of doing business for investors (Mataba et al., 2023).

Governments offer taxpayers preferential tax treatment to achieve various policy objectives. These objectives may include promoting economic growth, creating employment, encouraging technology transfer, fulfilling social welfare obligations, or incentivizing certain behaviors (von Haldenwang et al., 2021). Delivery mechanisms include tax holidays, exemptions, reduced rates, deductions, tax allowances on investments, and tax liability deferrals (Mataba et al., 2023). Tax incentives can be granted for all tax types, including corporate income, personal income, value-added taxes, and excise taxes. Tax expenditures may target specific sectors and have clear policy objectives, generally social, economic, or environmental. They cover many beneficiaries, including households, businesses, and geographic areas (Redonda, 2016). Therefore, tax expenditures—depending on the targeted beneficiaries and sectors, the policy objectives, their design, and the efficiency of implementation—will have different impacts (both positive and negative) on a country's economic growth and development strategies, and thus on the SDGs (Mataba et al., 2023; Redonda, 2016).

On the one hand, some experts consider tax expenditures unnecessary, inefficient, and ineffective and believe that they create complex tax structures that provide opportunities for tax abuse (Mataba et al., 2023; Zolt, 2014). Such incentives may not be the highest priority for investors and may not contribute to attracting investments. However, they erode government revenue and effectiveness, further undermining the government's ability to provide an attractive investment environment. Therefore, in some cases, they undermine good governance and drive inequality (Padilla et al., 2020). Critically important, tax expenditures drive the race to the bottom in international tax competition, and the impact is especially felt in lower income countries, which derive a much more significant proportion of their revenue from corporate taxes (International Monetary Fund, 2014; Mataba et al., 2023). When one country offers a firm a tax incentive to locate in its country, it may benefit that country, but it may also harm the country in which the firm would otherwise locate. There is no net benefit, but an overall loss. Tax expenditure on investments reduces both tax bases and rates in Asia, supporting the widely held belief that they drive tax competition among countries (Padilla et al., 2020).

Tax expenditures are less explicitly integrated into budgets than other government spending and are potentially susceptible to lobbying influences. Furthermore, many have concerns regarding their fiscal costs (Eissa et al., 2021). Stausholm has shown that tax expenditure is associated with a reduction in spending, sluggish outcomes in the health and education sectors, and school enrolment rates (Stausholm, 2017). While foregone revenue receives the most attention, possibly because it can be quantified with relative ease, other opportunity costs include administrative costs and the potential for corruption (Padilla et al., 2020). Additional considerations encompass the broader societal role of taxation, which includes aspects of redistribution and representation (The Tax Justice Network, 2021).

On the other hand, tax expenditure may be associated with benefits, including job creation, increased competitiveness, revenue generation, and increased gross investment (Carbonnier et al., 2022; Kronfol & Steenbergen, 2020; Mataba et al., 2023). However, it takes a long time to reap benefits, and other exogenous factors make it difficult to isolate the benefits attributable to tax incentives, posing a challenge to evaluating their effectiveness (Kronfol & Steenbergen, 2020). Methods to estimate potential benefits, such as Return on Investment (ROI) and sectoral regression analyses and investor motivation surveys, are time-consuming, less robust, and susceptible to biased responses (Kronfol & Steenbergen, 2020).

This study aims to estimate the gains in terms of the SDGs of additional government revenue equivalent to tax expenditures, with the goal of enhancing progress on the 2030 Agenda for Sustainable Development. By evaluating the opportunity costs of tax expenditures, in terms of foregone spending and its implications for SDG progress, this study provides a novel approach. It explores how additional fiscal resources would support critical areas, including public services and government effectiveness. Through this analysis, we offer evidence-based insights for policymakers to redesign tax expenditures in a way that directly contributes to achieving SDG targets, particularly in lower income countries, where the need for fiscal space and efficient public spending is most acute.

The remainder of this paper is organized as follows. Section 2 reviews the literature on the impact of government revenue and tax expenditure on SDG progress, acting via different paths. Section 3 outlines the study's hypothesis. Section 4 describes the data and the methods used in this study. The results, including the limitations of this study, are presented in Section 5. Section 6 discusses the findings and proposes policy options for tax expenditures with respect to SDG progress and concludes the paper.

2 | TAX EXPENDITURES AND SDG PROGRESS

There is a clear relationship between a country's wealth and its SDG progress. However, increased wealth only affects social outcomes if it is spent on goods that promote social progress and redistribution. For example, in lower income countries, research has shown that 80% of the reduction in child and maternal mortality between 1990 and 2010 was due to improvements in public services (Bishai et al., 2016; Kuruvilla et al., 2014). Thus, most of the reduced mortality was due to efficient social spending, which depends on revenue, but also on the broader role of tax in society, including redistribution, representation, and good governance, which contributes to optimal regulation and repricing, sometimes described as the four Rs of taxation (The Tax Justice Network, 2021).

2.1 | Tax expenditures and fiscal redistribution

Redistribution is critical for SDG progress. Fiscal redistribution is defined as the process by which a state collects revenue and spends on public services, cash transfers, and price subsidies. The "virtual income" provided by public services is absolutely key to reducing inequality (Seery, 2014). For example, in a study of 29 low-income and middle-income countries, government spending on education and health reduced inequality (Lustig, 2018). A fiscal incidence study analyzes how taxes and benefits impact an individual or household and involves taking account of all taxes, including direct taxes (personal income tax and social security contributions), indirect taxes (value-added taxes, taxes on goods, and excise taxes), user fees, and all transfers from the state, such as cash transfers, school feeding programs, indirect subsidies, for example, on energy and in-kind transfers, such as free education and healthcare. One fiscal incidence study, which included seven lower income countries in Africa, showed that fiscal policy causes fiscal impoverishment, where the prefiscal (before taxes and transfers) poor get poorer among 10%–50% of the population. Total transfers amount to <10% of the taxes paid (fiscal exchange) and are mainly indirect, usually regressive, taxes. Further transfers are mostly subsidies (72%–100%), which benefit the better-off (Lustig et al., 2017).

Tax expenditures reduce the fiscal space for redistribution. On the other hand, households are beneficiaries of a large percentage of tax expenditure, which is likely to have social objectives. However, this trend is mainly observed in wealthier regions. Furthermore, many tax expenditures, even those with a social policy objective, have a regressive effect, and the opportunity costs of foregone revenue for public services must be balanced with the benefits of these tax expenditures. In the 1980s, in the United States and Europe, the publication of budgets for tax expenditures was introduced; however, those for social purposes were often exempt, and the increased use of tax expenditures and decreased use of state social spending have been a political choice for the last 40 years. These tax expenditures affect the public/private mix in a country's welfare regime by supporting the private or third-sector provision of public services, which benefits and incentivizes the market or third-sector provision of services (Branco & Costa, 2019). A European study in which tax expenditures were often used to support health, housing, education, and pensions showed that they are generally regressive. For instance, housing tax expenditures favor mortgage repayments over renters (Barrios et al., 2020). Similarly, in the United States, tax expenditures supported wealthier homeowners, while providing no support for renters (Rose, 2015). In an EU study, abolishing housing tax expenditure reduced inequality. Equally, education and health expenditures favor working-age individuals in the upper half of the income distribution in most European countries (Barrios et al., 2020). One study in Portugal, where tax expenditures for out-of-pocket health expenditure predominate, showed that four in every 10 families could not benefit because they did not earn enough to pay income tax, and that the poorest decile received 6% of the expenditures, while the wealthiest received 27% (Branco & Costa, 2019).

2.2 | Tax expenditures and revenue

Globally, the share of total tax expenditure attributed to corporate income tax was 16% in 2021, increasing to 20% in lower middle-income countries. The share of total revenue forgone from tax expenditures attributable to businesses varies by region, with North America having the lowest expenditure (see Figure 2). Investment tax expenditures are often used to attract foreign direct investment (FDI), and different regions of the world use different mixes of tax expenditures (Padilla et al., 2020). High-income countries tend to offer more cost-based expenditures, which are more likely to attract new investments, whereas African countries grant more profit-based tax expenditures and rely on special economic zones and tax holidays (Meinzer et al., 2019). Tax expenditure for investments has a considerable opportunity cost; an increase of 10% in corporate tax expenditure reduces corporate tax revenue by 0.35% of the gross domestic product (GDP), which would be 5% of government revenue in a country with a tax-to-GDP ratio of 15%, which is common in low-income countries (Meinzer et al., 2019).

The World Bank Report (2020) on 'Evaluating the Costs and Benefits of Corporate Tax Incentives' (Kronfol & Steenbergen, 2020), which surveyed investors around the world, found that other factors, including market opportunities and the general investment climate, often take precedence over expenditures (Bolnick, 2004; Kronfol & Steenbergen, 2020; Meinzer et al., 2019). Indeed, tax expenditures operate better in nations with improved infrastructure, affordable transportation, and investment-friendly regulatory environments (Kronfol & Steenbergen, 2020; United Nations Department of Economic and Social Affairs & Inter-American Center of Tax Administrations, 2018). There are examples in which tax expenditures for investment are redundant and investors would still invest in their absence (IMF et al., 2015; Stausholm, 2017). Others report that investment tax expenditures are poorly designed and have little impact on investment (Redonda et al., 2019), undermine public finances, and raise administrative costs, while it is difficult to quantify and isolate their impact on FDI (Meinzer et al., 2019; United Nations Department of Economic and Social Affairs & Inter-American Center of Tax Administrations, 2018).

3 | TAX EXPENDITURES AND REPRESENTATION/GOVERNANCE

Tax expenditures may undermine governance, because they undergo less scrutiny than budgets and may not be reviewed annually (Barrios et al., 2020). The lack of transparency in publishing tax expenditure costs provides a breeding ground for governments to pursue measures that are neither cost-effective nor aligned with nations' stated development goals (Bolnick, 2004). Furthermore, tax expenditures complicate the tax system because they introduce opacity, complexity, and a distorted treatment of taxpayers and commodities, whereby they tax some and exempt others (Bolnick, 2004). Complex rules, unclear laws, and regulations permit officials to use discretionary

powers that introduce corruption into the system (Ajaz & Ahmad, 2010). This creates a favorable prerequisite for corruption, which, if exploited, can be used to fund political parties and control economic elites (Moore, 2015). Indeed, the driving force behind some tax expenditures is personal gain, which brings no benefit in terms of tax revenue. Furthermore, additional government revenue has been shown empirically to improve governance indicators, and losses from government resource envelopes will result in poorer governance (Hall & O'Hare, 2023).

3.1 | The administration of tax expenditures

The administration of tax expenditures diverts crucial human resources from the core tasks of revenue collection: filing, return processing, payment, and auditing (Bolnick, 2004). Tax expenditures require the careful monitoring of beneficiaries to safeguard objectives and mitigate fraud. Such monitoring requires human and financial resources and administrative capacity, which may be inadequate in many countries (Celani et al., 2022). Furthermore, the process may lack objectivity, as officials who design tax expenditures are often involved in processing applications and monitoring implementation. For example, to diversify the economy from agriculture, the Government of Malawi offers tax expenditures to boost tourism (Malawi Revenue Authority, 2022). This means that the revenue authority bears the cost of verification (e.g., by hiring surveyors) to confirm the appropriate use of expenditures, and the process involves high-level approval from the Minister and Commissioner of the Revenue Authority (Nsiku, 2012). Tax expenditures also reduce compliance and tax morale. For example, a Kenyan study showed that taxpayers who are satisfied with the government's provision of services (fiscal exchange) are more likely to be compliant, and a reduction in tax expenditures increases compliance (Oguso & Sila, 2019).

However, progress has been made in reporting tax expenditures and their associated costs partly because of the efforts of several multilateral institutions. The Organization for Economic Co-operation and Development (OECD) produced a short note on the "Principles to enhance the transparency and governance of tax expenditures for investment in developing countries" and recognized the efforts that began with the IMF, OECD, the United Nations (UN), and the World Bank in 2011 to promote governance through transparent reporting (OECD, 2014). In a joint effort with ActionAid in 2015, the Tax Justice Network Africa published the cost of tax expenditures in East and West Africa (Meinzer et al., 2019). Launched in June 2021 by the Council on Economic Policies and the German Institute of Development and Sustainability, the Global Tax Expenditures Database (GTED) collates data on tax expenditures in 106 countries, although there is still a gap of 112 nonreporting countries. It aims to contribute to improving transparency, analysis, and policy debates on the costs and benefits of tax expenditures (von Haldenwang et al., 2022). Coupled with other initiatives, such initiatives are a path to improving the governance of tax expenditure (Redonda et al., 2019).

4 | STUDY HYPOTHESIS

We hypothesize that if governments had increased revenue equivalent to the revenue foregone from tax expenditures, this would increase government revenue, improve governance, and contribute to SDG progress. Thus, our aim is to analyze the potential for governance and SDG progress if governments had an increase in revenue equivalent to the revenue that was foregone because of tax expenditures. We acknowledge that we only have detailed data on foregone revenue as reported by governments, and we do not have the data to compare with the counterfactual, that is, the SDG progress attributable to tax expenditures.

5 | DATA AND METHODS

5.1 | The GTED

The GTED was the first database to record tax expenditures, as reported publicly by governments worldwide. It includes 218 nations, 106 of which have published at least some data since 1990, 112 of which are classified as nonreporting, and 24,128 individual provisions covering 33 calendar years. The GTED provides revenue-foregone estimates using different information categories, such as the type of tax, policy objective, beneficiaries, and type of tax expenditure (Redonda, 2016).

5.2 | The government revenue and development estimations

To analyze the potential of an increase in government revenue equivalent to the revenue foregone as a result of tax expenditures, we use Government Revenue and Development Estimations (GRADE) (version 3.8.3) (O'Hare et al., 2020). The GRADE is based on econometric models of the relationship between government revenue, quality of governance, and coverage of critical determinants of health, which are among the SDGs. The model is based on a series of panel data models covering most countries in the world over the period 1980–2020 (this is an unbalanced panel because many countries do not have complete data for the entire period) (Hall, Illian et al., 2021; Hall, Lopez et al., 2021; Hall & O'Hare, 2022; O'Hare & Hall, 2022).

The baseline data used in the GRADE model, such as the current revenue as a share of GDP, were sourced from the 2023 Government Revenue Database (UNU-WIDER, 2022), indicators of the quality of governance from the Worldwide Governance Indicators (Kaufmann & Kraay, 2020), coverage of water and sanitation (the percentage of the population with access to basic and safely managed water and sanitation), and child and maternal survival data from the World Bank World Development Indicators database (World Bank Group, 2021), see Table A3 in the Appendix for definitions. Government revenue and school attendance were modeled using baseline out-of-school data

from the UNESCO VIEW dataset (UNESCO Institute for Statistics and the Global Education Monitoring, 2024), and the baseline school-age population was taken from the UNESCO Institute for Statistics (UIS) (UNESCO Institute for Statistics (UIS), 2024).

The basic model for each sector follows a similar nonlinear structure in the following form:

$$(Y_i) = \frac{1}{(1 + e^{-((\alpha + \chi w)(\log(GR) - (\beta + \delta w)))})}, \quad (1)$$

where Y_i is the particular variable being modeled, GR is government revenue, ω is a vector of indicators of the quality of governance in each country in each time period, and α, χ, β, and δ are parameters to be estimated. This nonlinear function was selected to mimic the trajectory of many real-world social and economic development indicators. That is, when a country is in the very early stages of development, an increase in government revenue has little effect on the dependent variable. As development increases there comes a period of rapid improvement in the coverage of the dependent variable. However, as development continues, there is then a period of decreasing returns until near saturation is reached, and further increases in government revenue produce very little improvement in this indicator. This function gives a broadly "S" shaped curve and is called a logistic function. The actual shape and location of the curve are governed by the four estimated parameters for each country, which allows the quality of governance variables to play an important role in the observed differences between countries.

In addition to the SDGs, the GRADE model has a set of similar equations for the quality of governance indicators. These follow a similar functional form and allow for the possibility that, generally, as economies become richer, governance quality also improves. This allows for important positive feedback, where an increase in government revenue not only directly improves the SDGs but also improves governance, which in turn further improves the SDGs.

Worldwide Governance Indicators include Control of Corruption, Government Effectiveness, Voice and Accountability, Political Stability, Rule of Law, and Regulatory Quality, ranging from -2.5 to $+2.5$. We analyzed the six indicators and presented the improvement in two of these indicators, Control of Corruption and Government Effectiveness, as these do the most work in the models and are most impacted by increases in government revenue, see Table A3 in the Appendix for the definitions of these governance indicators.

In studying the SDGs and additional government expenditures, one could assume that the entire increase in revenue will be spent on a particular activity (such as a vaccination program). This is unrealistic, as a government will have many competing demands and will not normally devote extra revenue to a single goal. The underlying assumption in the GRADE model is that any increase in government revenue is allocated across all forms of government revenue in a manner similar to historical allocations. Therefore, access to all SDG indicators increases because of the increase in government revenue. We believe this assumption is more realistic.

Thus, the model translates the impact of an increase in revenue on governance and the progress of SDGs. If government revenue changes, the model shows the change in the coverage of water, sanitation, child school years, and survival as a percentage. Population data (World Development Indicators) from each country and year were used to convert the change in percentage coverage into the number of people who will have access to these SDG indicators and the number of children and mothers who survive. Since an increase in revenue takes time to show impact, for example, it takes time to train teachers and improve infrastructure, the model assumes that it takes 5 years for an increase in revenue to impact outcomes, which then gradually plateaus over the longer term.

To gauge the potential of an increase in government revenue in each country by curtailing tax expenditures, we did not make any judgments about the beneficiary or policy objective. Rather, we analyzed all tax expenditures with respect to the opportunity costs of foregone revenue and the SDGs. We used the average tax expenditure for the years 2017–2020, as these were the years with data for most countries (>90 countries in each of these years), expressed as a percentage of tax revenue. The increase in government revenue equivalent to the forgone revenue is entered into the GRADE model over the longest possible time (generally 2002–2020) because the impacts of improved revenue and important feedback on governance take place over the longer term and because tax expenditures generally occur over many years. We used the GRADE model to provide realistic predictions of the additional numbers of people who would benefit and expressed this as a percentage of those people who do not have access to each SDG indicator in that country and year. For averted deaths, we present the numbers and express them as the percentage of child and maternal deaths in that country. For educational outcomes, we present the additional number of children who attend school at all school levels (data by level are available) and as a percentage of children of primary, lower secondary, and upper secondary school age who are out of school.

To assess the potential of additional revenue equivalent to the foregone revenue from tax expenditures on governance, we show the improvement in the control of corruption and government effectiveness in 2020, with additional revenue equivalent to the tax expenditure in each country.

6 | RESULTS AND LIMITATIONS

We obtain the output for 97 countries for 19 years, 2002–2020. We provide the results for 2020 aggregated by region (Table 1 and Table 2) and by individual country (see Table A1 and Table A2).

Table 1 shows the average foregone revenue as a percentage of tax revenue for the years 2017–2020, by region ranges from 16%–59%, with East Asia and the Pacific spending the least and North America spending the most, (see Figure 1). If governments had additional revenue equivalent to tax expenditures, an additional 70 million people would use basic water, and 146 million would use basic sanitation (see

TABLE 1 The aggregate numbers by region who would access their health determinants if governments had additional revenue equivalent to the foregone revenue because of reported tax expenditures.

Region	Countries with data	% of tax revenue	Additional people who would access Basic water	Countries with data	% of those without basic water	Additional people who would access Safe water	Countries with data	% of those without safe water	Additional people who would access Basic sanitation	Countries with data	% of those without basic sanitation	Additional people who would access Safe sanitation	Countries with data	% of those without safe sanitation
East Asia and Pacific	9	16.02%	8,150,568	9	19.42%	919,145	6	3.00%	14,558,543	9	16.33%	2,954,076	7	16.81%
Europe and Central Asia	36	23.65%	444,774	36	5.93%	28,114,375	35	7.08%	979,664	34	9.11%	30,616,590	36	27.58%
Latin America and Caribbean	14	28.74%	2,968,784	14	46.08%	10,613,177	7	11.13%	7,615,471	14	27.80%	13,615,745	7	4.34%
Middle East and North Africa	5	26.14%	1,341,979	5	31.76%	6,910,560	5	37.59%	3,649,118	5	50.23%	803,433	4	9.35%
North America	2	58.51%	0	2	0.00%	0	1	0.00%	0	2	0.00%	6,564,576	2	56.70%
South Asia	5	19.41%	43,237,069	5	51.70%	1,469,669	2	8.48%	95,482,805	5	34.26%	7,647,500	1	0.96%
Sub-Saharan Africa	26	19.37%	13,427,915	26	5.53%	6,184,130	8	1.36%	23,457,787	26	4.63%	3161	1	0.04%
Aggregate	**97**	**27.41%**	**69,571,089**	**97**	**22.92%**	**54,211,056**	**64**	**9.81%**	**145,743,388**	**95**	**20.34%**	**62,205,081**	**58**	**16.54%**

Note: The values in bold are aggregated global values. For the variables capturing additional people that would access SDGs, the aggregate is the sum total and regional global averages are computed for the variables in percentages, such as those without basic access to the SDGs.

TABLE 2 The numbers of additional children who would attend school each day by region and as a percentage of those out of school in the different school levels, and the numbers of mothers and children who would survive.

Region	Additional children who would attend school each day	% of out of primary school	% of out of lower secondary school	% of out of upper secondary school	Additional children who would survive	Additional children surviving as a % of deaths	Additional mothers who would survive	Additional mothers surviving as a % of deaths	Average improvement in corruption	Average improvement in government effectiveness
East Asia and Pacific	1,141,158	10.85%	9.15%	7.79%	10,354	7.96%	1639	10.94%	0.021000	0.02
Europe and Central Asia	454,213	10.46%	15.58%	19.97%	12,764	16.00%	74	11.38%	0.03	0.03
Latin America and Caribbean	1,200,212	34.46%	24.96%	12.32%	1927	27.05%	55	23.05%	0.04	0.04
Middle East and North Africa	208,204	12.42%	16.83%	6.62%	5939	14.47%	366	28.32%	0.03	0.03
North America	319,342	6.54%	17.97%		73	0.54%	0	0.00%	0.07	0.07
South Asia	8,800,586	15.91%	29.22%	6.02%	53,047	20.67%	1897	29.42%	0.03	0.03
Sub-Saharan Africa	4,842,520	8.05%	7.51%	3.96%	96,627	4.65%	7889	7.50%	0.02	0.03
Aggregate	**16,966,235**	**14.10%**	**17.32%**	**9.45%**	**180,731**	**13.05%**	**11,920**	**15.80%**	**0.03**	**0.04**

Note: The average improvement in the governance indicators by region is shown in columns 9 and 10. The values in bold are aggregated global values . For the variables capturing additional people that would access SDGs, the aggregate is the sum total and global averages are computed for the variables in percentages.
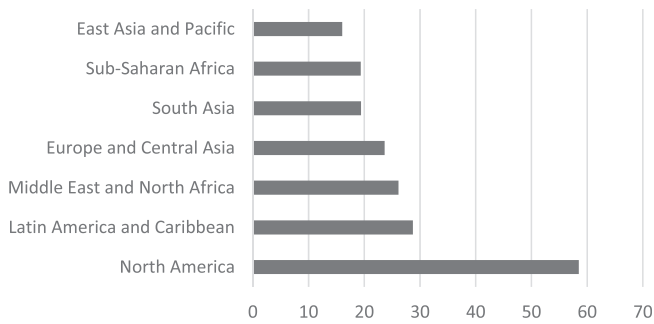
FIGURE 1 Average tax expenditures as % of tax revenue, 2017–2020, by region.
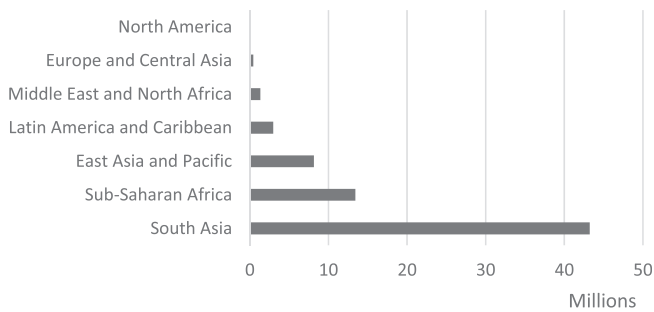

FIGURE 2 The additional number of people in millions who would use basic water if governments had additional revenue equivalent to their tax expenditures.

Figure 2). This means that 23% and 20% of those currently without access would gain access in these 97 countries. The opportunity costs of tax expenditure in terms of the SDGs are greatest in South Asia, where an additional 43 million people would use basic water, and 95 million people would use basic sanitation, which is 52% and 34% of those without access, respectively, in the five countries studied.

Additional revenue and small improvements in governance can significantly impact lower income countries. In contrast, the coverage of many SDG indicators included in GRADE approaches 100% in North American and European countries, so additional revenue has little impact. Nonetheless, not all citizens have access to safely managed sanitation, and additional revenue would have a significant impact, allowing 57% of those without access to access in North American countries, and 28% in Europe and Central Asia.

If governments had additional revenue equivalent to tax expenditure, an additional 17 million children would attend school every day, which is 13.62% (across all school levels) of the children out of school in the 97 countries studied. Additional revenue equivalent to tax expenditures in these countries would ensure 181,000 children survive, which is 13% of children who currently die before the age of 5 years and 12,000 mothers, which is 16% of mothers who currently die around the time of birth in the countries studied.

Additional revenue equivalent to the foregone revenue from tax expenditures improves governance, and we show the improvement in corruption control and government effectiveness in 2020 with additional

revenue. The average for each region is shown in Table 2, and the results by country are shown in Table A2. North America would gain the most, as this is the region that spends the greatest on tax expenditures.

6.1 | Limitations

There is wide variation in the quality of reporting, and while reporting countries have increased from just 12 governments in the 1990s, some remain highly reluctant to report. In addition, most data were collected from the central government, thus excluding subnational data.

Furthermore, only 106 countries report, and the quality of reporting is often poor; thus, improving the format, uniformity, and overall quality of reporting of tax expenditures is critical.

There are several methods for measuring tax expenditures. Most governments report their estimates based on the revenue-foregone approach, and GTED provides these reports. The revenue-foregone-approach computes the revenue that would have been collected if a specific tax expenditure is eliminated. Since this is a static method, it does not account for the interactions and changes in behaviors that eliminate a specific tax break; hence, there is a risk of amplifying the potential of curtailing tax expenditures. Another method uses a revenue-gain approach, which estimates the additional revenue collected after accounting for any change in behavior. Finally, the revenue outlay approach estimates the expenditure required by the government in terms of direct subsidy, which would result in the same benefit for the taxpayer as if the tax expenditures were removed. Although the latter two methods are likely to be more realistic, they are also more challenging and hence not reported by most governments.

In terms of modeling, data on several indicators are incomplete for some regions in the World Development Indicators used by the GRADE. For example, only 8 of the 26 countries in sub-Saharan Africa and 7 of the 14 countries in Latin America and the Caribbean have data on the availability of safe water. Hence, these figures were significantly underestimated. Therefore, we did not present the average percentage of these results aggregated by region. The GTED also expresses expenditures as a share of tax revenues. Ideally, it would be plausible to convert the country-level expenditures to a share of government revenue for estimations in GRADE, which varies by data source.

Additionally, we do not have data on the benefits of tax expenditures, and we cannot compare these findings with the benefits of the SDGs that tax expenditures may bring in specific situations.

7 | DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

The GTED provides valuable insights into tax expenditures and shows that governments spend a significant proportion of their revenues. Countries in Latin America and the Caribbean, East Asia, South Asia, and sub-Saharan Africa do not report clear policy objectives for more than 90% of expenditures, although they may exist. Household expenditure is lowest in East Asia and sub-Saharan Africa, and business

expenditure is lowest in Europe, East Asia, and North America (Redonda et al., 2022).

Here, we analyze all tax expenditures with respect to the opportunity costs for governance and the SDGs. We can also quantify the components of this total, for example, the revenue foregone from tax expenditures for investment. This would allow the benefits of additional revenue to be weighed against any long-term benefits of tax expenditures (which are difficult to isolate). Tax expenditures with the purpose of increasing investment are often redundant and ineffective and have considerable administrative and revenue opportunity costs. Governments should rationalize the use of tax expenditures to identify those that are value for money and those that are not cost-effective and hence could be eliminated. The additional revenue collected and the resulting improvement in public services will enhance the overall investment climate and attract domestic and international investors. This analysis provides policymakers with information on the scale of the potential for SDG progress if tax expenditures are curtailed and could provide a more detailed cost–benefit analysis if combined with the benefits of specific tax expenditures.

Fiscal redistribution appears suboptimal in many countries, and tax expenditures with social policy objectives are frequently regressive. To enhance redistribution, governments should prioritize revenue generation and consider reducing tax expenditure. Here, we demonstrate that foregone revenue from tax expenditures would increase access to public services by millions, which has been shown to be the most effective tool for reducing inequality. In addition, tax expenditures reduce fiscal space in the short term, and to compensate, governments must seek other sources of revenue (Mataba et al., 2023). Lower income countries favor indirect taxes because they are more easily administered. However, they are frequently regressive and increase inequality (unless balanced with cash transfers, which is often not the case in lower income countries) (Lustig et al., 2017).

Governments are pivotal in ensuring SDG progress, and raising and allocating scarce resources are fundamental. Empirical studies have shown that improving fiscal capacity improves governance, and countries that rely on tax revenues are much more likely to be well governed (Moore, 2007, 2015). This study aligns with these findings and demonstrates that if governments have additional revenue equivalent to that foregone because of tax expenditures, government effectiveness and corruption control improve. It is unlikely that tax expenditure would improve governance. The literature indicates that some tax breaks erode good governance.

The massive opportunity costs of tax expenditures reported here require that the reporting, which aligns with the global standards, and justification of all tax expenditures must be an integral part of annual budget reporting to parliament, the public, and multilateral institutions. To make informed decisions, governments must have access to high-quality data and deploy internal data validation processes.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. All authors have contributed to the research and the manuscript and have approved the final version for submission.

DATA AVAILABILITY STATEMENT

The data utilized in this study are publicly accessible. Tax expenditure data can be retrieved from the Global Tax Expenditure Database (GTED), and revenue and development estimations are available from the Government Revenue and Development Estimations (GRADE) website of the University of St. Andrews. Specific queries can be directed to the corresponding author.

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APPENDIX A

TABLE A1 The numbers of additional people by country who would use basic and safe water, basic and safe sanitation, attend school and survive, if their government had additional revenue equivalent to the foregone revenue because of reported tax expenditures.

Country	% of tax revenue	Additional people who use clean water	% of those without basic water	Additional people who use safe water	% of those without safe water	Additional people who use basic sanitation	% of those without basic sanitation	Additional people who use safe sanitation	% of those without safe sanitation	Additional children in school	% of children of primary school age not in school	% of children of lower secondary school age not in school	% of children of upper secondary school age not in school	Additional children who survive	% of those who die	Additional mothers who survive	% of those who die
Australia	36.18%	0	0.00%			0	0.00%	175,472	2.66%	7326	0.00%	22.39%	24.75%	3	0.31%	0	
Indonesia	17.75%	5,747,337	27.89%			9,870,888	26.82%	1,939,372	8.27%	768,250	16.76%	16.52%	6.90%	5483	5.29%	881	11.45%
Japan	15.68%	0	0.00%	0	0.00%	0	0.00%	0		0	0.00%	0.00%	0.00%	180	9.05%	0	0.00%
Korea—Rep.	16.2%	0	0.00%	0	0.00%	0	0.00%	31,102	100.00%	13,835	7.28%	5.57%	9.65%	82	9.28%	0	0.00%
Mongolia	14.3%	61,571	12.89%	150,597	6.54%	169,310	15.93%	21,736	1.48%	4580	13.55%	7.03%	7.90%	198	17.45%	10	34.93%
New Zealand	4.14%	0	0.00%	0	0.00%	0	0.00%	22,791	2.51%	230	0.00%	0.00%	6.35%	2	0.54%	0	0.00%
Papua New Guinea	4.8%	50,429	0.95%			56,248	0.71%			9191	2.12%	1.73%	0.92%	206	1.84%	21	4.42%
Philippines	18.32%	2,289,916	34.65%	760,979	1.29%	4,456,028	22.39%	762,895	1.73%	337,550	27.99%	18.28%	9.16%	4195	6.40%	727	36.74%
Tonga	16.79%	1315	98.40%	7569	10.20%	6069	81.10%	709	1.03%	197	29.99%	10.84%	4.50%	6	21.50%	0	0.00%
East Asia and Pacific—total and averages	**16.02%**	**8,150,568**	**19.42%**	**919,145**	**3.00%**	**14,558,543**	**16.33%**	**2,954,076**	**16.81%**	**1,141,158**	**10.85%**	**9.15%**	**7.79%**	**10,354**	**7.96%**	**1639**	**10.94%**
Albania	23.76%	54,454	38.92%	158,547	19.05%	19,865	100.00%	50,709	3.42%	5030	16.09%	100.00%	14.48%	105	37.67%	3	100.00%
Armenia	31.79%	842	100.00%	283,871	77.30%	168,754	99.26%	41,701	4.85%	9165	14.95%	17.83%	25.34%	186	47.02%	9	86.88%
Austria	10.54%	0	0.00%	0	0.00%			32,101	100.00%	1437	5.15%	6.79%	4.18%	1	0.20%	0	0.00%
Belgium	25.21%	0	0.00%	0	0.00%			322,333	24.99%	5552	20.36%	18.25%	67.13%	1	0.13%	0	0.00%
Bulgaria	2.92%	607	0.88%	26,766	16.22%	823	0.09%	30,800	1.60%	1079	0.56%	1.02%	1.22%	29	7.44%	0	0.00%
Czechia	54.58%	0	0.00%	0	0.00%	0	0.00%	297,188	18.77%	11,679	15.36%	28.37%	38.76%	124	39.90%	0	0.00%
Denmark	6.84%	0	0.00%	0	0.00%	0	0.00%	30,005	6.34%	408	0.00%	5.17%	2.13%	0	0.00%	0	0.00%
Estonia	3.79%	0	0.00%	0	0.00%	0	0.00%	7350	7.97%	174	3.66%	4.77%	2.66%	2	8.12%	0	0.00%
Finland	59.12%	0	0.00%	0	0.00%	0	0.00%	104,818	11.92%	3897	19.58%	35.69%	33.88%	0	0.46%	0	0.00%
France	23.69%	0	0.00%	0	0.00%	0	0.00%	1,215,997	8.41%	23,171	0.00%	16.88%	17.45%	9	0.29%	0	0.00%

TABLE A1 (Continued)

Country	% of tax revenue %	Additional people who use clean water	% of those without basic water	Additional people who use safe water	% of those without safe water	Additional people who use basic sanitation	% of those without basic sanitation	Additional people who use safe sanitation	% of those without safe sanitation	Additional children in school	% of children of primary school age not in school	% of children of lower secondary school age not in school	% of children of upper secondary school age not in school	Additional children who survive	% of those who die	Additional mothers who survive	% of those who die
Georgia	24.33%	17,707	17.95%	185,661	14.82%	16,922	3.19%	80,240	3.29%	1291	0.00%	0.00%		130	27.79%	6	38.56%
Germany	7.79%	0	0.00%	0	0.00%	0	0.00%	876,769	36.74%	12,278	9.74%	8.04%	2.28%	5	0.18%	0	0.00%
Greece	16.87%	0	0.00%	0	0.00%	0	0.00%	375,760	42.42%	4457	5.71%	8.68%	13.48%	24	7.68%	0	0.00%
Hungary	9.64%	0	0.00%	108	0.01%	0	0.00%	140,753	11.81%	3162	1.79%	3.30%	4.83%	63	17.01%	0	0.11%
Iceland	12.11%	0	0.00%	0	0.00%	0	0.00%	3464	5.80%	83	5.47%	7.01%	1.93%	0	0.00%	0	0.00%
Ireland	9.58%	0	0.00%	0	0.00%	0	0.00%	50,995	5.98%	0	0.00%	0.00%	0.00%	1	0.62%	0	0.00%
Italy	13.9%	0	0.00%	0	0.00%	0	0.00%	2,163,887	86.27%	23,096	13.02%	15.73%	9.74%	13	1.09%	0	0.00%
Latvia	49.98%	0	0.00%	0	0.00%	0	0.00%	89,683	28.45%	2196	48.17%	39.84%	43.35%	34	50.89%	0	0.01%
Lithuania	17.45%	0	0.00%	1	0.00%	0	0.00%	60,259	35.58%	471	0.00%	0.00%	90.95%	30	31.59%	0	0.02%
Luxembourg	5.75%	0	0.00%	0	0.00%	0	0.00%	368	1.81%	37	2.07%	0.67%	0.66%	0	0.00%	0	0.00%
Moldova	18.43%	62,683	25.23%	149,278	21.85%	135,351	24.15%	0	0.00%	4079	69.26%	28.69%	9.83%	133	23.76%	4	100.00%
Netherlands	61.42%	0	0.00%	0	0.00%	0	0.00%	436,038	100.00%	6149	0.00%	0.00%	100.00%	4	0.56%	0	0.00%
North Macedonia	11.72%	9458	20.19%	86,320	17.98%	7133	20.61%	25,554	1.40%	1949	5.71%	5.95%	5.27%	36	29.92%	0	0.00%
Norway	13.26%	0	0.00%	0	0.00%	0	0.00%	19,417	1.04%	516	0.00%	4.75%	4.42%	0	0.00%	0	0.00%
Poland	11.7%	0	0.00%	0	0.00%	156	0.26%	856,378	23.89%	16,108	5.64%	5.14%	13.75%	270	16.47%	0	0.00%
Portugal	24.22%	0	0.00%	0	0.00%	0	0.00%	316,468	20.60%	0	0.00%	0.00%	0.00%	50	18.23%	0	0.00%
Romania	23.42%	0	0.00%	15,063	0.43%	10,532	0.42%	567,455	17.47%	22,653	6.20%	5.72%	6.47%	603	45.18%	8	38.97%
Russian Federation	98.73%	57,712	1.33%	27,143,459	78.83%	4899	0.03%	15,806,293	28.00%	0	0.00%	0.00%	0.00%	6325	81.48%	19	13.11%
Slovak Republic	8.57%	0	0.00%	1	0.00%	0	0.00%	80,279	8.14%	1626	1.59%	3.86%	4.67%	22	6.92%	0	0.00%
Slovenia	28.62%	0	0.00%	0	0.00%	0	0.00%	73,266	12.25%	1251	16.22%	30.78%	39.39%	9	21.61%	0	0.00%
Spain	20.68%	0	0.00%	0	0.00%	0	0.00%	1,667,530	81.31%	20,687	8.55%	8.44%	15.12%	90	8.27%	0	0.00%
Sweden	20.21%	0	0.00%	0	0.00%	0	0.00%	178,134	33.94%	1417	0.00%	0.00%	44.72%	0	0.09%	0	0.00%
Switzerland	35.31%	0	0.00%	0	0.00%	0	0.00%	30,234	100.00%	2754	0.00%	17.15%	3.97%	0	0.04%	0	0.00%
Turkiye	28.16%	3486	0.14%	0	0.00%	552	0.08%	3,237,662	17.84%	201,381	58.56%	100.00%	30.23%	4159	34.59%	5	2.05%
Ukraine	4.53%	237,827	8.88%	65,300	1.35%	614,676	61.63%	72,159	0.58%	14,380	6.94%	16.43%	23.24%	276	9.69%	20	30.07%
United Kingdom	32.78%	0	0.00%	0	0.00%	0	0.00%	1,274,543	100.00%	50,598	16.32%	15.87%	23.27%	31	1.06%	0	0.00%
Europe and Central Asia	**23.65%**	**444,774**	**5.93%**	**28,114,375**	**7.08%**	**979,664**	**9.11%**	**30,616,590**	**27.58%**	**454,213**	**10.46%**	**15.58%**	**19.97%**	**12,764**	**16.00%**	**74**	**11.38%**
Bolivia	1.85%	37,637	4.77%			51,737	1.27%			3298	1.67%	1.27%	0.67%	110	1.64%	15	3.48%

(Continues)

TABLE A1 (Continued)

Country	% of tax revenue	Additional people who use clean water	% of those without basic water	Additional people who use safe water	% of those without safe water	Additional people who use basic sanitation	% of those without basic sanitation	Additional people who use safe sanitation	% of those without safe sanitation	Additional children in school	% of children of primary school age not in school	% of children of lower secondary school age not in school	% of children of upper secondary school age not in school	Additional children who survive	% of those who die	Additional mothers who survive	% of those who die
Brazil	30.59%	253	0.01%	1,109,841	3.51%	1196	0.01%	8,602,716	7.79%	348,069	16.91%	20.54%	10.97%	5197	12.08%	1	0.05%
Chile	14.71%	0	0.00%	6125	2.58%	0	0.00%	249,922	6.05%	27,087	72.79%	84.25%	40.11%	436	27.74%	2	7.96%
Colombia	52.93%	523,219	40.93%	7,365,758	53.58%	1,167,033	36.26%	1481,187	3.56%	205,213	36.65%	43.06%	28.15%	5214	53.45%	132	25.69%
Costa Rica	37.18%	67	0.66%	6733	0.68%	18,279	15.98%	152,955	4.32%	10,047	96.50%	39.34%	26.34%	268	50.00%	0	0.00%
Dominican Republic	38.83%	376,912	100.00%			806,462	53.38%			41,556	14.57%	27.79%	12.76%	1316	17.58%	61	28.83%
Ecuador	36.09%	541,187	48.15%	593,794	10.59%	1,924,371	87.69%			54,769	81.27%	59.24%	10.40%	2200	47.09%	106	49.71%
El Salvador	19.71%	129,001	100.00%			389,044	35.23%			16,668	4.88%	6.30%	4.65%	283	21.64%	27	66.52%
Guatemala	22.34%	488,765	48.40%			1,097,438	20.30%			67,069	9.68%	4.61%	3.48%	1162	12.88%	111	29.20%
Honduras	39.78%	436,248	100.00%			1,187,859	72.35%	82,150	1.61%	46,240	8.84%	5.94%	5.78%	1293	34.97%	109	72.08%
Mexico	28.08%	403,195	100.00%	1,412,761	1.97%	706,135	7.96%	3,008,822	5.60%	353,027	75.11%	27.74%	9.43%	8750	32.57%	180	15.30%
Panama	43.65%	5164	2.14%			7143	1.08%			12,418	4.67%	6.14%	7.94%	408	36.89%	2	5.74%
Paraguay	10.59%	27,137	100.00%	118,165	4.97%	253,262	52.56%	37,992	1.44%	10,051	2.06%	2.99%	3.32%	260	10.03%	18	18.14%
Uruguay	25.97%	0	0.00%			5512	5.21%			4701	56.80%	20.28%	8.51%	79	20.15%	0	0.00%
Latin America and Caribbean	**28.74%**	**2,968,784**	**46.08%**	**10,613,177**	**11.13%**	**7,615,471**	**0**	**13,615,745**	**4.34%**	**1,200,212**	**34.46%**	**24.96%**	**12.32%**	**1927**	**27.05%**	**55**	**23.05%**
Algeria	13.09%	681,489	28.21%	2,521,546	21.01%	2,152,285	35.30%			59,217	43.59%	20.48%	5.90%	3058	13.70%	189	24.23%
Israel	16.44%	0	0.00%	0	0.00%	0	0.00%	56,408	12.15%	0	0.00%	0.00%	0.00%	9	1.48%	0	0.00%
Jordan	65.91%	115,844	100.00%	1,562,807	100.00%	319,119	100.00%	415,316	21.43%	78,589	8.80%	11.97%	14.41%	1751	48.02%	97	100.00%
Morocco	11.93%	484,359	13.75%	1,731,034	23.53%	741,529	15.85%	267,090	1.20%	51,491	9.73%	9.66%	4.73%	1121	9.13%	80	17.38%
Tunisia	23.32%	60,287	16.84%	1,095,173	43.41%	436,185	100.00%	64,618	2.63%	18,907	0.00%	42.05%	8.04%	0	0.00%	0	0.00%
Middle East and North Africa	**26.14%**	**1,341,979**	**31.76%**	**6,910,560**	**37.59%**	**3,649,118**	**50.23%**	**803,433**	**9.35%**	**208,204**	**12.42%**	**16.83%**	**6.62%**	**5939**	**14.47%**	**366**	**28.32%**
Canada	47.45%	0	0.00%	0	0.00%	0	0.00%	796,276	13.40%	12,319	0.00%	0.00%	28.64%	15	0.82%	0	0.00%
United States	69.57%	0	0.00%	0	0.00%	0	0.00%	5,768,300	100.00%	307,023	13.08%	35.93%	39.64%	58	0.25%	0	0.00%
North America	**58.51%**	**0**	**0.00%**	**0**	**0.00%**	**0**	**0.00%**	**6,564,576**	**56.70%**	**319,342**	**6.54%**	**17.97%**		**73**	**0.54%**	**0**	**0.00%**
Bhutan	16%	20,780	100.00%	77,893	15.92%	3265	1.80%			2473	27.88%	17.74%	6.78%	19	7.10%	3	53.54%
India	27.43%	40,589,296	28.40%			88,813,437	18.76%	7,647,500	0.96%	7,991,397	30.53%	29.48%	6.85%	41,837	4.76%	7921	27.31%
Maldives	26.83%	2366	100.00%			4321	100.00%			616	15.21%	8.44%	5.34%	36	75.96%	1	20.45%
Pakistan	16.98%	2,286,890	10.28%	1,391,776	1.03%	6,053,579	7.03%			780,117	5.94%	3.07%	2.58%	10,866	2.26%	1532	12.80%

TABLE A1 (Continued)

Country	% of tax revenue	Additional people who use clean water	% of those without basic water	Additional people who use safe water	% of those without safe water	Additional people who use basic sanitation	% of those without basic sanitation	Additional people who use safe sanitation	% of those without safe sanitation	Additional children in school	% of children of primary school age not in school	% of children of lower secondary school age not in school	% of children of upper secondary school age not in school	Additional children who survive	% of those who die	Additional mothers who survive	% of those who die
Sri Lanka	9.83%	337,737	19.83%			608,203	43.70%			25,983	0.00%	87.38%	8.55%	288	13.27%	31	32.98%
South Asia	19.41%	43,237,069	51.70%	1,469,669	8.48%	95,482,805	34.26%	7,647,500	0.96%	8,800,586	15.91%	29.22%	6.02%	53,047	20.67%	1897	29.42%
Benin	19.11%	163,833	3.75%			156,439	1.49%			73,527	14.71%	5.23%	2.86%	657	1.63%	211	8.63%
Burkina Faso	6.35%	72,539	0.64%			88,534	0.53%			47,357	2.91%	1.54%	0.95%	518	0.78%	68	3.34%
Cabo Verde	30.23%	17,127	25.18%			41,317	31.78%			2549	28.62%	19.38%	9.64%	44	29.11%	3	73.46%
Cameroon	16.22%	306,800	3.38%			709,136	4.83%			92,955	6.51%	3.61%	2.65%	1734	2.55%	184	4.44%
Congo—Dem. Rep.	9.45%	409,743	0.82%			173,716	0.22%			139,683	2.50%	2.67%	2.46%	6630	2.06%	285	1.32%
Cote d'Ivoire	8.78%	264,138	3.39%	278,945	1.61%	562,198	3.20%			56,015	4.26%	2.11%	1.59%	956	1.35%	119	2.70%
Eswatini	1.92%	3982	1.15%			7838	1.86%			388	0.96%	1.90%	1.88%	14	0.83%	1	1.62%
Ethiopia	56.39%	2,697,183	4.56%	2,974,341	2.96%	4,514,513	4.33%			1,180,660	17.62%	10.89%	5.75%	14,419	7.49%	1481	13.51%
Gabon	6.66%	29,942	8.91%			61,224	5.32%			0	0.00%	0.00%		114	4.40%	10	6.59%
Guinea	17.68%	114,898	2.41%			154,670	1.67%			52,237	4.41%	2.73%	2.22%	792	1.69%	85	3.34%
Kenya	22.84%	1,168,651	5.86%			2,760,579	7.89%			260,807	13.21%	31.85%	11.64%	3117	5.55%	348	4.51%
Lesotho	3.27%	9824	1.57%	17,380	1.08%	7324	0.64%			1372	5.81%	2.65%	0.98%	39	0.85%	4	0.97%
Liberia	30.97%	55,325	4.40%			6979	0.17%			32,423	7.99%	7.13%	6.49%	807	6.39%	42	4.01%
Madagascar	18.31%	137,896	1.05%			144,022	0.58%			112,417	13.79%	5.08%	2.32%	1466	2.51%	84	2.45%
Mali	18.99%	237,929	6.42%			409,414	3.53%			90,272	3.58%	2.60%	2.56%	2540	2.85%	220	5.61%
Mauritania	32.03%	154,440	12.12%			276,704	12.26%			26,688	7.15%	5.91%	4.06%	656	10.44%	61	8.81%
Mauritius	10.63%	115	6.96%			205	0.36%			853	0.00%	21.98%	4.84%	19	8.62%	0	1.81%
Niger	27.35%	194,326	1.50%			356,679	1.72%			183,726	5.40%	3.59%	2.53%	2110	1.63%	192	3.93%
Nigeria	47.81%	5,873,184	12.59%	2,470,177	1.51%	9,678,068	8.11%			1,871,869	9.80%	10.07%	9.36%	50,678	5.70%	3754	4.58%
Rwanda	12.4%	146,721	2.82%	276,716	2.39%	222,126	5.42%			37,488	13.48%	17.41%	3.08%	181	1.12%	36	3.52%
Senegal	34.89%	615,787	24.83%			745,641	10.50%			159,359	7.97%	8.09%	5.93%	1408	6.47%	278	19.70%
Sierra Leone	23.18%	72,820	2.44%	37,254	0.51%	8770	0.13%			48,802	11.45%	8.79%	3.84%	720	2.53%	58	5.05%

(Continues)

TABLE A1 (Continued)

South Africa	19.87%	100,181	2.79%	1,290,406	10.19%					120,169	8.28%	12.21%	7.38%	3791	9.42%	52	3.32%
Tanzania	8.09%	308,206	1.27%	371,539	0.88%					118,082	3.10%	1.41%	0.85%	1782	1.61%	180	3.32%
Togo	10.22%	44,715	1.72%	37,622	0.57%		1.04%	3161	0.04%	19,237	10.96%	3.93%	1.72%	302	1.68%	23	2.04%
Uganda	9.91%	227,610	1.16%	91,695	0.25%		1.80%			113,586	4.91%	2.52%	1.31%	1130	1.56%	110	2.38%
Sub-Saharan Africa	**19.37%**	**13,427,915**	**5.53%**	**6,184,130**	**1.36%**	**23,457,787**	**4.63%**	**3161**	**0.04%**	**4,842,520**	**8.05%**	**7.51%**	**3.96%**	**96,627**	**4.65%**	**7889**	**7.50%**

Note: These numbers are also expressed as a percentage of those who do not have access to these rights and as a percentage of those who die in each country. The values in bold are aggregated values per region. For the variables capturing additional people that would access SDGs, the aggregate is the sum total and regional averages are computed for the variables that are expressed in percentages at country-level.

TABLE A2 The improvement in corruption and government effectiveness due to the additional government revenue.

Country	% of tax revenue	Improvement in corruption	Improvement in government effectiveness	Country	% of tax revenue	Improvement in corruption	Improvement in government effectiveness
Australia	36.18	0.04	0.05	Dominican Republic	38.83	0.05	0.05
Indonesia	17.75	0.02	0.03	Ecuador	36.09	0.04	0.05
Japan	15.68	0.02	0.02	El Salvador	19.71	0.03	0.03
Korea—Rep.	16.20	0.02	0.02	Guatemala	22.34	0.03	0.03
Mongolia	14.30	0.02	0.02	Honduras	39.78	0.05	0.05
New Zealand	4.14	0.01	0.01	Mexico	28.08	0.04	0.04
Papua New Guinea	4.80	0.01	0.01	Panama	43.65	0.05	0.06
Philippines	18.32	0.02	0.03	Paraguay	10.59	0.01	0.02
Tonga	16.79	0.02	0.02	Uruguay	25.97	0.03	0.04
East Asia and Pacific— regional averages	16.02	0.02	0.02	Latin America and the Caribbean—regional averages	28.74	0.04	0.04
Albania	23.76	0.03	0.03	Algeria	13.09	0.02	0.02
Armenia	31.79	0.04	0.04	Israel	16.44	0.02	0.02
Austria	10.54	0.01	0.02	Jordan	65.91	0.07	0.08
Belgium	25.21	0.03	0.03	Morocco	11.93	0.02	0.02
Bulgaria	2.92	0.00	0.00	Tunisia	23.32	0.03	0.03
Czechia	54.58	0.06	0.07	Middle East and North Africa—regional averages	26.14	0.03	0.03
Denmark	6.84	0.01	0.01	Canada	47.45	0.06	0.06
Estonia	3.79	0.01	0.01	United States	69.57	0.08	0.08
Finland	59.12	0.07	0.07	North America	58.51	0.07	0.07
France	23.69	0.03	0.03	Bhutan	16.00	0.02	0.02
Georgia	24.33	0.03	0.03	India	27.43	0.03	0.04
Germany	7.79	0.01	0.01	Maldives	26.83	0.03	0.04
Greece	16.87	0.02	0.02	Pakistan	16.98	0.02	0.02
Hungary	9.64	0.01	0.01	Sri Lanka	9.83	0.01	0.01
Iceland	12.11	0.02	0.02	South Asia	19.41	0.03	0.03
Ireland	9.58	0.01	0.01	Benin	19.11	0.03	0.03
Italy	13.90	0.02	0.02	Burkina Faso	6.35	0.01	0.01
Latvia	49.98	0.06	0.06	Cabo Verde	30.23	0.04	0.04
Lithuania	17.45	0.02	0.02	Cameroon	16.22	0.02	0.02
Luxembourg	5.75	0.01	0.01	Congo—Dem. Rep.	9.45	0.01	0.01
Moldova	18.43	0.02	0.03	Cote d'Ivoire	8.78	0.01	0.01
Netherlands	61.42	0.07	0.07	Eswatini	1.92	0.00	0.00
North Macedonia	11.72	0.02	0.02	Ethiopia	56.39	0.06	0.07
Norway	13.26	0.02	0.02	Gabon	6.66	0.01	0.01
Poland	11.70	0.02	0.02	Guinea	17.68	0.02	0.03
Portugal	24.22	0.03	0.03	Kenya	22.84	0.03	0.03
Romania	23.42	0.03	0.03	Lesotho	3.27	0.00	0.00
Russian Federation	98.73	0.10	0.11	Liberia	30.97	0.04	0.04
Slovak Republic	8.57	0.01	0.01	Madagascar	18.31	0.02	0.03
Slovenia	28.62	0.04	0.04	Mali	18.99	0.03	0.03

(Continues)

TABLE A2 (Continued)

Country	% of tax revenue	Improvement in corruption	Improvement in government effectiveness	Country	% of tax revenue	Improvement in corruption	Improvement in government effectiveness
Spain	20.68	0.03	0.03	Mauritania	32.03	0.04	0.04
Sweden	20.21	0.03	0.03	Mauritius	10.63	0.01	0.02
Switzerland	35.31	0.04	0.05	Niger	27.35	0.03	0.04
Turkiye	28.16	0.03	0.04	Nigeria	47.81	0.06	0.06
Ukraine	4.53	0.01	0.01	Rwanda	12.40	0.02	0.02
United Kingdom	32.78	0.04	0.04	Senegal	34.89	0.04	0.05
Europe and Central Asia—regional averages	23.65	0.03	0.03	Sierra Leone	23.18	0.03	0.03
Bolivia	1.85	0.00	0.00	South Africa	19.87	0.03	0.03
Brazil	30.59	0.04	0.04	Tanzania	8.09	0.01	0.01
Chile	14.71	0.02	0.02	Togo	10.22	0.01	0.01
Colombia	52.93	0.06	0.07	Uganda	9.91	0.01	0.01
Costa Rica	37.18	0.05	0.05	Sub-Saharan Africa—regional averages	19.37	0.02	0.03

Notes: The values highlighted in grey are regional averages for the percentage of tax revenue and additional improvement in corruption and government effectiveness.

TABLE A3 Definitions of key indicators.

Indicator	Definition	Original source
People using 'at least' basic drinking water services (% of population)	The percentage of people using at least basic water services. This indicator encompasses both people using basic water services as well as those using safely managed water services. Basic drinking water services are defined as drinking water from an improved source, provided collection time is not more than 30 min for a round trip. Improved water sources include piped water, boreholes or tube wells, protected dug wells, protected springs, and packaged or delivered water.	WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation And Hygiene (washdata.org).
People using safely managed drinking water services (% of population)	The percentage of people using drinking water from an improved source that is accessible on premises is available when needed and free from fecal and priority chemical contamination. Improved water sources include piped water, boreholes or tube wells, protected dug wells, protected springs, and packaged or delivered water.	WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation And Hygiene (washdata.org).
People using at least basic sanitation services (% of population)	The percentage of people using at least basic sanitation services, that is, improved sanitation facilities that are not shared with other households. This indicator encompasses both people using basic sanitation services as well as those using safely managed sanitation services. Improved sanitation facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, compositing toilets or pit latrines with slabs.	WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation And Hygiene (washdata.org).
People using safely managed sanitation services (% of population)	The percentage of people using improved sanitation facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite. Improved sanitation facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, compositing toilets or pit latrines with slabs.	WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation And Hygiene (washdata.org).
Maternal mortality ratio (national estimate, per 100,000 live births)	Maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births.	The country data compiled, adjusted, and used in the estimation model by the Maternal Mortality Estimation Inter-Agency Group (MMEIG).
Mortality rate, under-five (per 1000 live births)	Under-five mortality rate is the probability per 1000 that a newborn baby will die before reaching age five, if subject to age-specific mortality rates of the specified year.	Estimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org.
Control of Corruption: Estimate	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, that is, ranging 2.5 to 2.5.	Kaufman & Kraay, (2023).
Government Effectiveness: Estimate	Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, that is, ranging from approximately −2.5 to 2.5.	Kaufman & Kraay, (2023).

Note: The table presents definitions of select indicators as drawn from the World Development Indicators (WDI) of the World Bank (2021) as cited in the main text and references. Since these are standard definitions, the authors did not rephrase the wording.