



GROUP OF TWENTY

G-20 NOTE ON ALTERNATIVE OPTIONS FOR REVENUE MOBILIZATION

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EXECUTIVE SUMMARY

This note discusses alternative options for mobilizing revenue to support achievement of the Sustainable Development Goals (SDGs), notably those that address hunger and poverty. It was prepared by IMF staff¹ in response to a request from the Brazilian G20 presidency for an assessment of revenue-raising options that are currently being discussed internationally, including internationally coordinated taxes and domestic revenue mobilization.

Achieving the SDGs will require significant resources. Estimates suggest that eradicating hunger and extreme poverty would require global annual financing of 0.03 and 0.08 percent of global GDP, respectively. Achieving key health, education, infrastructure, and climate risk targets would cost 3.8 percent of GDP. Financing needs are concentrated among low-income developing economies.

Further international tax cooperation can play an important role in raising revenue but will be insufficient to fund the SDGs. Ongoing international tax reforms, such as the global minimum corporate tax and information sharing, make a positive yet modest revenue contribution but are important as they allow for more effective taxation of large multinationals and wealthy individuals. Significant revenue potential lies also in carbon taxation, which is a potent way to meet global climate objectives. It includes levies geared toward international transportation—a sector currently exempt from such taxes. Financial transactions taxes would be associated with large economic distortions, even if globally coordinated. A globally coordinated wealth tax would help address inequality but seems a remote option and should not prevent countries from pursuing their own reforms to more effectively tax capital income. For all internationally coordinated tax reform options, only a small portion of the revenue will accrue to developing countries where most of the financing needs for the SDGs are. To address this mismatch, revenue sharing arrangements could be considered, for instance, under a global carbon tax.

There is significant scope for revenue mobilization through domestic tax reforms. Developing countries have an average tax gap of 9 percent of GDP, that is they raise less than what is possible, based on best-performing peers under similar circumstances. While reform options are country specific, common options are to broaden tax bases (by reforming tax expenditures) and improve tax compliance through dedicated administrative reform efforts and a well-designed digital transformation of tax and customs administrations. These domestic reforms are usually not easy to pursue and should be managed carefully by a strong political leadership. The medium-term revenue strategy provides a framework to formulate and implement such reforms. Experiences from several countries provide examples of how increased revenue mobilization has been achieved. Capacity development, including from the IMF, can support such reforms.

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INTRODUCTION

1. **Developing countries face significant financing needs to meet the sustainable development goals.** The G20 has launched a new Global Alliance against hunger and poverty (Global Alliance, henceforth) and has drawn attention to the financing needs for climate action and other SDGs.² While various sources of finance can be considered (including through multilateral development banks, private finance, domestic borrowing, and expenditure reform), revenue mobilization through the tax system will likely play a key role in achieving these goals.
2. **This note discusses alternative options for revenue mobilization, both from strengthened international tax cooperation and domestic revenue mobilization.** Regarding international tax cooperation, the note will consider income tax reforms that build on recent and ongoing initiatives of the G20, as well as innovative policy ideas that have been under discussion, such as globally coordinated taxes on international transportation, carbon, or financial transactions. The paper provides an analytical assessment of these reforms, exploring the impact on revenue collection, their economic and social effects, and considerations about implementation. Regarding domestic revenue mobilization, the note explores options to enhance tax capacity, paying special attention to the quality of reform options, including progressive alternatives such as the taxation of wealthy individuals. A broader assessment of domestic resource mobilization, including through domestic bond markets, is under way by the IMF and the World Bank Group.
3. **The note is structured along three key areas.** Section II elaborates on the magnitude of the revenue needs for achieving the SDGs. Section III discusses several options for strengthened international tax cooperation. Section IV considers domestic revenue mobilization initiatives. Finally, Section V concludes.

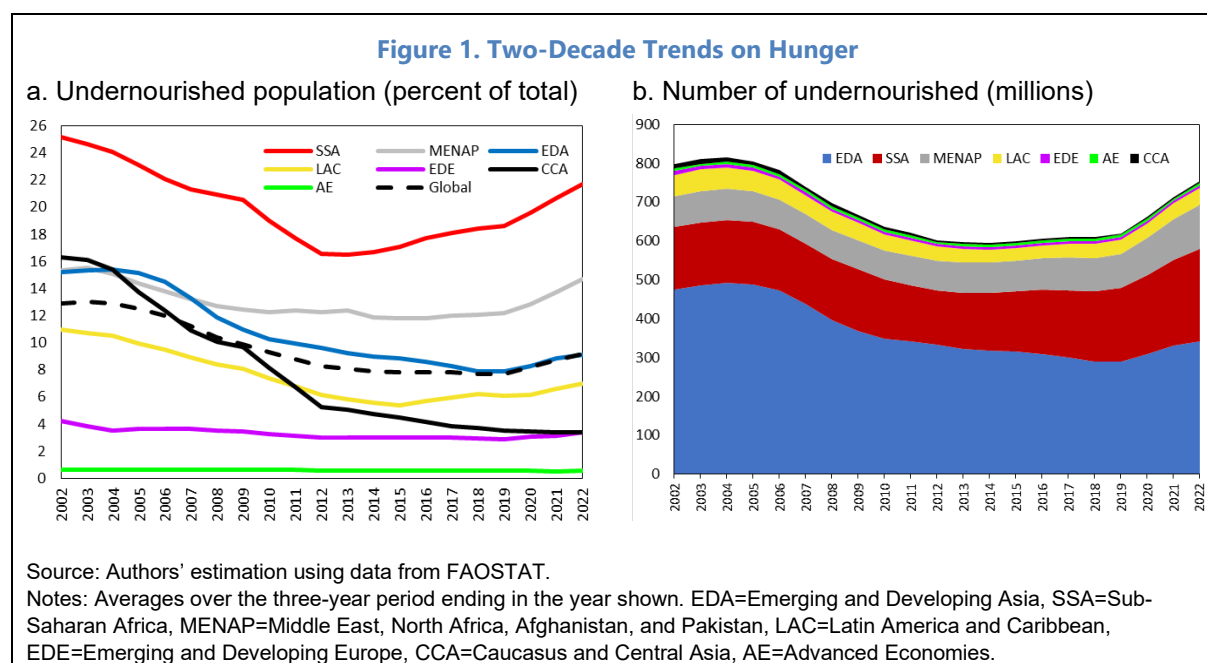
ASSESSING REVENUE NEEDS

4. **This section reviews the financing needs for achieving the SDGs.** It will start with a discussion about SDG2 “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” and SDG1 “End poverty in all its forms everywhere.” This is followed by considering the costs of meeting other core and climate-related needs in SDGs for human and physical capital development.

² See the report of the Independent Expert Group on the Triple Agenda.

A. Hunger and Extreme Poverty

5. The resurgent trend of global hunger calls for heightened financial commitment to meet SDG2. The Global Alliance emerges in a time of rising global hunger after a period of decline and stagnation. The number of undernourished people began to increase from its 2014 low of 558 million (7.9 percent of the global population) to 735 million (9.2 percent of the population) in 2022 (Figure 1). The worsening conditions since the mid-2010s were fueled by a combination of factors, including greater frequency of conflicts, extreme weather events, and economic downturns in some countries (FAO and others 2019). Furthermore, (moderate and severe) food insecurity—a broader concept that encompasses various levels of access to and availability of food—also increased, affecting about 30 percent of the global population (2.4 billion people) in 2022, reflecting the persistent challenge of the pandemic (FAO and others 2023). Projections point to a decline in hunger to 590 million people by 2030, which is higher than 568 million projected prior to Russia’s war in Ukraine, and significantly higher than the pre-pandemic projection (472 million).



6. The burden of hunger and progress in reducing it are highly unevenly distributed across the world. While the absolute population experiencing hunger in Asia far outstrips the number in any other region, sub-Saharan Africa faces the highest rate of undernourishment, and worryingly also the sharpest escalation in prevalence. The Middle East, North Africa, Afghanistan and Pakistan and Latin America and the Caribbean regions have also experienced rising rates of undernourishment since the middle of the past decade. In contrast, Emerging and Developing Europe has benefitted from a steady and rapid decline in the share of the population suffering hunger, even during the pandemic and following Russia’s war in Ukraine.

7. Additional annual spending to achieve significant progress in SDG2 is estimated at 0.03 percent of global GDP. In 2015, in the framework of the SDG agenda, the G7 pledged (“Elmau

commitment”) to lift 500 million people from hunger and malnutrition by 2030. This commitment and the adoption of SDG2 in the same year gave rise to modelling exercises to assess the cost. The additional annual cost of reducing the number of people suffering from hunger by 490 million by 2030 amounts to \$14 billion or 0.01 percent of 2030 world GDP (ZEF and FAO 2020). In addition to its key targets of ending hunger and malnutrition, SDG2 also identifies the need to strengthen the productivity and incomes of smallholder producers and to increase the sustainability of the agricultural sector by limiting its contribution to climate change (e.g., through methane emissions). With these additional elements Laborde and others (2020) estimate that an additional annual spending of \$33 billion (0.02 percent of global 2030 GDP) is required to prevent 490 million people from experiencing hunger (Target 2.1), to double 545 million smallholder farmers’ incomes (Target 2.3) and to align greenhouse gas emissions from the agriculture sector to the Paris agreement (Target 2.4).

8. Careful consideration of the spending composition is as important as its overall level.

Some of the SDG2 costing approaches go beyond estimating an aggregate additional cost and also offer a roadmap of several least-cost (in terms of spending per person required to prevent people from experiencing hunger) expenditure areas.³ These include agricultural research and development to develop improved crop varieties, training producers in optimal farming practices, information and communication technology in the sector, and small-scale irrigation, among others (ZEF and FAO 2020). Beyond agriculture, social assistance programs can strengthen the food purchasing power of those at risk of hunger, appropriate storage facilities can reduce post-harvest losses, and rural transport and other infrastructure is critical for the good functioning of food markets and thus for lowering and stabilizing food prices (Laborde, Parent, and Smaller 2020).

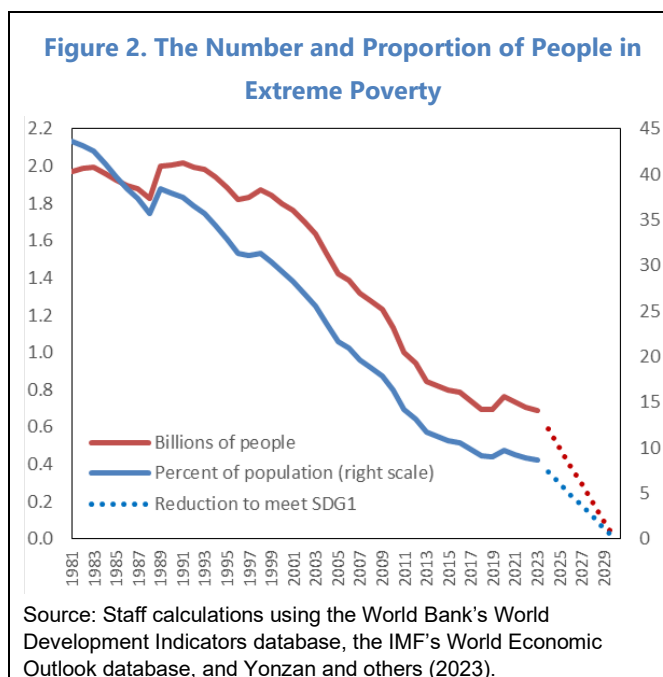
9. Eradicating hunger requires more than just additional and better spending. Large-scale conflict can lead to hunger and food insecurity, affecting even distant individuals. Food often cannot be transported to conflict-affected areas. The destruction of agricultural production and disruptions in international trade, which have resulted in global food price spikes, have also triggered food insecurity. The impact of conflict on hunger has been quantified to be significant (e.g., Gates and others 2012).⁴ Similarly, good and participatory governance has been linked to the reduction of acute food deprivation (Sen 1999). Many countries have thus sought to improve conditions along these and other institutional determinants of hunger to bring about significant advances to SDG2.

³ On the other hand, they cannot account for interactions between the spending areas (which may lead to an overestimate) and assumes efficient spending (implying a potential underestimation, all else equal).

⁴ They establish causally that on average, five years of conflict—even with moderate direct casualties—leads to an additional 3-4 percent of the affected population suffering hunger.

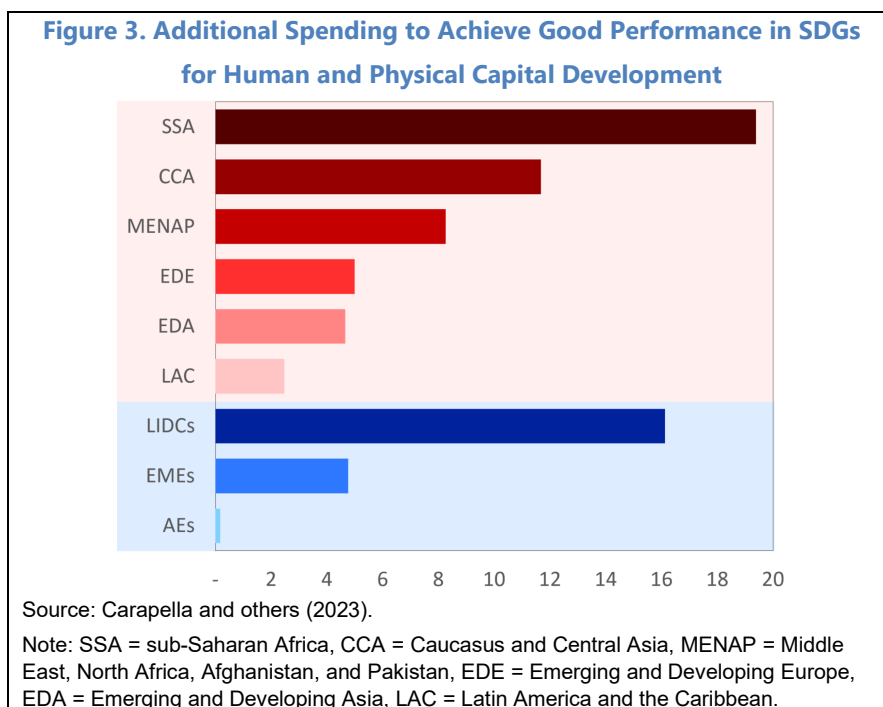
10. Eradicating extreme poverty would require an additional 0.08 percent of GDP. SDG1

calls for the eradication of extreme poverty (currently defined as living on less than \$2.15 a day) by 2030. In addition, SDG1 seeks to halve the share of the population living below countries' national poverty lines by that year. The world has experienced a steady reduction in extreme poverty over the past four decades and eliminating such deprivation by 2030 is not fully out of reach. However, the pandemic has made this achievement distinctly harder, having caused a rise in the number of extremely poor by over 65 million in 2020 (Figure 2). The additional spending to close the extreme poverty gap is estimated at 0.08 percent of global GDP, or \$81 billion—of which \$50 billion arise in sub-Saharan African LICs (IMF 2024).⁵

**B. Beyond Hunger and Extreme Poverty****11. Beyond addressing hunger and poverty, the world needs to muster significant additional resources to meet core needs in SDGs for human and physical capital development.**

The IMF recently updated previous estimates (Gaspar and others 2019) of the additional spending needed to achieve a good performance in building human capital through services in health (SDG3) and education (SDG4) and physical capital (water and sanitation, electricity, and road infrastructure, as parts of SDGs 6, 7, and 9, respectively). The new estimates (Carapella and others 2023) conclude that the world—including both private and public sectors—would need to spend an additional annualized \$3 trillion, or 3.4 percent of 2030 GDP, to do well in these SDGs. When also accounting for the additional cost to address climate mitigation goals and adaptation needs in these SDGs for health, education, and infrastructure sectors, the additional annualized cost rises to 3.8 percent of global GDP (Aggarwal and others 2024). The additional cost of achieving the core outcomes in the five SDGs is most significant for LIDCs, at 16.1 percent of their GDP, while more moderate for EMEs and minor for AEs (4.8 and under 0.2 percent of their GDP, respectively) (Figure 3).

⁵ Closing the poverty gap when accounting for different minimum needs across income groups would significantly increase these costs, see IMF (2022). Note also that the calculation assumes perfect identification of the poor; the extent of their poverty; and the ability to deliver resources to them. Imperfections in implementation increase costs.



12. There are also wide-ranging differences across regions in the additional spending to do well in the SDGs. Sub-Saharan Africa has, by far, the largest additional spending need—at 19.4 percent of GDP (Figure 3). This is followed by the Caucasus and Central Asia, with an average additional spending requirement of 11.7 percent of GDP. Besides AEs, the region with the lowest additional spending needs is Latin America and the Caribbean at 2.5 percent of GDP.

INTERNATIONAL TAX COOPERATION

13. This section considers reforms that are either being implemented at the international level or would benefit from enhanced international cooperation. The reforms are not necessarily recommended or endorsed by the IMF. Rather, the section offers an assessment of alternative reforms that are being discussed internationally. In some areas—such as corporate taxation—international agreements are already in place and the questions considered relate to their impact and the next steps. In other areas, there is so far no consensus on proceeding with closer cooperation.

A. Multinational Enterprises

14. During the last decade, the international corporate income tax (CIT) system has come under significant strain for several reasons:⁶

⁶ IMF (2019a, 2023) and De Mooij, Klemm, and Perry (2021).

- **Profit shifting.** Substantial profits are shifted from countries and reduce their tax base. Estimates vary, with some suggesting that $\frac{1}{3}$ of multinational profits are shifted to low-tax jurisdictions (e.g., Tørsløv, Wier, and Zucman 2023; Clausing, 2020), although others pointing to lower magnitudes (e.g., Dharmapala, 2014). Developing countries are found to be more prone to profit shifting (Fuest, Hebous, and Riedel 2011; Crivelli, De Mooij, and Keen 2016).
- **Tax competition** is potentially even more costly (Crivelli and others 2021). For developing countries, tax competition often manifest itself in ineffective and inefficient tax incentives (IMF 2022, 2023). Estimates suggest that with a 10-percentage point increase in the difference between the statutory CIT rate and the preferential rate of the incentive regime, CIT revenue declines by around 0.35 percent of GDP (Kronfol and Steenbergen 2020).
- **Developing countries** face distinct problems due to complexity of the system in light of capacity limitations. They may also face restricted taxing rights in certain bilateral tax treaties.
- **Digitalization** creates new perspective on the reliance of taxing rights on physical presence and the unremunerated acquisition of data from customers.

Initiatives to Strengthen International Taxation of Multinationals

15. The 2015 G20-OECD Base Erosion and Profit Shifting (BEPS) initiative introduced minimum standards and common approaches to tackle profit shifting mainly through stricter anti-tax avoidance rules and enhanced transparency. Examples include a rule to limit interest deductibility, inclusion of passive income of a controlled foreign company in the tax base of the residence country, combatting tax treaty abuse, and information reporting requirements for multinationals on a country-by-country basis. While the BEPS initiative addressed profit shifting, it did not cover tax competition over real investment decisions, although the peer review of preferential tax regimes (Action 5) represented a first step in this direction.

16. The 2021 Inclusive Framework agreement goes further by introducing a minimum CIT, which lowers both profit shifting and tax competition. The minimum effective tax rate (Pillar Two of the Inclusive Framework) is set at 15 percent and collected through three interrelated rules that allow the source, residence, and other countries of operation of the multinational group to levy top up taxes—hence ensuring that the minimum tax applies even to countries that do not adopt it. IMF staff estimate its revenue gains as follows:

- *A direct global CIT revenue gain* of roughly 5.7 percent⁷, through the top-up tax that is collected from profit that is currently taxed below the agreed minimum.⁸

⁷ This estimated direct revenue impact is similar to estimates by others. Hugger and others (2024) obtain a slightly higher figure of 6.5-8.1 percent of global CIT revenues. The difference is due to a different sample period and somewhat different assumptions about unobserved profits currently taxed below the minimum tax (see also IMF, 2022; IMF, 2023).

⁸ Without the substance-based income exclusion, this estimate would increase to 7.6 percent.

- *An additional gain from mitigated tax competition between countries, potentially raising global CIT revenues by an extra 8 percent if countries halt and slightly revert the downward trend of the CIT rates.*
- *A gain from reduced profit shifting by the largest multinationals, potentially raising global CIT revenues by another 1 percent.*

17. The Inclusive Framework agreement includes additional elements of importance for developing countries, although with limited direct revenue impact. Notably, simplifications in determining the transfer price between related parties (Amount B under Pillar One) would assure revenue to source countries at relatively low administrative cost. The subject-to-tax rule under Pillar Two allows source jurisdictions to impose limited source taxation on certain related-party payments subject to tax below a minimum statutory rate of 9 percent. Its revenue impact is likely limited though (IMF 2023).

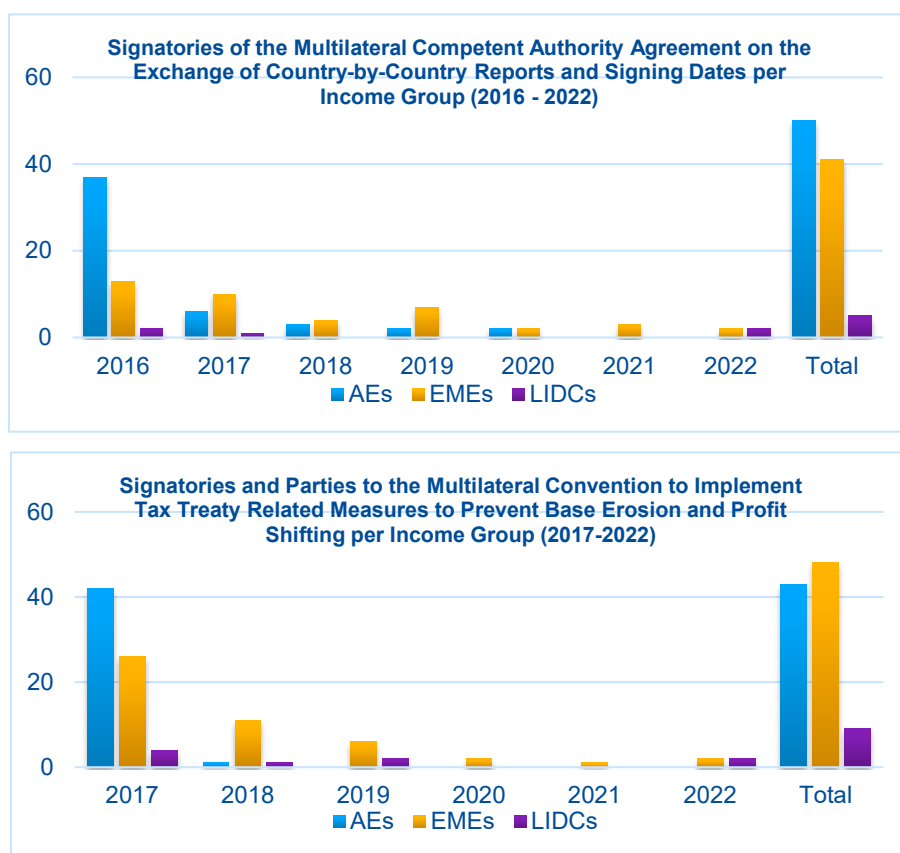
18. Taxing multinationals' excess profit (defined as profits above the opportunity cost of investment) could yield sizable revenue. An excess profit tax has the merit of being non-distortionary for financing and investment decisions—which is a key concern with the traditional CIT. If implemented unilaterally, however, an excess profit tax would face the same profit shifting and tax competition risks as the ordinary CIT. Coordination on an excess profit tax, possibly by building on the residual profit in Amount A of Pillar One or on the covered tax under Pillar Two, could raise significant revenue. To illustrate, Hebous, Prihardini, and Vernon (2022) find that a hypothetical global excess profit tax of 10 percent would raise global CIT revenue by more than 15 percent.⁹

International Tax Administration

19. New international tax measures take considerably longer time for developing countries to implement. Figure 4 illustrates the staggered nature of implementation across country groups. For instance, while advanced economies have swiftly put in place the necessary (domestic and international) legal arrangements to share country-by-country (CBC) reports, the legal implementation was somewhat slower in emerging market economies and much slower in low-income developing countries. Data on the breakdown of signatories to the BEPS Multilateral Instrument show a similar pattern.

⁹ A coordinated approach can take the form of imposing an excess profit tax on the globally consolidated profit of the multinational group (which would shield against profit shifting) with an apportionment formula that allocates excess profit to countries (similar to Pillar One). A higher share of sales in the allocation formula would reduce tax competition, while source taxation calls for including factors of production such as employment.

Figure 4. Signatories of International Tax Agreements



Source: 2023 IMF staff estimates based on OECD data: Signatories and Parties (MLI Positions); Signatories of the Multilateral Competent Authority Agreement on the Exchange of Country-by-Country Reports.

20. Even when new measures are implemented, developing country tax administrations struggle with effectively utilizing them. Thus, changes in legislation do not necessarily result in higher short-term revenue collection. For example, IMF survey data shows that the chance of a successful tax assessment following an information exchange is considerably higher for advanced economies than for low-income developing countries (IMF 2022). The latter face difficulties both in translating the exchanged information into actionable intelligence as part of the compliance risk management process and in planning and effectively executing the necessary compliance actions (including audits).

21. Measures could be taken to enhance administrative cooperation for the benefit of developing country tax administrations. Capacity development could strengthen basic international tax capacities, such as the core and supporting administrative functions, reform and international tax compliance risk management, and auditing cross-border transactions. Countries could also benefit from tailored simplified anti-avoidance rules, such as alternative minimum taxes,¹⁰ safe harbor rules, deduction limitations on a wider set of payments, and withholding taxes (IMF

¹⁰ For a discussion and revenue estimates see Aslam and Coelho (2021).

2023). Expansion of the reforms under the two pillars (e.g., by reducing thresholds or removing the substance-based income exclusion) or more fundamental simplifying reforms (such as wider application of formulary methods) can benefit them. Enhanced regional cooperation can further address regional profit shifting and tax competition. It could also be agreed that advanced economies would automatically provide information to low-capacity countries to support their enforcement, e.g., concerning beneficial ownership data of corporate and similar entities and reports received under mandatory disclosure rules.

B. Wealth Taxation

22. Wealth in the form of assets/capital can be taxed in various ways:

- Wealth taxes—sometimes more precisely labeled “net wealth taxes”—are directly applied on the stock of net wealth, that is, assets minus liabilities.
- Capital income taxes are applied to the returns on wealth, such as interest, dividends, and capital gains.
- Wealth transfer taxes apply when wealth is passed on as a gift or bequest. These taxes include estate, inheritance, and gift taxes.

23. Generally, net wealth taxes are less efficient and equitable than capital income taxes.

Wealth taxes can be seen as taxing an assumed fixed return on the stock of wealth, which might be interpreted as a normal return. Consequently, wealth taxes leave supernormal profits untaxed. Efficiency would in contrast call for taxing lightly the normal return (which determines savings decisions) and taxing more heavily any supernormal returns. Capital income taxes do that as they apply to the actual return on wealth. Moreover, from an equity perspective, the wealthiest individuals who have access to the best advice likely enjoy systematically higher returns, thus being better off if wealth is taxed instead of capital income.¹¹

24. Existing wealth taxes yield little revenue. Most countries collect considerably less than 1 percent of GDP, except Switzerland that has no capital gains tax making the wealth tax somewhat a substitute (**Error! Reference source not found.**). The low yield and impact of wealth taxes in practice has led many countries to abolish them—in the OECD, of the 12 countries that applied explicit wealth taxes in the 1990s (OECD 2018), only 3 remain.¹²

¹¹ For a more detailed discussion—including counterarguments—see Hebous and others (2024).

¹² The Netherlands has been effectively taxing wealth through an explicit tax on presumptive returns. The system is due to be transformed into a capital income tax in 2026, after Dutch Supreme Court in December 2021 ruled that it violates taxpayers’ fundamental rights.

Country	Rates (percent)	Revenue (percent of GDP, 2018–20 average)
Algeria	0–1	...
Argentina	Domestic assets: 0.5–1.25; foreign assets: 0.7–2.25	0.34
Bolivia	1.4–2.4	0.085 ^a
Colombia	Since 2022: 0.5–1.5; From 2027: 0.5–1	0.08
Liechtenstein	Product of a standard return rate and the income tax rate (of up to 28%)	...
Netherlands	0.37–2.17 percent (product of a notional return of 1.03–6.04 depending on the amount of wealth and a tax rate of 36%)	...
Norway	1.1	0.56
Spain	Varies by region, typically 0.2–3.5	0.19
Suriname	0.3	...
Switzerland	0.01–1, varying by canton/municipality	1.4
Uruguay	Residents: 0.1–0.4; nonresidents: 0.7–1.5	0.9
Venezuela	0.25–1.5	...

Source: IMF staff compilation using PwC, IBFD, and EY tax guides.
^a Figure for 2021

25. Taxes on wealth and capital income suffer from tax evasion. Wealth and, to a lesser extent, its owners are internationally mobile. To prevent the simplest form of avoidance by investing wealth elsewhere, most countries tax residents on their worldwide capital income or wealth. However, undeclared foreign assets are difficult to monitor and therefore prone to evasion risk. While estimating evasion is challenging, there have been various attempts. Studies typically find that hidden untaxed offshore wealth is around 9–10 percent of GDP (Zucman 2013, Alstadsæter, Johannesen, and Zucman 2018). Hebous and others (2024) conjecture that the associated tax revenue loss would be around \$150 billion globally.

26. Effectively taxing wealth requires international administrative cooperation. The Global Forum on transparency and exchange of information, with 171 members, and the common reporting standard are important steps in this direction. Estimates by the EU Tax Observatory (2023) suggest that hidden wealth has recently fallen from 9 to 3 percent of GDP, which likely reflects the impact of the new automatic exchange of information standard. Menkhoff and Miethe (2019) report a reduction of bank deposits in low-tax jurisdictions by 11–38 percent and of portfolio investment by 21–29 percent. Yet, the gains for developing countries might still be relatively small, given that they hardly use the information in light of capacity constraints (IMF 2022). Moreover, some forms of evasion remain. For instance, investors may use citizenship-by-investment programs to circumvent information reporting (Langenmayr and Zyska 2023) or shift into assets that are not covered, such as real estate. Relocation of owners' residences are less common, but harder to prevent, although exit taxes can help. Tax competition over residence or citizenship of wealthy people could be mitigated by agreeing on a minimum global tax. However, such an agreement would face formidable challenges in defining an agreed tax base and would not address avoidance opportunities in the form of splitting wealth among family members.

27. Recent proposals focus on wealth taxes that are limited to the “superrich,” raising somewhat different issues. Such proposals have very high thresholds and apply in addition to, not instead of, capital income taxes. They address the main drawback of existing systems of capital gains taxation, which is tax deferral until realization. One might assume that with such high thresholds, administrative and compliance costs, as well as liquidity concerns, are much less relevant than for more general wealth taxes. High thresholds also imply smaller risk of affecting most entrepreneurial activity or innovation, as very few people would be covered. Finally, restricting such tax to extreme wealth, allows in principle designing it in a way that implies capital income tax rates exceeding 100 percent, thereby reducing wealth slowly toward the threshold unless supernormal returns keep being earned.

28. The revenue from a wealth tax on the superrich will depend on its design (rate and threshold) and behavioral responses. Given the absence of any precedent, the impact of such proposals on incentives is hard to gauge. Saez and Zucman (2019) analyze a proposal for the United States by Senator Warren, which was to tax wealth above \$50 million at 2 percent, and wealth above \$1 billion at 3 percent. They estimate revenue of about 1 percent of US GDP per year. However, Sarin and Summers (2019) expect revenue to be 40 percent lower due to more tax avoidance and evasion. This illustrates that the revenue effects depend critically on the assumed elasticity of reported wealth with respect to tax rates. Studies estimating these elasticities for individual countries suggest that behavioral responses are indeed important, but the size of these responses varies significantly between studies (for example, Londoño-Vélez and Ávila-Mahecha (forthcoming) for Colombia and Jakobsen and others (2020) for Denmark) and estimates may not carry over to other countries and tax designs.

29. A globally coordinated wealth tax on the superrich could mitigate the risk of base erosion. Tax evasion and avoidance would be muted if countries would coordinate the introduction of a tax on wealth. Abstracting from any behavioral response, the EU Tax Observatory (2023) estimates the revenue from a 2-percent wealth tax on the world’s top 2800 billionaires (30 percent of whom are in the United States). They find it would have raised about \$250 billion (a little over 0.2 percent of world GDP) in 2023. If it is turned into a minimum tax (with credits provided for income taxes already paid by these billionaires), revenue would still be slightly more than \$200 billion. These estimates are upper limits, since they do not allow for a behavioral response or consider the effectiveness of the administration of such a tax. Moreover, the tax would hardly raise any revenue in developing countries. For instance, the proposed scheme would yield less than \$1 billion in Sub Saharan African countries, collected from 11 billionaires.

30. This suggests the following policy implications (see also Hebous and others 2024):

- Effective taxation of capital income is important for the progressivity of tax systems. Where capital income taxes are poorly designed, a neutral treatment of alternative sources of income (interest, dividends, capital gains) can improve revenue performance, as well as vertical and horizontal equity.

- International administrative cooperation in the form of exchange of information is important to address tax evasion and could be expanded further to cover exempt categories (notably real estate).
- While a globally coordinated wealth tax on the superrich might have some appeal, the likely low revenue, especially for developing countries, reduces its relevance for financing the SDGs.

C. Financial Transaction Tax

31. Financial transaction taxes (FTTs) are taxes on the transaction value of financial assets, such as stocks, bonds, currencies, or derivatives. In the case of currencies, they are also known as Tobin taxes. As financial markets are under intense international competition and trading is internationally mobile, unilateral application of FTTs often triggers international tax avoidance or evasion. Some countries apply FTTs to bank account transactions (BTTs). Many countries also tax real estate transactions, but those face comparatively fewer international tax responses due to base immobility.

Pros and Cons of FTTs

32. FTTs clearly reduce trading volume and liquidity in the taxed instruments. They are therefore often proposed to reduce financial market volatility by raising the cost of short-term trading, but both theory and evidence are ambiguous regarding their impact on volatility. While a substantial theoretical literature distinguishes between destabilizing “noise trading” and trading based on fundamental valuation, in practice these two types of trading are extremely hard to distinguish, and studies find both positive and negative relationships between transaction costs and price volatility (Pekanov and Schratzenstaller 2019; Matheson 2012).

33. An advantage of FTTs is their relative ease of administration. Investors’ need to register legal title to real property or other capital assets, thereby enabling FFT collection. Collection is particularly easy in electronic markets.

34. A major disadvantage of taxes on transaction values is their lower efficiency compared to taxes based on economic outcomes, such as profits or capital gains. Economic theory and evidence show that FTTs on securities transactions increase the cost of capital and/or risk diversification to businesses and reduce the net return to investment. This occurs even if initial issuance is exempted, since expected future FTT liabilities capitalize into securities prices, so that more frequently traded securities (notably stocks) bear a heavier burden (Matheson 2012). FTTs also lower the return to savings, making it more difficult for consumers to smooth consumption over time. While income and capital gains taxes also increase financing costs and lower the return to savings, they do so in a more neutral manner by taxing only the net gains (and deducting losses). FTTs, by contrast, impose positive tax even in the event of losses.

35. FTTs are also less equitable than taxes on net income or capital gains, given the weak relationship between gross transaction values and profitability. And depending on market

conditions, at least some of the increased capital costs due to FTTs may be shifted to workers through lower wages or consumers through higher prices.

36. Similarly, FTTs are less efficient and equitable than net wealth taxes. Like wealth taxes, FTTs apply to a gross value rather than the associated net income and can therefore impose tax that exceeds actual income. Unlike a wealth tax, however, FTTs apply only when assets are transferred, and they therefore have lock-in effects that can discourage efficient transactions.

37. BTTs can lead to financial disintermediation through use of cash or other untaxed payments, such as crypto currencies. Since businesses typically use bank balances to pay for transactions, BTTs are equivalent to gross receipts taxes that cascade through the production chain, promoting vertical integration and importation. By contrast, a value added tax (VAT) credits tax on inputs except at the consumer level, so that production is not distorted.

International Aspects

38. FTTs on relatively mobile tax bases would fall short of the intended revenue collection since they will likely give rise to avoidance or evasion. Avoidance occurs where only domestic transactions are subject to tax, while evasion occurs when global transactions are taxable, but the tax is not enforceable when trade takes place elsewhere. The classic example of avoidance is Sweden's 1983 imposition of a 1 percent tax on Swedish share transactions, which caused domestic share trading to migrate to the United Kingdom (Umlauf 1993). Taxing securities traded on official market platforms could displace trading activity to over-the-counter (OTC) channels, with a corresponding loss of transparency and regulatory oversight.¹³

39. Even for less mobile assets, such as real property or natural resources, there are international avoidance and evasion risks. While it is hard to avoid paying a tax on a direct transaction in an asset such as real estate that requires registration, taxpayers can avoid tax by undertaking indirect transactions, for example by selling a company holding real estate (or a natural resource). To prevent such avoidance, countries require complex regulations to collect tax even on indirect transfers of interests (IMF and others 2020).

Revenue Potential

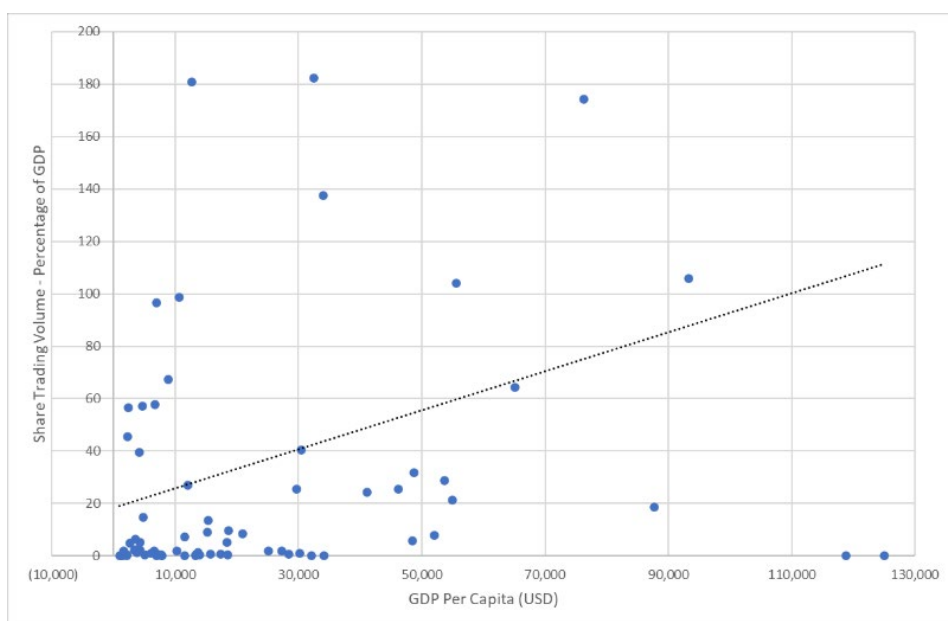
40. Revenues from existing transactions taxes vary widely across countries, even within income groups. On average OECD countries raise about 1.7 percent of total tax revenues and 0.6 percent of GDP with non-recurrent transfer taxes (including those on real property). Transaction tax rates on real property tend to be much higher than on securities, reflecting the relative immobility of the base and infrequency of trading. The most common form of FTT is a 10-50 basis-point tax on

¹³ Brondolo (2011) cites this as an argument against introducing a Tobin tax, which would counteract international efforts to improve regulation of currency trading.

the gross value of listed share trades. In 2023, the United Kingdom’s 0.5 percent stamp duty on shares raised £3.3 billion—about 0.1 percent of GDP.¹⁴

41. Regarding a potential globally coordinated FTT, most of the revenue would be raised in higher-income countries that tend to have more active financial markets. For example, stock market trading (the most common FTT base) varies directly with per capita income (Figure 5). This implies that most FTT revenue would accrue to higher-income countries—although financial market activity within that group also varies considerably.

Figure 5. Share Trading Volume as a Share of GDP and Per Capita Income



Source: World Federation of Exchanges Database accessed through World Bank databank and IMF staff calculations.

42. Levying a global FTT across major trading platforms may reduce opportunities for securities trading to migrate to alternative platforms. Actual evasion rates could thus be lower than those obtained from historical examples of single-country FTTs, although revenue estimates for multi-country FTTs tend to conservatively apply a range of historical rates. Failure of countries with significant financial markets to participate in the regime would likely lead to trading migration and higher tax base elasticity. Levying the FTT on OTC transactions as well as exchange-traded securities would reduce avoidance opportunities, although it would likely increase the cost of administration.

43. IMF staff estimate that a global FTT of 10 basis points on securities (stocks and bonds) and 1 basis point on currencies and security and currency derivatives would raise 0.3-0.4

¹⁴ Office for National Statistics: Public Sector Finances Time Series.

percent of GDP.¹⁵ This is consistent with findings by European Commission (2011) and Pekanov and Schratzenstaller (2019). Experience with existing FTTs suggests that revenues may decline over time as market participants develop avoidance strategies.¹⁶

44. Summing up: FTTs could mobilize revenue—especially for advanced economies and if broad international cooperation can be secured— but create large distortions. Without coordination among all major financial markets, risks of tax avoidance and evasion would be significant. And even if implemented successfully, revenue would be concentrated in advanced economies. Given that FTTs are more distortive and less equitable than taxes on net income or wealth, other revenue-raising options should be favored. BTTs are particularly harmful because of the financial disintermediation and cascading that they cause and should therefore be avoided.

D. International Transportation

45. International aviation and maritime activities are currently taxed relatively lightly from an environmental perspective and the broader fiscal system. Unlike domestic transportation fuels, internationally used fuels are generally not subject to excise taxes that reflect environmental damages in fuel prices. Shipping income generally receives favorable tax treatment, being subject to relatively low “tonnage” taxes rather than normal CIT. International passenger flights are, unlike the generality of consumption items, almost invariably exempt from VAT.

Pricing International Aviation and Maritime Emissions

46. There is a strong case for levying a charge on emissions from international transportation. International aviation and maritime emissions together account for about 5 percent of total greenhouse gas (GHG) emissions. Underlying the current tax-exempt status of international transportation fuels are fears that unilateral taxation would harm local tourism and commerce, undermine the competitiveness of national carriers, raise import prices and/or reduce the demand for exports. Fueling might take place in countries without similar policy measures, so that even the revenue gain might be compromised. To overcome these fears, international coordination is needed, ideally in the form of a globally coordinated price that ensures equal treatment for carriers and nations. Global application of carbon pricing would be straightforward administratively, given oversight of the global aviation and shipping fleets by the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO). These international organizations have

¹⁵ The revenue of an FTT can be estimated using a common mode (see, for example, European Commission (2011)):

$$\text{Revenue} = \text{Tax Rate} \times \text{Trading Volume} \times (1 - \text{Evasion Rate}) \times \left(1 + \frac{\text{FTT Rate}}{\text{Total Transaction Costs}}\right) \varepsilon,$$

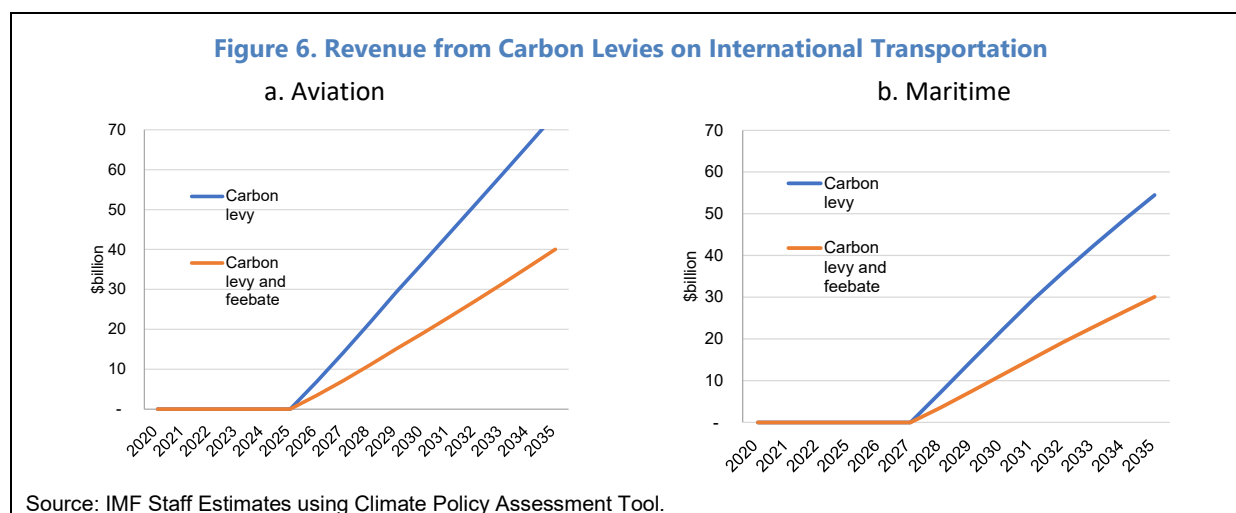
where ε is the elasticity of trading volume with respect to transaction costs, which various studies estimate as ranging between 0.5 and 2 (European Commission 2011). Evasion rates, which depend on the breadth of the base (e.g., whether OTC trading is included) as well as administrative capacity, are typically 10–20 percent for securities (stocks and bonds) and higher for derivatives. Pretax transaction costs are typically less than 10 basis points in recent studies. Tax rates applied to the notional value of derivatives are typically an order of magnitude smaller than those applied to securities to preserve relative investment costs across the two markets.

¹⁶ This is particularly the case with BTTs. See for example Baca and others (2006).

also recently established capacity for monitoring operators' fuel use and emissions so this could become a truly global tax without the intervention of national authorities.¹⁷ The administrative design could draw lessons from the existing International Oil Pollution Compensation Funds (IOPC 2024), which pool mandatory payments from seaborne oil purchasers into an international fund for pollution insurance. The allocation of revenues across countries needs to be internationally agreed, and could be based on climate impact, economic impact of the levies, or other factors including supporting better technologies to lower CO₂ emissions in the sector (Keen and others 2013).

47. Moderate carbon prices could raise substantial revenue from the sector. For illustration, a pure carbon levy of \$50 per tonne CO₂ in 2030, rising to \$100 per tonne in 2035 would increase average aviation ticket prices by around 10 percent and the average price for shipped products by around 1 percent in 2035. It would raise annual global revenues of \$80 billion from aviation and \$50 billion from maritime in 2035 (Figure 6).

48. Carbon pricing could be combined with feebates—a sliding scale of fees/rebates on operators with emission rates (e.g., per tonne km for shipping) above/below a pivot point. Feebates have smaller impacts on transportation costs than pure carbon levies and do not, on net, raise revenue when the pivot point reflects the average emission rates of the global plane or shipping fleets. Combining a feebate with a carbon levy may achieve a robust price while also striking a balance between raising revenue and limiting disagreements over revenue use, the need for compensation schemes, and industry opposition. A carbon levy of \$25 per tonne CO₂ in 2030 (combined with a feebate to maintain the equivalent combined price signal) raises global revenue of about \$45 billion from aviation and \$30 billion from maritime in 2035 (Figure 6). Revenues could be used, at least in part, to provide compensation to developing countries for the rise in trade costs.



¹⁷ For international aviation, legal issues loom, however, as the current fuel tax exemptions are built into multilateral agreements within the ICAO framework and bilateral air service agreements, which operate on a basis of reciprocity.

Addressing Taxing Rights and Tax Competition

49. Profits from international shipping and air transport have traditionally been taxed differently from—and often more favorably than—other business profits. Such profits are typically taxed exclusively in the residence state of the enterprise and exempt from taxation elsewhere, irrespective of where transport activities are carried out. In the maritime sector, this has led to tax competition, with some countries offering “open” ship registries¹⁸ with very low taxation, including “tonnage tax”¹⁹ regimes, which in response are now offered in countries that host significant shares of global shipping enterprises, which has led to very low effective CIT rates.²⁰ ITF (2019) estimate the total tax expenditure associated with tonnage tax regimes in OECD countries at €1.1 billion in 2015, with the largest tax expenditures from tonnage taxes arising in Germany, Japan, the United Kingdom, the Netherlands and France.

50. The traditional justifications given for the special tax treatment of international transport profits appear less convincing today. International transport is said to be an inherently mobile activity and raising conceptual difficulties in determining appropriate levels of taxation in every jurisdiction involved in global transport networks. Taxation in multiple jurisdictions would also create unjustifiably large compliance requirements. However, these challenges appear no less difficult than those posed by highly digitalized businesses, in particular those relying heavily on unique intangibles. In fact, these challenges now appear comparatively less daunting, given the inherently more physical nature of the air and maritime transport industry, which is also subject to global oversight (see above).

51. The Inclusive Framework agreement provides for some rebalancing of taxing rights on international transport profits, but its implementation is uncertain. Amount A of Pillar One applies to shipping and aircraft profits, albeit only of the largest multinationals, very few of which are engaged in the international transport business. Implementation of Amount A would therefore be a first step in reallocating some taxing rights to destination countries. If this fails, there may be room for a UN-led process building on ongoing discussions in the UN Tax Committee to revise Article 8 (Alternative B) of the UN Model Convention on international transport, which could in turn build on the sourcing rules developed in the draft MLC to implement Amount A.

¹⁸ Ship registration determines a ship’s nationality (its “flag”) as the country that exercises regulatory control and oversight over the vessel (for instance, with respect to its safety, crew, and environmental requirements). Some countries operate “open” ship registries with limited or no requirements as to the nationality or residence of the ship’s (ultimate) owners and crew and are often associated with more lenient regulation and oversight (sometimes referred to as “flags of convenience”). Countries with “closed” registries, on the other hand, only register vessels that are owned and crewed by nationals or residents of the jurisdiction.

¹⁹ A tonnage tax regime is a specific tax on eligible shipping companies in lieu of the normal CIT, calculated by reference to the net tonnage of its ships irrespective of the companies’ actual shipping profits. The regime is usually conditional on (some share of) the beneficiary’s fleet being flagged in the taxing jurisdiction (see hereafter on shipping registers and flags).

²⁰ IMF (2023) cites a study finding effective tax rates of 7 percent for the largest operators in the sector; others cite lower numbers; see [Sea-Intelligence - 2021: Significant tonnage tax advantage](#).

52. The Inclusive Framework agreement does not put a floor on tax competition for shipping profits, which are carved out. This is intended to broadly preserve the effectiveness of countries' tonnage tax (or other preferential shipping) regimes. The proliferation of tonnage tax regimes is therefore likely to continue in the short term, with most recently Switzerland contemplating introducing such a regime, while the race to the bottom continues even amongst countries that already have a tonnage tax regime.²¹ Putting a floor on competition for shipping profits would require extending the global minimum tax to shipping profits, potentially starting at a lower minimum ETR than under current rules.

Extending VAT to International Passenger Transport

53. Most countries' VATs do not currently cover international transport services. This implies under-taxation of international passenger transport consumed by individuals (transportation services used by businesses are effectively covered in the next stage of the value-added chain).

54. The current non-taxation of international passenger transport is largely customary. Given that most countries tax domestic (including air and ship) transport—albeit sometimes at reduced rates, and with further concessional treatment for public transport—this distorts consumer choices and competition. There are no international law impediments on countries to impose VAT on international passenger transport.²² However, international guidance on how to impose and collect VAT on international transport is currently scarce given widespread zero-rating or exemption.²³

55. Imposing VAT on international passenger transport could raise significant revenues. VAT on airlines tickets could raise \$277 billion per annum, assuming a flat 10 percent rate, a worldwide average ticket price of \$749, with 3.7 billion passengers in 2022. On the other hand, existing ticket taxes and charges, in particular where they are in the nature of a general tax rather than fee for service, may need to be reconsidered to take account of VAT imposition.

E. Carbon Pricing

56. Carbon pricing is promising as a policy to support decarbonization and mobilize revenue. Getting on track with limiting global warming to 1.5-2°C, as agreed in Paris in 2015,

²¹ For instance, by expanding the activities that can benefit from the regime, resulting in lower effective tonnage tax rates under newer compared to older regimes, or under existing regimes following changes made over time; see ITF (2019).

²² Similarly, within the EU, the non-imposition of VAT on international (including intra-EU) air passenger transport is based on individual derogations given to Member States, which could be forfeited.

²³ The OECD VAT/GST Guidelines—the only existing international standard on applying VAT/GST to cross-border services—are largely silent on this issue. Recognizing the practical difficulties in assigning taxing rights on international travel services to countries in proportion to distance travelled (i.e., place of performance), they leave countries the option to choose more appropriate approaches. These could include taxation in the country of the consumer/passenger, the country of departure, or partly in the country of departure and partly in the country of arrival. Experience with simplified systems to collect VAT/GST from non-resident suppliers is also increasing.

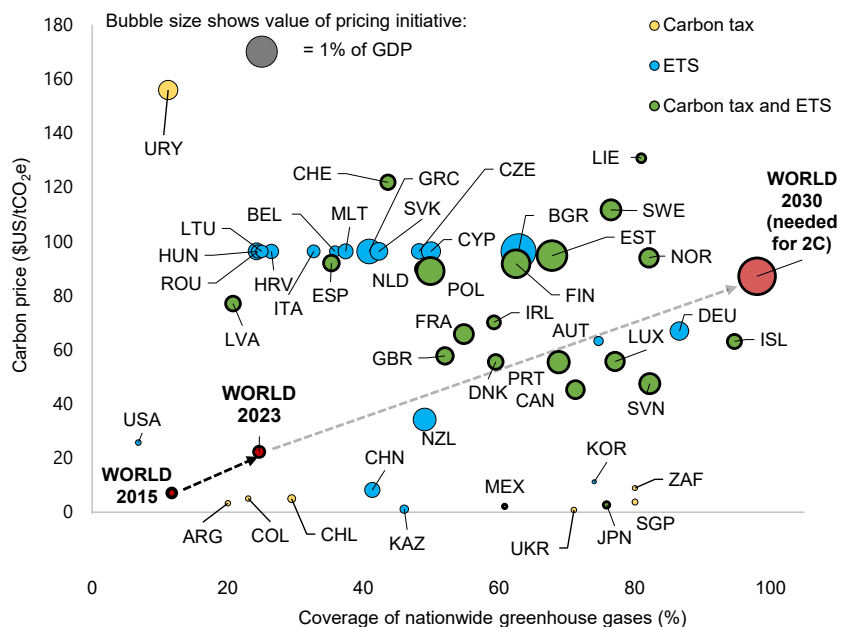
requires reducing global GHG emissions by 25-50 percent below 2019 levels by 2030.²⁴ Carbon pricing is the most efficient instrument for making headway on limiting global warming as it cost-effectively promotes the full range of behavioral and technological responses for reducing emissions. It also mobilizes significant revenue during the transition, which can be especially appealing in countries where high informality or noncompliance hinders revenue mobilization from broader taxes. Ideally, pricing should cover carbon dioxide (CO₂) emissions from power generation, transport, industry, and buildings—some form of pricing can also be feasible for forestry, agriculture, and (methane leaks from) extractives, although emissions monitoring is more challenging for these sectors. Carbon price trajectories can be aligned with meeting emissions commitments—and a clear, credible, and rising price signal incentivizes innovation and adoption in low-emissions technologies. Distributional concerns will need to be addressed, for example, through using a portion of revenues to compensate low-income and other vulnerable households. In the absence of international cooperation, competitiveness impacts for industries in global markets (like steel, cement, chemicals, agriculture) may need to be addressed, although evidence on the extent of impacts is mixed (Keen and others 2021), for example through recycling revenues to the sector or combining pricing with carbon border adjustments, which would also protect against emissions leakage.

57. Carbon pricing can take different forms. The two most important ones are an explicit price or tax on CO₂, and an emissions trading system (ETS) that keeps the price flexible but requires firms to purchase allowances for their emissions and caps the total quantity of allowances (Parry and others 2022). Carbon taxes are attractive as they can provide certainty over future prices, revenues accrue automatically to the general budget, and—in the form of charges on the carbon content of fuels—they easily build off existing fuel tax collection, which is well established in most countries. ETSs also have their own appeal as they help achieve emissions targets with more certainty and allocating some allowances for free can build political support. Design features can help ETSs mimic some of the attractions of carbon taxes, for example price stability mechanisms like price floors and allowance auctions to mobilize revenues—though in practice carbon taxes tend to raise more general revenue than an ETS for a given carbon price (Carl and Fedor 2016).

58. Carbon pricing schemes continue to proliferate, having doubled in coverage of global GHG emissions since 2015 (Figure 7). As of end 2023, 73 carbon pricing schemes were operating in 47 countries, covering 25 percent of global GHGs. At the national level, there are 30 carbon taxes and nine ETSs, as well as the EU ETS. Many subnational pricing schemes are also operating, the largest being California's ETS. The coverage of national emissions from pricing schemes varies substantially, from below 30 percent in some cases to more than 70 percent in others. And price levels in schemes vary from below \$5 to over \$100 per tonne. At the global level, the average price across schemes has grown from \$7 per tonne in 2015 to over \$20 in 2023 though the global price (across priced and unpriced emissions) remains a modest \$5 per tonne.

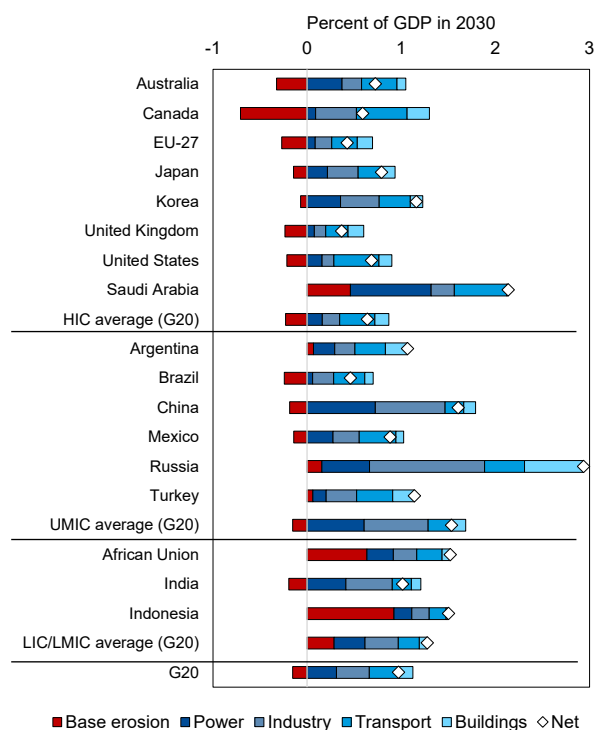
²⁴ Black and others (2023), UNEP (2023), UNFCCC (2022).

Figure 7. Carbon Pricing Schemes at National, Sub-National, and Regional Level, 2023



Sources: Black and others (2023) using WBG (2023).

59. Carbon pricing could mobilize significant revenue. Potential revenues for a \$75 carbon price in high-income countries are around 0.4-1.0 percent of GDP in 2030, accounting for the loss of pre-existing fuel tax revenues. For middle-income countries revenues from a \$50 carbon price are typically around 0.5-1.5 percent of GDP; and for low-income/lower middle income countries revenues from a \$25 price are around 1.0-1.5 percent of GDP. For a given carbon price, revenues raised as a percent of GDP will tend to be higher in countries that produce more CO₂ emissions per dollar of GDP. In dollar terms, potential additional annual revenue under the carbon price scenarios described here would be in the order of \$1.2 trillion for G20 countries and around \$1.4 trillion globally by 2030 (or 1.1 percent of global GDP). Finally, the share of revenues raised from different sectors varies across countries, but power, industry or transport contribute the most and buildings usually the least (Figure 8). Ultimately, the transition away from carbon will erode the revenue base of the carbon tax. Moreover, the transition toward electric vehicles will eliminate revenues from fuel taxes (reflected in the red bars in Figure 8).

Figure 8. Revenues from Carbon Pricing, G20 Countries 2030

Source: Authors using Climate Policy Assessment Tool. Note: Estimates are for carbon prices of \$75, \$50, and \$25 per tonne of CO₂ in high-income countries (HICs), upper middle-income countries (UMICs) and low income/lower-middle income countries (LIC/LMICs). They account for base erosion for pre-existing fuel taxes/subsidies indicated by the red bars (as carbon pricing reduces fuel use; base erosion is driven by the reduction in CO₂ due to the demand response (it can be positive if there are pre-existing subsidies that are eliminated). Averages are weighted by GDP.

60. An international carbon price floor (ICPF) could complement and reinforce the Paris Agreement (Parry and others 2021). Carbon pricing is more difficult when countries act unilaterally due to competitiveness concerns and uncertainties over policy actions in other countries. International coordination can reduce such concerns and therefore add to the appeal of carbon pricing. The ICPF would focus on a small number of large emitters to facilitate negotiation while still covering the bulk of global emissions (for example, the G20 is about 80 percent of global emissions). And countries would be required to achieve whichever is the more stringent of a minimum carbon price and their current emissions commitment. To address equity issues, the agreement would include financial support for low-income countries and prices would be differentiated according to development level, but scaled overall to align global emissions with temperature goals—for example, IMF staff proposed minimum prices of \$75, 50, and 25 per tonne of CO₂ for high, middle, and low income countries by 2030, as reflected in Figure 8.²⁵ Countries would also have the flexibility to use other instruments as long as they achieved the same emissions outcome as they would have

²⁵ Since emissions have continued to rise, a 2C aligned carbon price that is differentiated by income group is now estimated to be substantially higher at around \$145, \$90, and \$35 per ton in high, upper-middle, and low and lower-middle-income countries, respectively. The global weighted average would be \$90. See Black and others (2024).

under the pricing requirement. The Agreement might initially cover emissions from power and industry (which usually account for the bulk of low-cost mitigation opportunities) and could subsequently be extended to other energy sectors. As all countries move ahead on mitigation policies it seems inevitable that groups of countries will start to coordinate over mitigation policies at some point in some form and mechanisms like the ICPF provide a potential framework for this.

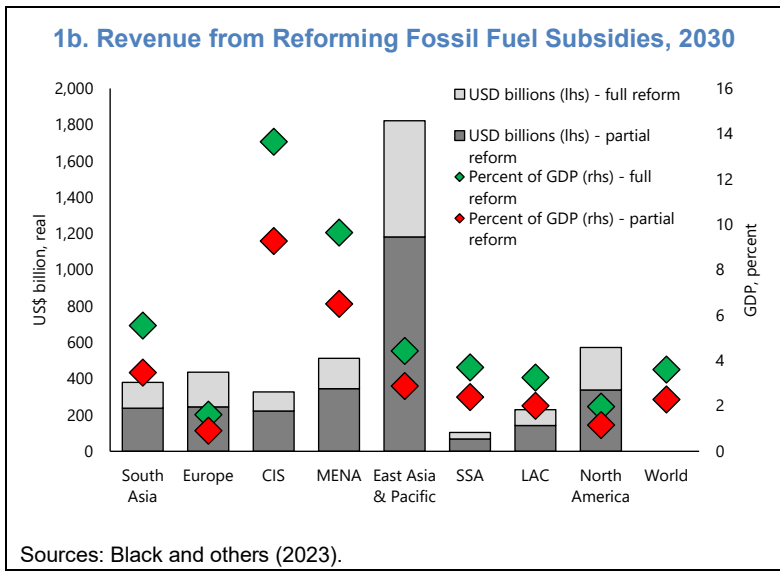
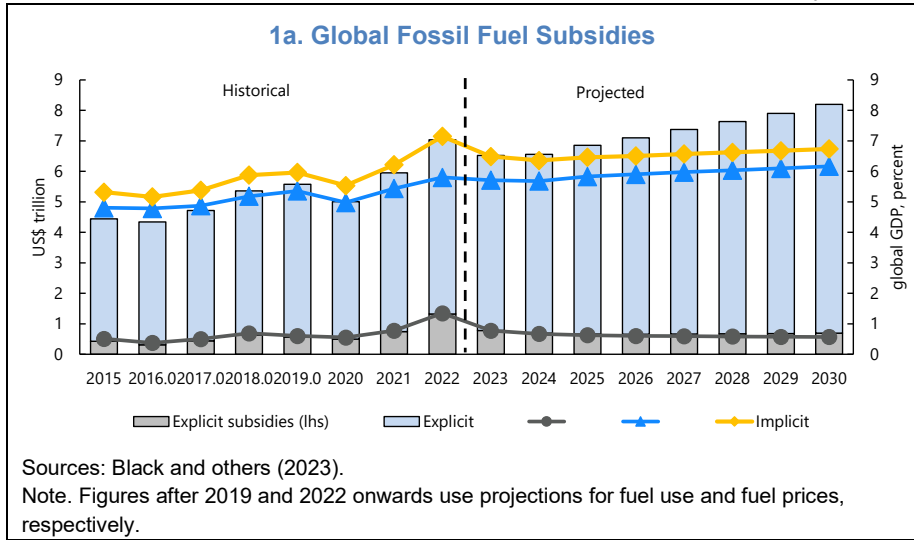
61. A minimum ICPF coupled with a revenue sharing scheme to compensate poorer countries can align climate initiatives with broader development objectives. Under such a scheme, carbon prices could be collected by individual countries based on their own emissions at the source, with compensation to poor nations by wealthier counterparts through financial transfers. The scheme could be based on the idea that each global citizen has equal property rights to the global common. The transfers would then depend on the difference between a country's emissions (on an origin basis) and the global average. Countries with emissions per capita below the global average (typically poorer countries) would emerge as net receivers, while those with higher emissions (usually advanced economies) would become net payors. Illustrative simulations show that under a \$25 per tonne carbon tax in 2030, approximately \$230 billion would be transferred to low- and lower-middle income countries, as they feature carbon emissions per capita below the world average (Black and others 2024).

Box 1. Reforming Fossil Fuel Subsidies

Global fossil fuel subsidies were estimated at \$7 trillion in 2022 or 7 percent of GDP. This is a broadly

defined measure which includes both: (i) explicit subsidies reflecting undercharging for supply costs, which amounted to \$1.3 trillion or 18 percent of the total; and (ii) implicit subsidies reflecting undercharging for (most importantly) environmental costs and (less importantly) general consumption taxation which accounted for \$5.8 trillion, or 82 percent of the total. Environmental costs include not only global warming, but also mortality from local air pollution and various environmental costs from vehicle use like congestion. Going forward, explicit subsidies are projected to decline as emergency price controls and energy tax reliefs introduced during the recent international energy price surge are discontinued, while implicit subsidies are projected to increase without more pricing of environmental costs (1a).

Reforming fossil fuel prices so they fully reflect supply and environmental costs would raise estimated revenues of \$4.4 trillion, or 3.6 percent of global GDP in 2030. This is less than the total subsidy due mainly to the erosion of pre-existing fuel tax bases as fuel prices rise. Revenue gains vary substantially across regions and are especially large (more than 10 percent of GDP) for countries as a group in Middle East and North Africa and the Commonwealth of Independent States (1b).



DOMESTIC REVENUE MOBILIZATION

62. Building tax capacity is essential for development. This is not only due to its role in financing public spending for the SDGs. Taxation is in itself critical in enabling state capacity which in turn is vital to accelerate growth and improve public service delivery. Gaspar, Jaramillo, and Wingender (2016) estimate that once a country crosses a tax ratio of 13 percent of GDP, the likelihood of an acceleration of growth increases significantly. To allow for fluctuations, they argue that countries should therefore aim for a minimum tax-to-GDP ratio of 15 percent to allow the state to fulfill its role in facilitating growth. This section elaborates on how EMDEs can advance their tax capacity through policy and administrative reform.

A. The Untapped Tax Potential

63. Tax revenue in EMDEs has increased during the last three decades, but progress has been uneven and has stalled more recently. The average tax-to-GDP ratio rose by 3.5 and 5

percentage points in, respectively, LIDCs and EMEs since the early 1990 (Figure 9). Some countries have achieved notable increases in tax revenue, including Georgia, Belarus, Argentina, Mozambique, and Nepal—by more than 5 percentage points of GDP. However, much of this progress took place before the 2010. During the past decade, making sustained progress on revenue mobilization has proven elusive. There are, however, significant differences across countries (Figure). Although several countries are collecting less in percent of GDP than in 2010, others have recorded significant revenue increases. Interestingly, there is some degree of convergence within the groups of LIDCs and EMEs, whereby economies with initially lower revenues demonstrate stronger progress. However, on average over 2020-23, there were 43 out of 59 LIDCs and 30 out of 96 EMEs with tax revenues below 15 percent of GDP.

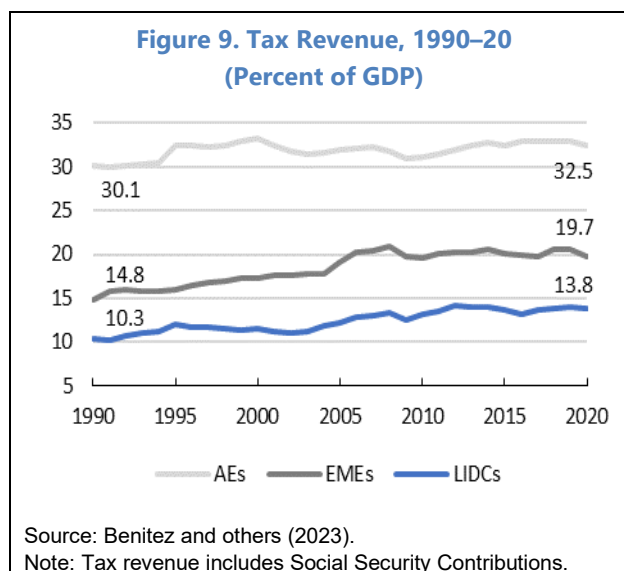
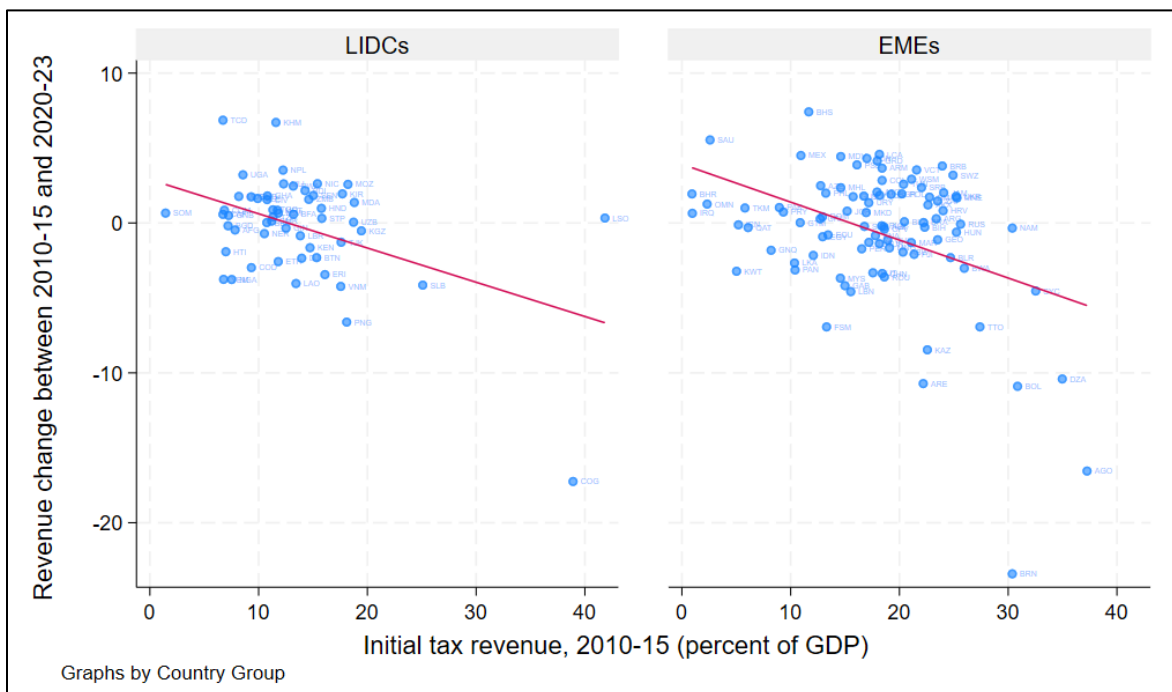


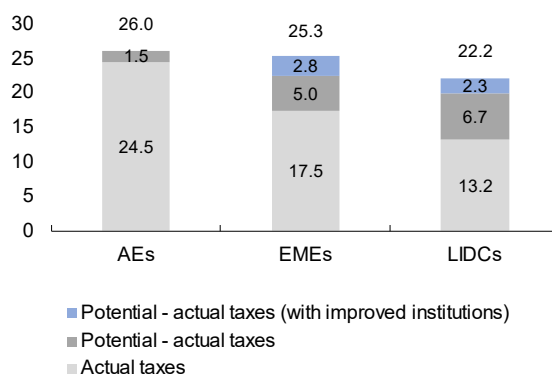
Figure 10. Tax Revenue Changes Relative to Initial Tax Revenue, 2010-2023



Source: WoRLD database.
 Note: The red line is a linear fit.

64. There is considerable untapped tax revenue potential in EMDEs. This potential is defined as the highest level of tax revenue a country can mobilize under comparable situations, based on an empirically determined benchmark observed in other countries (Benitez and others 2023). Compared to current revenue, LIDCs have the potential to raise, on average, 6.7 percentage points in additional tax revenue (Figure 11), while EMEs can raise an additional 5 percentage points. Moreover, if LIDCs managed to improve their institutional capacity to that in EMEs, they could raise their tax revenue potential by another 2.3 percent GDP (and EMEs could raise an additional 2.8 percentage points if institutions improved to the level of AEs).

Figure 11. Actual and Potential Taxes, 2020 (Percent of GDP)



Source: Benitez and others (2023).
 Note: Tax revenue includes Social Security Contributions.

B. Tax Reform Options

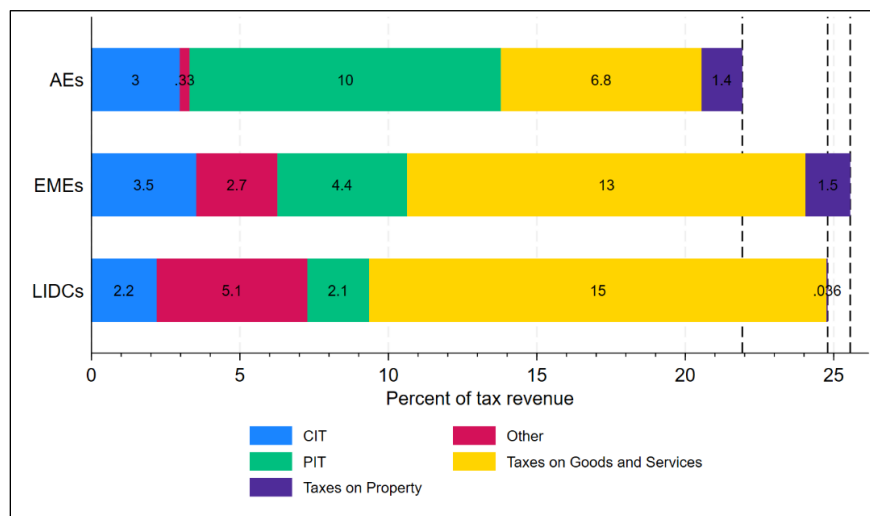
65. Tax system reform can be designed along the lines of the medium-term revenue strategy (MTRS) (see Appendix I). It is grounded in a coherent framework for managing tax system reform, built on strong analysis and institutions and due consideration of distributional and economic implications.²⁶ High-level political support is a prerequisite for successful tax reforms. Experience with successful and large tax revenue mobilization episodes suggests that devising and proactively communicating a comprehensive medium-term tax reform package can be effective. Countries with a revenue increase by more than 3 percentage points over the past decade (not necessarily as part of an MTRS) include for example Armenia, Eswatini, Maldives, Mexico, and Uganda. Progress is typically best achieved by a combination of policy—with a focus on simplification and base-broadening—and administration reforms. These options are discussed further below.

Tax Policy Options

66. Base-broadening. The revenue potential from base broadening can be inferred from tax expenditure assessments, which calculate the revenue foregone from special provisions in the tax code relative to some neutral benchmark system. Figure 12 shows that total tax expenditures are around 25 percent of tax revenue on average in EMDEs. Some tax expenditures can be justified, for example, on the basis of market imperfections or externalities, or if policy goals are most effectively achieved through the tax system. However, tax expenditures often undergo less scrutiny than public expenditures and can easily proliferate. A thorough review of these tax expenditures can identify options for boosting revenue through base broadening (Heady and Mansour 2019; Beer and others 2022).

²⁶ For a discussion of tax policy options for inclusive growth, see, for example, Abdel-Kader and De Mooij (2020) and De Mooij and others (2020).

Figure 12. Estimates of Tax Expenditures



Source: GTED.

Note: Averages over 2012-2021. There are 32 AEs, 45 EMEs and 27 LIDCs in the dataset. Because benchmark systems and estimation methodologies differ across countries, comparing, aggregating, or averaging tax expenditures estimates should be done with caution. At the country level, the most useful and perhaps robust use of these estimates is their trend over time.

67. Curtailing investment tax incentives. Many developing countries have special economic zones or provide tax exemptions through time-bound tax holidays to attract foreign direct investment. However, these incentives are generally found to be ineffective in achieve this goal, while creating significant revenue costs (IMF and others 2015). Indeed, surveys show that investment tax incentives generally rank low in the list of relevant location factors for multinationals and that profit-based tax incentives are often redundant—that is, investment would have been undertaken also without them. Investment tax incentives that directly reduce the cost of investment, such as investment tax credits, accelerated depreciation or outright expensing of investment yield more investment per dollar spent. The global minimum tax will provide an opportunity for EMDEs to rationalize their tax incentives as their effectiveness will be further reduced.

68. VAT reform. More than 160 countries have a VAT system in place, which typically account for around one-quarter of total tax revenue. A VAT has several attractive features that ensure it is ultimately levied on final consumption and collected in various stages—thus reducing collection risks and encouraging voluntary tax compliance. Nevertheless, VAT revenue often falls short of its potential. This can be inferred from the C-efficiency ratio—the ratio of observed VAT collections over its potential, which is computed as the standard VAT rate times total consumption. In 2020, C-efficiency was on average only 0.37 in LIDCs, compared to 0.55 in AEs and EMEs (Benitez and others 2023). For one part, this is due to VAT non-compliance. Indeed, VAT gap estimates by the IMF²⁷ for 32 countries suggest compliance gaps of 50 percent on average for LIDCs (relative to potential), compared to 30 percent in EMEs and 20 percent in AEs. For another part, the revenue shortfall in

²⁷ RA-GAP is an IMF-FAD program to help countries estimate and understand their compliance gaps. Already implemented in a range of EMDEs, the program has initially focused on VAT gaps and is now moving into other major taxes, including PIT, CIT, and excises.

VAT is due to VAT tax expenditures (Figure 12), such as reduced VAT rates and exemptions. These are often motivated by distributional concerns. However, VAT concessions are typically inferior to pursuing redistribution through other tax and spending policies since VAT is poorly targeted for this purpose (IMF 2019b). Exemptions and reduced rates not only reduce revenue directly, but also significantly complicate VAT administration and thus contribute to non-compliance.²⁸ Moreover, in countries with low VAT rates there is scope for raising it.

69. Excise taxes. Excises on alcohol, tobacco, and unhealthy food ('sin goods') are generally motivated by related social concerns—although not strictly speaking externalities (Mansour, Petit, and Sawadogo 2023; Petit and Nagy 2016; Petit, Mansour, and Wingender 2021). Bounded rationality of households and lack of self-control may justify government intervention in the pricing of these addictive commodities. Most countries use excises on these products as part of their policy to improve health outcomes, but revenue raising objectives are important as well. For developing countries, these excises can have special appeal as concentrated production and high import shares make administration relatively easy. Revenue from excises (including on fuel products) varies from an average of 1 percent of GDP in LIDCs to around 2.5 percent of GDP in AEs. Over time, revenue has often declined in several countries due to a lack of indexation of the specific (i.e., per unit) rates, which causes revenue to fall with inflation. In many countries, there is scope to raise significantly more revenue from excises without adverse distributional effects (Cnossen 2020).

70. Personal income tax (PIT). PIT revenue is much lower in EMDEs compared to AEs, both as a share of GDP and total tax revenue. Yet, in LIDCs this revenue has increased from 1 percent of GDP in 1990 to more than 2 percent of GDP today; and in EMEs, it increased from 1.9 to 3.1 percent of GDP (Benedek, Benítez, and Vellutini 2022). To further expand the base of the PIT, more can be done to reduce informality and non-compliance. On the policy side, countries could rationalize tax expenditures. Several EMEs have scope to enhance the progressivity of the PIT, including by increasing the top PIT rate. The progressivity of the PIT can also be enhanced by more effective taxation of capital income. As discussed earlier, information exchange between countries and digitalization enable a more effective enforcement of these taxes, which can subsequently allow for higher rates on wealth and/or capital income.

71. Real property taxes. Recurrent real property taxes, imposed on gross property values, are among the least distortive for economic growth as their base is immobile. To the extent that property values reflect the value of local public services, property taxes can resemble a benefit tax that supports accountability of local authorities. If capitalized into house prices, they can also be somewhat progressive since home values generally increase with income and net total wealth holdings. Recurrent property taxes in LIDCs raise about 0.25 percent of GDP, compared to 0.6 percent in EMEs and more than 1 percent in AEs. In many countries, there is scope to exploit this tax more fully by raising tax rates, updating property values to current market prices and, especially in developing countries, improving cadasters, and scaling up administrative capacity. Where market-

²⁸ For in-depth discussion of various aspects of VAT policy and administration, see the [IMF/RMTF VAT Webinar Series](#).

based valuation is hard, simplified approaches based on property areas can produce reasonable outcomes at lower administrative costs (Grote and Wen, forthcoming).

72. For countries with natural resources, strengthening their taxation remains crucial. In many countries the regimes applied in the natural resource sector can be strengthened, given that the location-specific rents provide a very efficient base for taxation. Countries with natural resources that are running out or that should not be fully extracted for environmental reasons will need to pivot toward raising more non-resource revenues.

Tax Administration Options

73. A well-functioning revenue administration (RA). To effectively administer and enforce tax laws, governments should put in place management and governance arrangements to ensure (i) independence from political direction (autonomy), (ii) accountability and transparency practices, which help to build public trust, (iii) a rules-based decision-making framework, (iv) high-levels of integrity, (v) agile management models, including a sound organizational design for an effective delivery of strategies, and (vi) a sound result-based management approach. A good revenue administration has a solid foundation of core tax and customs administration functions, such as registration, filing, payment, and correct reporting. Good management and governance are essential, including improved internal assurance mechanisms, effective external oversight, integrity assurance, and improved transparency.

74. Revenue gains from administrative reform. RA reforms can support and reinforce each other and significantly increase overall tax performance. IMF research indicates that revenue can increase by more than 3 percent of GDP after the 6th year following far-reaching and comprehensive reforms of tax administration (Adan and others 2023). Compliance risk management, public accountability, and large taxpayer office improvements are found to play a particularly significant role in increasing revenue in EMEs and LIDCs.²⁹

75. A comprehensive strategy toward compliance. For many RAs, addressing non-compliance is limited to selection of audits, resulting in sub-optimal deployment of the finite resources at the RA's disposal and the treatment of symptoms and not the root causes of non-compliance. To increase compliance and attain a sustainable boost in revenue, RAs should put in place operational processes for: (1) educating taxpayers on their obligations; (2) easing the compliance burden by simplifying processes and reducing the cost of compliance; (3) enforcing revenue laws where needed; and (4) upholding taxpayer rights and entitlements. A comprehensive compliance improvement plan can be designed to target tax evasion by specific risk groups, such as high-wealth individuals, professionals, or self-employed. A special program can also be developed to address VAT non-compliance, which can be informed by an assessment of the VAT compliance gap (see

²⁹ The Tax Administration Diagnostic Assessment Tool (TADAT) can provide an objective assessment of the overall health of key components of a country's system of tax administration, benchmarked against international good practice. TADAT results can help prioritize the reforms needed across the RA's management and operations. See <https://www.tadat.org/home>

above on the IMF's RA-GAP program). A successful strategy requires data-driven revenue administration procedures through improved digitalization and the implementation of effective risk-based compliance management strategies (Brondolo and others 2022; Betts 2022).

76. Strengthening compliance of high-wealth individuals. The tax affairs of high-wealth individuals tend to be complex with an intertwining of private, family, corporate, and investment structures, both international and domestic. It implies that these taxpayers have the opportunity and means to undertake aggressive tax planning and tax evasion. To effectively identify areas of non-compliance, domestic and international exchange of information need to be expanded and the use of information be improved in many countries. Strong leadership, and the development of new skillsets, including data analytics and strengthening auditing, are needed to effectively address non-compliance issues.

77. Advancing the digital transformation of RAs through holistic reform can produce significant revenue gains. Amaglobeli and others (2023) show that digitalization in RA has progressed steadily over the past decade but at an uneven pace. For example, taxpayer online registration was available in 97 percent of AEs, 80 percent of EMEs but only in 50 percent of LIDCs. Similarly, e-filing and e-payment have become ubiquitous in AEs, whereas LIDCs are lagging. A cross-country panel regression analysis suggests that digitalization can pay off. For instance, the adoption of e-invoicing and electronic fiscal devices can improve revenue mobilization by 0.7 percent and 0.5 percent of GDP, respectively (Nose and Mengistu 2023). Microdata-based quasi-experimental studies support the strong response of taxable income to e-filing (Santoro and others 2022). Digitalization can also help mitigate tax arrears and reduce administrative and compliance costs for RAs and taxpayers.

78. Digitalization goes well beyond electronic registration, filing, and payments and includes using data for risk-based compliance. As examples, countries have applied big data analytics to detect evasion, digital mapping tools and satellite imageries analysis to facilitate property taxation, and distributed ledger technologies to support VAT collection (IMF 2018; Collosa 2021). Data sharing and cross-verification of information, including at the international level, can also better support inter-agency cooperation, for example, with a Financial Intelligence Unit. It also provides investigative teams with timely access to essential data that, with the right analytical tools and technologies, including machine learning and artificial intelligence, is invaluable for building cases.

79. Revenue mobilization through customs can also be enhanced, while playing an important role for trade facilitation. Evidence shows that digitalization helps reduce customs fraud at the border (Kitsios and others 2020). Customs administrations, as the institutions responsible for processing all imports and exports and for authorizing entry and exit of goods, play a crucial role in the facilitation, control, and security of international transport, including the food chain. Adopting a strategy for strengthening the efficiency and effectiveness of customs administrations should be an essential part. Key elements of this strategy should include effective freedom of cargo transit in practice, digitalization of documentation and procedures, identification and elimination of unnecessary import and export requirements, adoption of electronic pre-arrival

clearance, use of risk analysis to target verifications and reward compliant businesses, and integration of inspections (i.e., coordinated border management at national level and with neighboring countries).

CONCLUSION

80. Achieving the SDGs will require significant revenue mobilization—both from internationally coordinated taxes and domestic taxes.

While eradicating extreme poverty and hunger would cost modestly on a global scale, achieving other key other SDGs involve significant global financing needs of 3.8 percent of global GDP annually (Table 3). At the country level, costs can be much higher, averaging 16.1 percent of GDP in LIDCs and 4.8 percent of GDP in EMEs. Fully achieving all SDGs would be more costly still.

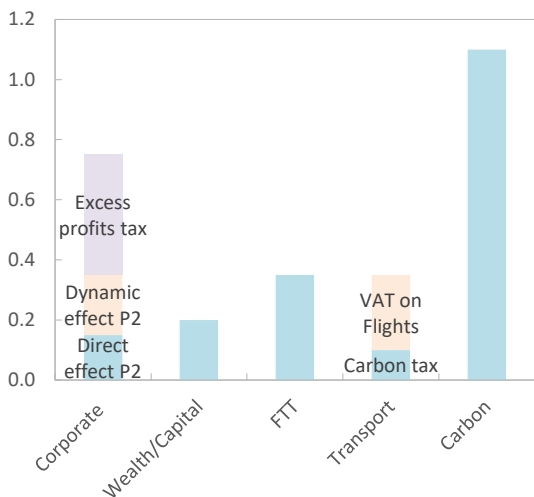
Revenue Needs	% of global GDP
SDG1—Extreme Poverty	0.08
SDG2—Hunger	0.03
SDG 3, 4, and selected targets in 6, 7, 9: health education, key infrastructure (incl. climate risks)	3.8

81. International cooperation on taxation can play an important role in raising revenue but will be insufficient to address SDG spending needs (Figure1313a). Ongoing international tax cooperation (such as the global minimum tax and automatic exchange of information) make a positive but modest revenue contribution compared to what is needed for the SDGs. Moreover, most of the revenue would arise in countries other than those where the needs are greatest, and hence would require a transfer mechanism or an increase in development aid. Significant revenue potential lies in carbon taxation—with the added benefit that it helps address climate change. A possible concern for achieving the SDGs is that only a small portion of the revenue accrues to developing countries. Revenue sharing arrangements, for instance under a global carbon tax, could help address this.

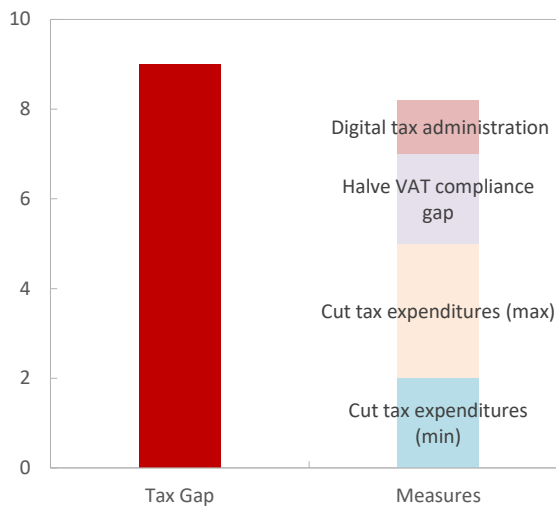
82. Boosting domestic revenue mobilization is challenging but feasible. Many EMDEs have significant tax gaps, meaning that they could raise more, even given their country-specific conditions. Clearly, measures need to be determined based on country circumstances, but in many cases broadening tax bases (by reforming tax expenditures), improving compliance (notably in the VAT) and digitalization could go a long way (Figure1313b). Managing these reforms requires concerted action and may benefit from developing a medium-term revenue strategy. Domestic revenue mobilization is strongly supported by the IMF’s capacity development on tax policy and revenue administration.

Figure13. Potential Revenue Yields

a. International Tax Cooperation
(% of global GDP)



b. Domestic Options and Tax Gap in EMDEs
(% of country GDP)



Source: IMF staff estimates and papers cited in text.

Appendix I. Medium-Term Revenue Strategy

A. What is an MTRS?

An MTRS is a comprehensive, whole-of-government approach to undertaking effective tax systems reform to boost tax revenues and improve the country's tax system over the medium-term to ensure the implementation of a country's development agenda and to attain the SDGs. Although it is led by the government, it should involve all stakeholders to generate buy-in and ensure sustainability even when the government changes. It typically spans four to six years and serves as a high-level roadmap for tax systems reform.

The core elements of an MTRS are (PCT 2017):

- a social contract on the level of revenue mobilization effort for the medium-term (four to six years) with due consideration to the poverty and distributional implications of the adopted measures;
- a comprehensive reform plan for the tax system, reflecting country circumstances and the state of institutional capacity:
 - a redesign of the tax policy setting to meet the revenue goal;
 - a reform of the revenue agencies to properly administer the policy setting and to achieve a high level of taxpayers' compliance to meet the revenue goal;
 - a strengthening of the legal framework to enable the policy redesign to an administration reform, including by balancing revenue agencies powers and taxpayers' rights;
- a country's commitment to a steady and sustained implementation, notably by securing political support and adequate resourcing;
- secured financing for the capacity development effort necessary to support the country in overcoming domestic constraints to implementing the MTRS effectively.

B. Country Engagements to Date

IMF member countries that have adopted an MTRS framework are listed in Table 3, including the approximate stages they are at presently.

Table 1. IMF Member Countries Adopting an MTRS

Formulation Support	Early Implementation	Implementation Support
Albania Bangladesh Ethiopia Maldives Tanzania Togo Tajikistan Vietnam	Benin Ghana Kenya Sierra Leone	Egypt Liberia Papua New Guinea Pakistan Rwanda Senegal Uganda

C. Key Lessons

The MTRS approach is gaining momentum among developing countries and has a lot of support from development partners. There are, however, a few areas that need some attention, which are derived from experiences of the implementing countries. These include: (1) the need for the country to have a long-term vision clearly articulating their development aspirations, which would be broken down into medium-term plans of between four to six years. This would facilitate accurate forecasting of expenditure requirements; (2) the existence of a comprehensive statement of fiscal policy objectives and targets consistent with macroeconomic stability and fiscal sustainability (including in a medium term fiscal framework); (3) a medium-term expenditure framework that provides a comprehensive costing of the government's medium-term plan; (4) strong political support by way of committing the required resources to implementing the MTRS measures; (5) adoption of a best practice and structured reform methodology, which is embedded into the national planning framework; (6) the need to strengthen the MTRS governance framework, preferably leveraging on already existing fora, such as Public Finance Reform Committees or Planning and Budget Committees; and (7) an adjustment of the countries institutional capacity arrangements to provide for the coordination of MTRS development and implementation to avoid over burdening the tax policy teams who tend to be the ones to assume this role in most countries.

References

- Abdel-Kader, Khaled and Ruud de Mooij. 2020. "Tax Policy and Inclusive Growth." IMF Working Paper 2020/271. International Monetary Fund, Washington, DC
- Adan, Hassan, Jean-Marc Atsebi, Nikolay Gueorguiev, Jiro Honda, Manabu Nose. 2023. "Quantifying the Revenue Yields from Tax Administration Reforms." IMF Working Paper 23/231. International Monetary Fund, Washington, DC.
- Aggarwal, Rimjhim, Piergiorgio Carapella, Tewodaj Mogues, and Julieth Pico-Mejia. 2024. "Accounting for Climate Risks in Costing the Sustainable Development Goals." IMF Working Paper 24/49. International Monetary Fund, Washington, DC.
- Alstadsæter, Annette, Niels Johannesen, and Gabriel Zucman. 2018. "Who Owns the Wealth in Tax Havens? Macro Evidence and Implications for Global Inequality." *Journal of Public Economics* 162(C): 89–100.
- Amaglobeli, David, Ruud de Mooij, Andualem Mengistu, Mariano Moszoro, Manabu Nose, Soheib Nunhuck, Sailendra Pattanayak, Lorena Rivero del Paso, Frankosiligi Solomon, Rebecca Sparkman, Herve Tourpe, and Gerardo Uña. 2023. "Transforming Public Finance through GovTech." IMF Staff Discussion Note 23/4.
- Andersen, Maria, Benjamin R. Kett, and Erik von Uexkull. 2017. "Corporate Tax Incentives and FDI in Developing Countries." Global Investment Competitiveness Report 2017/18: Foreign Investor Perspectives and Policy Implications. October 2017: 73–99.
- Aslam, Aqib and Maria Coelho. 2021. "A Firm Lower Bound: Characteristics and Impact of Corporate Minimum Taxation." IMF Working Paper 21/161. International Monetary Fund, Washington, DC.
- Baca-Campodónico, Jorge, Luiz de Mello, and Andrei Kirilenko. 2006. "The Rates and Revenue of Bank Transaction Taxes." OECD Economics Department Working Papers 494, OECD Publishing, Paris, France.
- Beer, Sebastian, Dora Benedek, Brian Erard, and Jan Loeprick. 2022. "How to Evaluate Tax Expenditures," IMF How-To-Note 2022/4. International Monetary Fund, Washington, DC.
- Benedek, Dora, Juan Carlos Benítez, and Charles Vellutini. 2022. "Progress of the Personal Income Tax in Emerging and Developing Countries." IMF Working Paper 22/20. International Monetary Fund, Washington, DC.

- Benitez, Juan Carlos, Mario Mansour, Miguel Pecho, and Charles Vellutini. 2023. "Building Tax Capacity in Developing Countries." Staff Discussion Note 23/6. International Monetary Fund, Washington, DC.
- Betts, Susan. 2022. "Compliance Risk Management Framework to Drive Revenue Performance." IMF Technical Notes and Manuals 2022/5. International Monetary Fund, Washington, DC.
- Black, Simon, Antung A. Liu, Ian Parry, and Nate Vernon. 2023. "IMF Fossil Fuel Subsidies Data: 2023 Update." International Monetary Fund, Washington, DC.
- Black, Simon, Ruud de Mooij, Vitor Gaspar, Ian Parry, and Karlygash Zhunussova. 2024. "Fiscal Implications of Global Decarbonization." IMF Working Paper 24/45, International Monetary Fund, Washington, DC.
- Black, Simon, Ian Parry, and Karlygash Zhunussova. 2023. "Is the Paris Agreement Working? A Stocktake of Global Climate Mitigation." IMF Staff Climate Note 23/2, International Monetary Fund, Washington, DC.
- Brondolo, John, Annette Chooi, Trevor Schloss, and Anthony Siouclis. 2022. "Compliance Risk Management: Developing Compliance Improvement Plans." IMF Technical Notes and Manuals 22/1. International Monetary Fund, Washington, DC.
- Carapella, Piergiorgio, Tewodaj Mogues, Julieth Pico-Mejía, and Mauricio Soto. 2023. "How to Assess the Spending Needs of the Sustainable Development Goals: The 3rd Edition of the IMF SDG Costing Tool." IMF How-To-Note 23/5. International Monetary Fund, Washington, DC.
- Carl, Jeremy, and David Fedor. 2016. "Tracking Global Carbon Revenues: A Survey of Carbon Taxes versus Cap-and-Trade in the Real World." *Energy Policy* 96: 50–77.
- Clausing, Kimberly A. 2020. "Profit Shifting Before and After The Tax Cuts And Jobs Act." *National Tax Journal* 73(4): 1233–1266.
- Cnossen, Sijbren. 2020. "Excise Taxation for Domestic Resource Mobilization." CESifo Working Paper No 8442.
- Collosa, Alfredo. 2021. "Use of Big Data in Tax Administrations." CIAT.
- Crivelli, Ernesto, Ruud de Mooij, Erik de Vrijer, Shafik Hebous, and Alexander Klemm. 2021. "Taxing Multinationals in Europe," IMF Departmental Paper 21/12. International Monetary Fund, Washington, DC.
- Crivelli, Ernesto, Ruud De Mooij, and Michael Keen. 2013. "Base Erosion, Profit Shifting and Developing Countries." *FinanzArchiv / Public Finance Analysis* 72(3): 268–301.

- Dama, Alou Adesse, Grégoire Rota-Graziosi, and Faycal Sawadogo. 2024. "The Regressivity of CIT Exemptions in Africa." *International Tax and Public Finance* <https://doi.org/10.1007/s10797-023-09825-6>.
- De Mooij, Ruud, Ricardo Fenochietto, Shafik Hebous, Sébastien Leduc, and Carolina Osorio-Buitron. 2020. "Tax Policy for Inclusive Growth After the Pandemic." IMF Note Special Series on COVID-19. International Monetary Fund, Washington, DC.
- De Mooij, Ruud, Alexander Klemm, and Victoria Perry. 2021. *Corporate Income Taxes under Pressure: Why Reform Is Needed and How It Could Be Designed*. International Monetary Fund, Washington, DC.
- Dharmapala, Dhammika. 2014. "What Do We Know About Base Erosion and Profit Shifting? A Review of the Empirical Literature." *Fiscal Studies* 35(4), 421–448.
- Dowd, Tim, Paul Landefeld, and Anne Moore. 2017. "Profit Shifting of U.S. Multinationals." *Journal of Public Economics* 148: 1–13.
- EU Tax Observatory. 2023. "Global Tax Evasion." Report 2024. Paris, France.
- European Commission. 2011. "Impact Assessment Accompanying the document Proposal for a Council Directive on a common system of financial transaction tax and amending Directive 2008/7/EC." Commission Staff Working Paper, SEC (2011) 1102 final, Annex 11.
- FAO, IFAD, UNICEF, WFP, and WHO. 2019. "The State of Food Security and Nutrition in the World 2019. Safeguarding against Economic Slowdowns and Downturns." FAO, Rome.
- FAO, IFAD, UNICEF, WFP, and WHO. 2023. "The State of Food Security and Nutrition in the World 2023. Urbanization, Agrifood Systems Transformation and Healthy Diets across the Rural–Urban Continuum." FAO, Rome.
- Fuest, Clemens, Shafik Hebous, and Nadine Riedel. 2001. "International Debt Shifting and Multinational Firms in Developing Economies." *Economics Letters* 113(2): 135–138.
- Vitor Gaspar, Laura Jaramillo, and Philippe Wingender. 2016. "Tax Capacity and Growth: Is there a Tipping Point?," IMF Working Papers 16/234. International Monetary Fund, Washington, DC.
- 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 Note 19/3. International Monetary Fund, Washington, DC.
- Gates, Scott, Håvard Hegre, Håvard Nygård, and Håvard Strand. 2012. "Development Consequences of Armed Conflict." *World Development*, 40(9): 1713–1722.

- Grote, Martin and Jean-Francois Wen. forthcoming. "How to Design and Implement Property Tax Reforms." How-To-Note. International Monetary Fund, Washington, DC.
- Heady, Christopher, and Mario Mansour. 2019. "Tax Expenditure Reporting and Its Use in Fiscal Management: A Guide for Developing Economies." IMF How-To-Note 19/1. International Monetary Fund, Washington, DC.
- Hebous, Shafik, Alexander Klemm, Geerten Michielse, and Carolina Osorio-Buitron. 2024. "How to Tax Wealth." IMF How-to-Note 2024/1. International Monetary Fund, Washington, DC.
- Hebous, Shafik, Dinar Prihardini, and Nate Vernon. 2022. "Excess Profit Taxes: Historical Perspective and Contemporary Relevance." IMF Working Paper No. 2022/187. International Monetary Fund, Washington, DC.
- Hugger, Felix, Ana Cinta González Cabral, Massimo Bucci, Maria Gesualdo, and Pierce O'Reilly. 2024. "The Global Minimum Tax and the Taxation of MNE Profit." OECD Taxation Working Paper 68, OECD Publishing, Paris.
- IATA. 2023. "Global Outlook for Air Transport—A local sweet spot." International Air Transport Association, Montreal, Quebec, Canada.
- IMF. 2018. "Capitalizing on Good Times." Fiscal Monitor, April 2018. International Monetary Fund, Washington, DC.
- IMF. 2019a. "Corporate Taxation in the Global Economy." Policy Paper No. 2019/007. International Monetary Fund, Washington, DC.
- IMF. 2019b. "Macroeconomic Developments and Prospects in Low-Income Developing Countries." Policy Paper, International Monetary Fund, Washington DC.
- IMF. 2022. "Coordinating Taxation Across Borders." Fiscal Policy from Pandemic to War, Chapter 2: Fiscal Monitor April 2022. International Monetary Fund, Washington, DC.
- IMF. 2023. "International Corporate Tax Reform." IMF Policy Paper No. 23/1. International Monetary Fund, Washington, DC.
- IMF. 2024. "Macroeconomic Developments and Prospects for Low-Income Countries—2024." IMF Policy Paper 24/11. International Monetary Fund, Washington DC.
- IMF, OECD, UN, and World Bank. 2015. "Options for Low Income Countries' Effective and Efficient Use of Tax Incentives for Investment." Report to the G20 Development Working Group.
- IMF, OECD, UN, and WBG. 2020. "The Taxation of Offshore Indirect Transfers—A Toolkit." Platform for Collaboration on Tax.

- IOPC. 2024. "Explanatory Note." International Oil Pollution Compensation Funds, London, United Kingdom.
- ITF. 2019. "Maritime Subsidies: Do They Provide Value for Money?", International Transport Forum Policy Papers, No. 70, OECD Publishing, Paris.
- Jakobsen, Katrine, Kristian Jakobsen, Henrik Kleven, and Gabriel Zucman. 2020. "Wealth Taxation and Wealth Accumulation: Theory and Evidence From Denmark." *Quarterly Journal of Economics* 135(1): 329–88.
- Keen, Michael, Ian Parry, and James Roaf. 2021. "Border Carbon Adjustments: Rationale, Design and Impact." IMF Working Paper 21/239. International Monetary Fund, Washington, D.C.
- Keen, Michael, Ian Parry, Jon Strand, Chiara Fumagalli, and Elisabetta Iossa. 2013. "Planes, Ships and Taxes: Charging for International Aviation and Maritime Emissions." *Economic Policy* 28(76): 701–49.
- Kronfol, Hania and Victor Steenbergen. 2020. "Evaluating the Costs and Benefits of Corporate Tax Incentives." World Bank Publications - Reports 33433, The World Bank Group.
- Laborde, David, Sophia Murphy, Marie Parent, Jaron Porciello, and Carin Smaller. 2020. "Ceres2030: Sustainable Solutions to End Hunger." Cornell University, IFPRI, and IISD.
- Laborde, David, Marie Parent, and Carin Smaller. 2020. "Ending Hunger, Increasing Incomes, and Protecting the Climate: What would it Cost?" Ceres2030. International Food Policy Research Institute (IFPRI), and International Institute for Sustainable Development (IISD).
- Langenmayr, Dominika, and Lennard Zyska. 2023. "Escaping the Exchange of Information: Tax Evasion via Citizenship-by-Investment." *Journal of Public Economics* 221: 104865.
- Londoño-Vélez, Juliana, and Javier Ávila-Mahecha. forthcoming. "Behavioral Response to Wealth Taxation: Evidence from Colombia." *Review of Economic Studies*.
- Mansour, Mario, Patrick Petit, and Fayçal Sawadogo. 2023. "How to Design Excise Taxes on Alcoholic Beverages?" IMF How-to Note 23/4. International Monetary Fund, Washington, DC.
- Matheson, Thornton. 2012. "Security Transaction Taxes: Issues and Evidence." *International Tax and Public Finance* 19: 884–912.
- Menkhoff, Lukas, and Jakob Miethe. 2019. "Tax Evasion in New Disguise? Examining Tax Havens' International Bank Deposits." *Journal of Public Economics* 176: 53–78.
- Nose, Manabu and Anduaem Mengistu. 2023. "Exploring the Adoption of Selected Digital Technologies in Tax Administration: A Cross-Country Perspective." IMF Note 2023/008

- OECD. 2018. "The Role and Design of NetWealth Taxes in the OECD." OECD Tax Policy Studies 26, Paris: OECD Publishing.
- Parry, Ian, Simon Black, and James Roaf. 2021. "A Proposal for an International Carbon Price Floor." IMF Staff Climate Note. International Monetary Fund, Washington, DC.
- Parry, Ian, Dirk Heine, Kelley Kizzier, and Tristan Smith. 2022. "A Carbon Levy for International Maritime Fuels." *Review of Environmental Economics and Policy* 16: 25–41.
- Pekanov, Atanas, and Margit Schratzenstaller. 2019. "A Global Transaction Tax: Theory, Practice and Potential Revenues." WIFO working paper 582/2019.
- Petit, Patrick, Mario Mansour, and Philippe Wingender. 2021. "How to Apply Excise Taxes to Fight Obesity." IMF How-to Note 21/8. International Monetary Fund, Washington, DC.
- Petit, Patrick, and Janos Nagy. 2016. "How to Design and Enforce Tobacco Excises?" IMF How-to Note 16/3. International Monetary Fund, Washington, DC.
- PCT, 2017. "Concept Note on the Medium-Term Revenue Strategy (MTRS)," Platform for Collaboration in Tax, Washington, DC.
- Solt, Frederick. 2023. "Measuring Income Inequality Across Countries and Over Time: The Standardized World Income Inequality Database. SWIID Version 9.6." *Social Science Quarterly*.
- Sarin, Natasha, and Lawrence Summers. 2019. "Shrinking the Tax Gap: Approaches and Revenue Potential," NBER Working Paper No. 26475.
- Saez, Emmanuel, and Gabriel Zucman. 2019. "Progressive Wealth Taxation." *Brookings Papers on Economic Activity* Fall 2019: 437–511.
- Santoro, Fabrizio, Oyebola Okunogbe. 2022. "Increasing Tax Collection in African Countries- The Role of Information Technology." WBG Policy Research Working Paper 10182.
- Sen, Amartya. 1999. *Development as Freedom*. New York: Alfred Knopf.
- Tørsløv, Thomas, Ludvig Wier, and Gabriel Zucman. 2023. "The Missing Profits of Nations," *Review of Economic Studies* 90(3): 1499–1534.
- Umlauf, Steven. 1993. "Transaction Taxes and the Behavior of the Swedish Stock Market." *Journal of Financial Economics* 33: 227–240.
- UNCTAD. 2023. "Towards a Green and Just Transition." Review of Maritime Transport. United Nations Conference on Trade and Development, Geneva, Switzerland.
- UNEP. 2023. "Emissions Gap Report 2023: Broken Record—Temperatures Hit New Highs, Yet World Fails to Cut Emissions (Again)." United Nations Environment Programme, Nairobi, Kenya.

- UNFCCC, 2022. "Nationally Determined Contributions under the Paris Agreement: Synthesis Report by the Secretariat." United Nations Framework Convention on Climate Change, Bonn, Germany.
- Warwick, Ross, Tom Harris, David Phillips, Maya Goldman, Jon Jellema, Gabriela Inchauste, and Karolina Goraus-Tańska. 2022. "The Redistributive Power of Cash Transfers vs VAT Exemptions: A Multi-Country Study." *World Development* 151: 105742.
- WBG, 2023. Carbon Pricing Dashboard. World Bank Group, Washington, DC.
<https://carbonpricingdashboard.worldbank.org>.
- Yonzan, Nishant, Daniel Gerszon, and Christoph Lakner. 2023. "Poverty is Back to pre-COVID Levels Globally, but not for Low-Income Countries." World Bank Blogs series, October 2023.
- ZEF and FAO. 2020. "Investment Costs and Policy Action Opportunities for Reaching a World without Hunger (SDG2)." Center for Development Research and Food and Agriculture Organization, Rome and Bonn.
- Zucman, Gabriel. 2013. "The Missing Wealth of Nations: Are Europe and U.S. Net Debtors or Net Creditors?" *Quarterly Journal of Economics* 128 (3): 1321–64.