Evaluation of **tax** expenditures

Conceptual frameworks and international experiences

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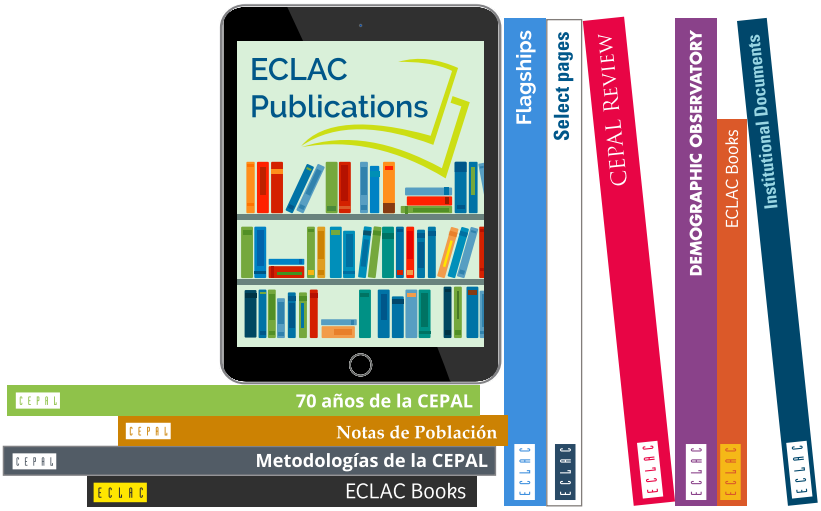

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Contents

Introduction

Rationalising the use of tax expenditures (TEs) can lead to a double dividend of mobilising additional domestic resources and increasing fiscal space while at the same time achieving a better alignment of TEs with national public policy objectives and development strategies. However, reforming TE policies can be a challenging process that requires a sound institutional and legal framework, data to estimate costs and benefits as well as a comprehensive evaluation framework.

As shown by the Global Tax Expenditures Database (GTED),[1] the number of countries reporting on TEs has steadily grown over the years, from 6 in 1990 to 88 in 2020 (Redonda, von Haldenwang & Aliu, 2023). Still, the scope and quality of these reports vary significantly across countries, ranging from comprehensive reports providing detailed information and estimates of revenue forgone on the TEs in use, to documents that only contain a few aggregate figures, e.g., by type of tax.

Even at the level of individual provisions, revenue forgone estimates alone do not convey the full picture, as long as these figures are not related to the impact of the respective TEs. To distinguish provisions that fulfil their objectives from ones that should be reformulated or abolished, TEs need to be evaluated regarding their effectiveness and efficiency in reaching their stated policy goals.

Ideally, such evaluations would be based on a regulatory framework that requires all TEs to be assessed on a regular basis, both ex-ante and ex-post. This framework would establish responsibilities and procedures to be followed when setting up a new TE provision. Ex-ante assessments can be based on a broad range of methods that includes modelling and forecasts of forgone revenues as well as the use of basic questionnaires. They should allow policymakers to assess the economic rationale behind a specific TE provision as well as the overall policy coherence of TE use and their embeddedness in development and medium-term fiscal strategies. In contrast, ex-post evaluations should establish whether a specific TE (or group of TEs) has achieved its stated objectives and whether it was the most efficient mechanism to fulfil that purpose. Evaluations should also identify major spillover effects or externalities (both positive and negative) that a TE triggers and assess these effects against criteria of sustainability and public policy coherence. Such evaluations should be carried out by ministries of finance, other public agencies, legislative bodies, or by independent external evaluators. Their results should be used to inform the political

[1] Available online at https://gted.net.

debate on the budget, fiscal policy in general and the use of TEs. Equally important, evaluations should be publicly accessible, just like the TE reports themselves, to increase transparency and accountability.

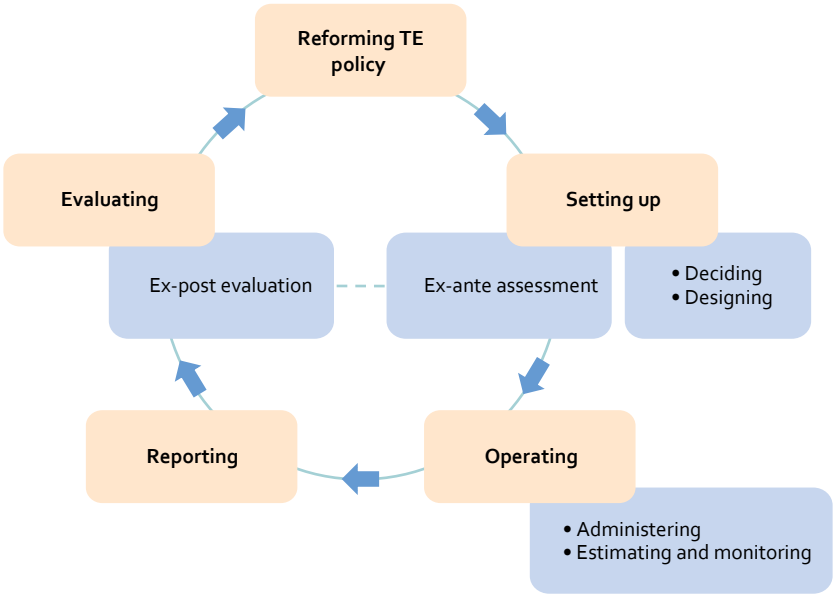
Despite the key role sound evaluation frameworks should play in rationalising TE systems, the current state of TE evaluations is far from the ideal situation described above. Indeed, most countries do not carry out TE evaluations. Only a minority of countries, such as Canada or the Republic of Korea, have ex-ante and ex-post evaluation frameworks in place. It is generally the same small group of countries that refer to evaluations of individual provisions in their TE reports and provide information on how to access those evaluations (for instance, by providing hyperlinks to the websites hosting them). However, there is not a single case where all reported TEs have been effectively evaluated at least once.

Against this backdrop, this report introduces the main characteristics of evaluations frameworks and puts them in perspective with regard to the TE policy cycle. It also provides an international overview of the state of TE evaluations, focusing on different experiences regarding the regularity, scope, and methodological choices of existing evaluations. The report is structured as follows: Section 1 introduces the TE policy cycle. Section 2 discusses evaluation frameworks (both ex-ante and ex-post) as well as the methods that have been used to evaluate TE policies. Section 3 provides an international overview of the state of TE evaluations. Section 4 builds on Section 3 with concrete country-cases and discusses the main findings of each. Finally, Section 5 puts the TE evaluation discussion in the context of the policy cycle and explains why evaluations are necessary for the design and effectiveness of public policies.

I. Conceptual framework for tax expenditure policymaking

To assess public policies and the role evaluations play in this context, a common approach has been to visualise the public policy process as a policy cycle that involves a sequence of stages or phases (for instance, see Jann & Wegrich, 2007). This heuristic approach has proven to be helpful in understanding how political decision-making, administrative implementation and learning are interrelated. As illustrated in diagram 1, the policymaking process in the TE field can be assessed in terms of a cycle that combines five different stages.

Diagram 1
The tax expenditure policy cycle



Source: Authors' elaboration.

When **setting up TEs**, decisions on public policy objectives and the use of TEs to pursue such objectives are being taken. The governance as well as institutional and legal frameworks are key. It is crucial to state the legal basis upon which TEs are granted, referring either to individual laws (on taxes, fiscal responsibility, export promotion, sector development, regional development, etc.) or executive decrees (on new TEs, modification or extension of existing TEs). Since a sound legislative and regulatory framework surrounding the use of TEs is vital, they should be incorporated in the relevant tax laws.

Ideally, the legal justification for TEs should always convey information on the possible responsibilities of different government bodies and other actors in the establishment and management of TEs. It is important that the responsibilities for the design, estimation, monitoring, and reporting of TEs are well defined and aligned with the ministry that is responsible for overall fiscal policy to avoid fragmentation. If different public entities have the lead at different stages of the TE policy cycle, the likelihood of disturbances in the policy making process (and therefore the need for coordination) are higher. Likewise, the role of the legislature is critical in the approval of new TEs as well as the modification and elimination of existing TE provisions. The introduction or modification of TEs without prior involvement of the legislature should be limited to exceptional circumstances as defined by law. For the sake of policy coherence, TEs should be linked to the budget and the government's medium-term fiscal or revenue plan. For instance, TE reports should be included in the budget proposal and presented in a way that facilitates comparison with other budget expenditures, e.g., using the government's classification of functions applied to direct spending programs (ECLAC/Oxfam International, 2019).

In addition, disclosing the group of and, whenever possible, the number of beneficiaries of TEs should be a priority for governments. Indeed, as discussed by OECD (2015), in some cases (e.g., when a few investors or sectors benefit from various TEs, and if this does not go against the requirement of laws and regulations governing taxpayer confidentiality), governments should consider disclosing the largest beneficiaries of TEs by specific tax provision.

Insights from ex-ante assessments and previous TE evaluations can play an important role in the design of individual TEs. The former refers to the requirement to prepare assessments aiming to inform on the potential effects of a new TE provision prior to its introduction —ideally, before presenting the respective initiative to the parliament. Design features such as the type of TE (e.g., exemptions, deferrals, tax credits), eligibility criteria, threshold values, reporting requirements for beneficiaries, and the duration of the measure can have a significant impact on the effectiveness of the TE as well as on its fiscal, administrative and compliance costs, and even on the (ex-post) evaluation strategy. Ex-ante assessments are discussed in more detail in the following section of the report.

Operating TEs deals with the everyday management of TEs and covers the administration as well as estimation and monitoring of TEs. TEs can significantly differ regarding their administrative burden, compliance costs and monitoring requirements.

Administering TEs typically requires cooperation among and coordination between government agencies. Whereas TE policy decisions are usually made or prepared by the Ministry of Finance (ideally, the tax policy unit (TPU) or similar), tax administrations play an important role in the administration of TEs, providing information to taxpayers, receiving and processing TE-related information, detecting and sanctioning abusive behaviour, etc. They are also key data providers for the estimation of revenue forgone as well as for any TE evaluation. Other public entities such as line ministries, investment promotion agencies, and others, can have relevant functions as well. However, if many actors have responsibilities in the administration of TEs, the transaction costs of operating TEs tend to rise, and coordination becomes even more important.

Governments should estimate the fiscal cost or revenue forgone of all TE provisions they use. This task is highly dependent on data availability and hence requires an active role of the tax administrations, either by coordinating with the Ministry of Finance or by directly providing the figures. While such estimations are typically prepared at regular intervals, ideally linked to the budget cycle, a sound

monitoring system of TEs may sometimes require additional efforts. In the case of TEs implemented on short notice or in response to a crisis, for instance, governments may want to monitor the uptake of a measure (including number of beneficiaries and amounts claimed) or identify potential implementation issues as quickly as possible.

Reporting on TEs is another crucial stage in the TE policy cycle. A well-designed TE report provides revenue forgone estimates at the level of individual TE provisions, along with information on the legal basis, policy goals, targeted beneficiaries, and the respective benchmark tax system for every provision. Regular and comprehensive reporting of is key to incorporate TE-related information into policymaking processes.

At the same time, TE reporting can make a substantial contribution to increasing transparency and accountability on the use of public resources. In this context, communication is important to avoid sending the wrong message (e.g. "*tax expenditures are wasteful*") and prevent common misconceptions (e.g. "*all tax expenditures are tax exemptions*") (Granger et al., 2022). For the same reason, regular TE reports should contain information on all TE evaluations conducted during the observation period, including summaries of main findings and information on how to access the full evaluation reports.

If reporting is deficient or altogether inexistent, TEs could present larger risks of opacity and a lower level of scrutiny in the budget process than direct spending measures. According to the latest figures released by the GTED, 112 out of 218 jurisdictions worldwide have never published any official TE report and, equally worrisome, the scope and detail of most of the existing reports leave significant room for improvement. For instance, information about the fiscal cost (revenue forgone) as well as the policy goals of TEs is often not disclosed. Likewise, many countries only report aggregated revenue forgone data —mostly by type of tax— and do not detail the policy objectives and the legal basis for TE provisions.

The picture is brighter in Latin America and the Caribbean, a region with a certain tradition and expertise when it comes to TE reporting: 19 countries[2] in the region provide revenue forgone estimates, and 4 countries from this sample (Argentina, Chile, Mexico, and Peru) provide information on policy objectives. With more than 50 percent, Mexico has the highest share of revenue forgone estimates linked to a stated policy objective, followed by Argentina (slightly above 25 percent) (Redonda, von Haldenwang & Aliu, 2023).

Evaluating TEs requires, at a minimum, running a cost-benefit analysis based on the observed impact of the TE provision. A comprehensive evaluation designs include identifying spillover effects (both positive and negative) arising from the implementation of TEs. Whereas ex-ante assessments and ex-post evaluations are different in spirit, substance and take place at different stages within the TE policy cycle, they are interconnected. It is worth designing a comprehensive evaluation framework that covers both dimensions.

Finally, **Reforming TE policy** is among the more challenging stages of the TE policy cycle, as technical and political factors come into play simultaneously. Rationalising the use of TEs can trigger a double dividend. First, as shown by Equation 1, reducing the use of TEs has an indirect mechanic effect on tax revenue collection, which is relevant for low- and lower-middle-income countries (LICs and LMICs).

$$TR = t * B\left(\underbrace{TE}_{(-)}, \boldsymbol{X}\right) \tag{1}$$

Among other factors (***X***) such as tax avoidance and tax compliance, the tax base (*B*) is an indirect function of TEs (TE). Hence, as shown by Equation 1, everything else (including the marginal tax rate t) equal, reducing *TE* broadens the tax base (*B)* and, ultimately, has a positive impact on tax revenue (*TR*).

[2] The countries from Latin America and the Caribbean listed in the GTED are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, and Uruguay.

During the 1990 to 2020 period covered by the GTED, the average revenue forgone due to TEs for the 14 reporting low-income countries (LICs)[3] in the database stood at 2.8% of GDP and 24.8% of tax revenue in contrast to 2.9% of GDP and 19.7% of tax revenue for the 27 lower middle-income countries (LMICs)[4] in the GTED. In Latin America and the Caribbean, the revenue forgone during this period for the 19 reporting countries in the GTED averaged 4.3% of GDP and 27.5% of tax revenue. These figures do not imply equal revenue gains if the respective TEs are dismantled, since taxpayers may change their behaviour by adapting to the new conditions. However, eliminating TEs that are not accomplishing their objectives can be an option to generate additional revenue in times of fiscal stress.

Second, reforming and justifying TE policies can contribute to a better alignment of tax systems with public policies and development strategies. TEs can be an important tool for fiscal policy to pursue different policy goals such as creating employment, attracting foreign investment, or greening the economy (ECLAC, 2019; ECLAC/Oxfam International, 2019). However, when ill-designed, they can be ineffective and trigger negative side effects or externalities. Hence, evaluating TEs is necessary (though not sufficient) to identify provisions that do not generate the desired impact, or worse, trigger significant negative socioeconomic externalities against those that are more cost-effective.

While it is evident that evaluation is crucial, reforming TE policies requires an understanding of the considerations that lie behind their governance as well as the political economy in the TE area.

[3] LICs listed in the GTED are Burkina Faso, Burundi, Central African Republic, Democratic Republic of the Congo, Ethiopia, Guinea, Liberia, Madagascar, Mali, Niger, Rwanda, Sierra Leone, Togo, and Uganda.

[4] LMICs listed in the GTED are Algeria, Benin, Bhutan, Bolivia (Plurinational State of), Cabo Verde, Cameroon, Côte D'Ivoire, El Salvador, Eswatini, Ghana, Honduras, India, Indonesia, Kenya, Lesotho, Mauritania, Mongolia, Morocco, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Philippines, Senegal, Sri Lanka, Tanzania (United Republic of), and Ukraine.

II. Tax expenditure evaluation

The evaluation of TEs is a key aspect of the TE policy cycle and includes both ex-ante assessments and ex-post evaluations. The two may differ in terms of data requirements, modelling and can be conducted by different agencies or units. However, both share important features and synergies, which makes it advisable to treat them in a joint TE evaluation framework. Most importantly, ex-ante assessments can be used to produce the baseline data against which the costs and benefits of TEs can later be evaluated. When ex-post evaluation requirements are not taken into consideration in the ex-ante assessment framework, the ex-post evaluation stage can become more challenging.

For instance, under the 2017 Tax Cuts and Jobs Act, the US Congress approved the creation of the Opportunity Zones (OZs), e.g., a TE provision allowing taxpayers to pay reduced taxes under some circumstances or defer taxes on profits derived from investments in distressed communities. In 2020, the Government Accountability Office (GAO) released a study regarding the need to supervise and evaluate the performance of the OZs. When the OZ was designed, the Congress did not designate a custodian with the responsibility and authority to collect data, evaluate, and report on the provision's performance. This ultimately led to insufficient data availability for evaluating the performance of the OZ (GAO, 2020).

Ideally, a TE evaluation should be based on a theory of change that establishes the causal links between the TE and its outcomes and should include a broad view on the interlinkages of TEs with other public policy measures. Typically, country-level or international TE evaluation frameworks develop a set of evaluation criteria that may include the following aspects:[5]

(i) *Relevance and rationale*: A clear and detailed description of the stated policy goal and the rationale to introduce the TE should be provided. What is the policy issue that the TE seeks to address? Is the TE justified from an economic and social perspective?

(ii) *Fiscal cost*: What is the estimated revenue forgone of the TE? If computing a precise estimate is not feasible, a range (e.g., based on different scenarios) could be helpful. Describing the uncertainties (e.g., relevant behavioural elasticities that are difficult or impossible to estimate ex-ante) can also be helpful.

[5] For instance, see GAO (2012) (on the US); Myles et al. (2014) (on the UK); Thöne and Gerhards (2019) (on Germany) as well as overarching frameworks developed, e.g. by Beer et al. (2022); Granger et al. (2021) and Kronfol and Steenbergen (2020).

(iii) *Efficiency*: A key aspect to consider is the use of TEs as opposed to other public policy instruments. For instance, does the evaluation assess TEs against alternative direct spending or regulatory options? Are administrative and compliance costs generated by the TE properly considered?

(iv) *Impact and evidence:* What are the expected or observed changes triggered by the TE? Overview of available relevant evidence allowing to shed light on its potential effectiveness (or lack thereof). When available, reviewing previous evaluations of similar TE provisions in similar contexts (economic sectors, comparable countries) shall be particularly relevant. A detailed description of the affected groups, e.g., economic sectors, types of firms (for instance, start-ups or small and medium enterprises), income deciles, etc. should also be provided.

(v) *Side effects or externalities:* What are the potential or observed side effects or externalities triggered by the TE? For example:

- Knowledge or economic spillovers: Are there any knowledge or economic (such as employment creation) spillovers triggered in other sectors or regions?
- Sustainability: What are the expected or observed impacts of the TE on environmental, economic and social sustainability?
- Distributional impact: Which taxpayers are capturing the largest share of the benefit, e.g., individual taxpayers across the income distribution, or different types of firms?

(vi) *Monitoring and evaluation (M&E)*: Is the assessment or evaluation embedded in an M&E framework?

- Governance: Which institution oversees the evaluation? The Ministry of Finance, or the national auditing authority? What is the role of other institutions such as the legislature, the tax authority, or other line ministries?
- Timeline: When will the TE be evaluated and how will the results be fed back in the policy making process (e.g., deadlines to share evaluation results with the legislature)?
- Methods and data availability: Which methods are used for the evaluation? Is the required data available? Are the necessary data sharing protocols already in place?

(vii) *Policy coherence:* Another highly relevant aspect concerns the overall policy coherence of TE use and their alignment with the budget, as well as their embeddedness in development and medium-term fiscal strategies and international commitments of the country.

A. Ex-ante assessment framework

In general, governments are required to justify those measures that have an impact on public expenditure as part of the budget process (Granger et al., 2021). These requirements are part of the public financial management (PFM) system and include an ex-ante assessment of the fiscal costs associated with those measures. Likewise, governments may be legally required to prepare ex-ante assessments of TEs before their introduction or, ideally, before presenting the respective initiative to the parliament. In those cases, an institutional framework establishes responsibilities and procedures to be followed when setting up a new TE provision. Often, the TPU of the ministry of finance is charged with this responsibility, but the task can also be delegated to specific commissions involving several ministries as well as the tax administrations, or even to an external evaluator.

Other aspects to be considered include, for instance, the incorporation of sunset clauses,[6] the establishment of general budget limits for individual TEs or for total revenue forgone, and the potential modifications of the TE under review to improve its effectiveness and efficiency. For instance, the Republic of Korea sets a discretionary TE-to-Tax Revenue target and the Kingdom of the Netherlands has recently added an ad-hoc question asking if a sunset clause applies (see box 1).

In some cases, ex-ante assessments are based on microsimulation or other economic models to estimate the potential effects of new TEs. For instance, a recent ex-ante evaluation published by the Federal Planning Bureau of Belgium used the Belgian Car Stock Model (CASMO) to assess the impact of two measures (the elimination of corporate tax deductibility for all company cars except those with zero CO_2 emissions, and the reduction of the deductibility for electric company cars) on fleet composition and tax as well as parafiscal revenues up to 2040 (Franckx, 2022). The analysis suggested that the two measures would likely accelerate the electrification of the company car fleet and result in a decline in CO_2 emissions, peaking at about 1 million tons of CO_2 annually in the first half of the 2030s. Moreover, compared to the no-reform scenario, the reform potentially would lead to an increase in net tax revenues of about 1 billion euros, equivalent to around 1.1 billion dollars or 0.2% of 2021 GDP, on an annual basis.

However, in most cases, ex-ante assessments are designed as a qualitative/descriptive analysis tool aiming to find out whether the implementation of a new TE provision would make sense in terms of its relevance and potential cost-effectiveness (see box 1).

Box 1
Comparison of ex-ante TE assessment frameworks of Ireland and the Kingdom of the Netherlands

Ex-ante assessments take place before the introduction of a new TE provision. In general, the assessment seeks to address issues related to the rationale for its implementation, potential impact, and relative performance with respect to other alternatives.

They are usually designed as descriptive assessments and based on a set of guiding questions discussing the objective, efficiency, suitability, and feasibility of the provision being assessed.

This is the case, for instance, in Ireland and the Kingdom of the Netherlands. Both countries have a framework for ex-ante assessments of TEs which are, up to a large extent, based on a similar set of questions:

Comparison of ex-ante TE assessment frameworks of Ireland and the Kingdom of the Netherlands

Ireland	Kingdom of the Netherlands
What objective does the tax expenditure aim to achieve?	Is the problem clear?
What market failure is being addressed?	Is the objective stated clearly and unambiguously?
Is a tax expenditure the best approach to address the market failure?	Can it be proven why financial intervention is necessary?
What economic impact is the tax expenditure likely to have?	Can it be proven why a subsidy is preferred over a levy?
How much is it expected to cost?	Can it be proven why a tax incentive is preferred over a direct subsidy?
	Is the evaluation of the provision sufficiently established?
	Is a sunset clause applicable?

Source: Authors' elaboration based on Department of Finance of Ireland (2014) and Ministerie van Financiën (2022).

[6] A sunset clause within the realm of tax expenditures refers to a stipulated provision that institutes an expiration date for distinct tax measures, including but not limited to, deductions or credits. This clause serves a dual purpose: firstly, it necessitates policymakers to conduct regular evaluations and secondly, assesses the efficiency of these fiscal provisions before establishing whether to extend, amend, or allow them to lapse.

In both countries, ex-ante assessments aim to identify the problem at hand and describe which objectives the TE seeks to achieve. A clear definition of the policy goals is key in both cases. In the Irish TE report, the importance of defining a policy objective in line with the overall government's policy goals is explicitly mentioned (Department of Finance of Ireland, 2014). An ex-ante assessment framework provides the opportunity to define and examine the policy objective of a TE and whether it is aligned with other policies. Moreover, a clearly stated objective is necessary in the context of a potential ex-post evaluation of the TE provision.

In the Kingdom of the Netherlands, a greater focus lies on justifying the use of a specific TE, and whether it is the most suitable policy tool in terms of cost and efficiency.

Whereas the Kingdom of the Netherlands framework indirectly discusses the cost (in questions 4 and 5), Ireland includes an ad-hoc question where the expected fiscal cost needs to be assessed.

Both frameworks incorporate the ex-post evaluation dimension. The Dutch framework has a specific question on this. Likewise, the TE report even touches on the methods and data that will be needed for ex-post evaluations in the second-last question on impact.

Finally, as discussed in the latest TE report for the Kingdom of the Netherlands, the framework pushes for policy makers to discuss whether a sunset clause is applicable or not (Tweede Kamer der Staten-Generaal, 2022), which has resulted in question seven recently being added.

Source: Authors' elaboration, on the basis of Tweede Kamer der Staten-Generaal, *Nota over de toestand van 's rijks financiën, Vergaderjaar 2022–2023, 2022*, and Department of Finance of Ireland, 2014.

Methodological approaches differ with the tax upon which a TE is applied, but also based on other factors that determine the size and form of application of a TE (Heady & Mansour, 2019).

Ideally, all new TEs should be evaluated through the lenses of the existing ex-ante assessment framework. This said, in situations where ex-ante assessments are not possible —for instance, if TEs are part of short-term crisis response packages— the framework may foresee the introduction of TEs as temporary measures, whose longer-term usage could be made conditional on an evaluation to be conducted at a later stage (Beer et al., 2022).

B. Ex-post evaluation framework

The minimum requirement of ex-post evaluations is to assess the costs and benefits triggered by an individual (or group of) TE(s). These evaluations frequently respond to rather specific policy concerns, for instance: is the use of fossil fuel subsidies in line with a country's ambitions to transform the energy system? Or have the TEs granted to companies and private households been effective in mitigating the impact of the COVID-19 pandemic?

However, the scope of costs and benefits assessed can vary. Are only direct benefits among target groups as well as direct costs in terms of revenue forgone considered, or does the evaluation include indirect costs and benefits as well? For instance, whereas several studies by international organisations discuss cost-benefit analyses of tax incentives for investment, their scope can vary considerably. Kronfol and Steenbergen (2020) present a framework focusing on the direct benefits of investment incentives. In contrast, a background paper on the use of tax incentives for investment, prepared by the International Monetary Fund (IMF), the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN), introduces a framework that captures direct as well as indirect effects of TEs (IMF et al., 2015).

Indeed, the scope and level of complexity (and, hence, the resources needed) of cost-benefit analyses can differ considerably depending on the evaluation criteria to be considered (e.g., effectiveness, efficiency, sustainability, policy coherence), the specific model to be used, the design features of the specific TE under review and data availability, among other factors. For instance, assessing the effectiveness of a tax benefit granted through the personal income tax (PIT) seeking to boost pension savings requires

having access to data on pension contributions as well as on other investment instruments to rule out potential re-shuffling between different investment mechanisms. If, on top of assessing effectiveness, the evaluation seeks to account for the distributive impact of that specific TE, administrative tax data might be needed as well.

Accounting for distributional effects based on incidence analyses is one way of capturing a specific undesired effect, but the question of which externalities to consider hinges upon political choices, data availability, budgetary questions and other factors. For instance, in the context of tax incentives for investment, should economic distortions and spillover effects also be considered, including cross-border effects on third countries?

These considerations highlight the complexity that TE evaluation can entail. Against this backdrop, it is not necessarily feasible, or cost-efficient, to evaluate all TEs in use on an annual basis. Nevertheless, it would be beneficial to evaluate all TEs periodically over a multiyear evaluation cycle, with an ex-post evaluation framework that sets the rules for the periodical evaluation of TEs, e.g., accounting for their size, so that large TEs are evaluated more frequently than small TEs. This is particularly relevant for countries that have a basic evaluation framework or are planning to start working in this area. There is no one-size-fits-all blueprint and, rather than a "big-bang" approach, TE evaluation should be considered as a gradual process where marginal improvements can have significant effects in terms of improving the effectiveness and efficiency of TE systems.

Finally, a crucial dimension regards the governance of TE evaluations. Evaluations of individual TEs or groups of TEs may be conducted upon the request of the legislature, the government itself, independent public control bodies such as audit offices, or even international actors such as bilateral donors and international financial institutions. Questions regarding the public availability of evaluations, but also the degree to which findings and recommendations are subsequently being taken up by the responsible authorities can be key determinants for the success in the rationalisation of TEs. These factors should therefore be considered when designing the evaluation framework. Likewise, timing (not only of the evaluation, but also of the publication of the results) could also be crucial to ensure that the expected impact can be triggered within the policy making process.

Yet, even sound institutional mechanisms, governance, and evaluation frameworks cannot ensure the alignment of TE systems with a government's growth and development strategies. The political economy is a crucial success factor for the rationalisation of TE —as important (if not more) as the estimation, reporting and evaluation of TEs. Box 2 illustrates this by discussing two cases with different outcomes in terms of policy impact.

Box 2
Ex-post evaluations do not necessarily lead to the expected policy impact

TE evaluation is a necessary but, by no means, a sufficient step towards TE reform. The South African Employment Tax Incentive (ETI) is a clear example of a TE provision that, besides proven costly and ineffective, remains in place and has even been expanded.

In response to the chronic and structural youth unemployment crisis in South Africa, ETI was introduced in 2014. Providing tax credits to firms for hiring young workers earning less than 6500 South African rands per month (around 347 dollars per month), the policy aimed to boost the hiring of young people by subsidising their wages. Budlender and Ebrahim (2021) evaluated the ETI and found that the incentive had no overall effect on youth employment. While small and medium sized firms increased the number of youth employees due to the tax incentive, large firms did not. And yet, large firms were the ones claiming the largest share of the subsidy. The tax credit paid out to firms amounted to 4.8 billion South African rands, equal to around 269 million dollars, in the fiscal year of 2019/20 and the policy was expanded significantly during the pandemic (Budlender and Ebrahim, 2022). Since its introduction, and even after this evaluation was conducted, the ETI has often been presented as one of the main policy tools to counteract youth unemployment and has been renewed or extended three times —recently until 2029. Indeed, the results of the evaluation by Budlender and Ebrahim (2021) were presented in several policy dialogues, discussed at labour union meetings, and presented together with suggestions of potential reforms to the parliament.

On the other hand, the Kingdom of the Netherlands provides the example of an evaluation that had triggered, up to a certain extent, the expected outcome in terms of concrete reforms in the design of an existing TE provision. Foreigners who migrate to the Kingdom of the Netherlands for work reasons can receive a tax-free reimbursement for the additional costs of that stay outside their country of origin for the first 8 years. This flat-rate reimbursement amounts to a maximum of 30 percent of the salary, provided the salary (in 2023) exceeds 41,954 euros per year, equivalent to around 45,814 dollars. The income limit stems from the goal of using the scheme to attract mostly highly qualified workers to the Dutch labour market. In addition, the place of origin of the worker must be more than 150 km from the Dutch border.

In 2017, an evaluation of the tax credit was conducted by an independent research firm where the effectiveness and efficiency in attracting migrants to the labour market was assessed (Brennenraedts et al., 2017). Whereas the overall outcome was positive, the study suggested three changes to the provision to further improve the efficiency: shortening the time span to 5 years, capping the beneficiary group to earners with wages up to 216,000 euros, equal to around 235,872 dollars, and increasing the 150-km distance to the border. In the end, the first two proposed changes were implemented, which significantly reduced the costs from 2021 onwards, and mitigated the regressive impact of the provision.

Source: Authors' elaboration, on the basis of J. Budlender y A. Ebrahim, "Has the Employment Tax Incentive created jobs?", 2022 [online] https://sa-tied.wider.unu.edu/article/has-the-employment-tax-incentive-created-jobs; "Estimating employment responses to South Africa's employment tax incentive", *SA-TIED Working Paper,* N° 187, 2021 [online] https://sa-tied.wider.unu.edu/sites/default/files/SA-TIED-WP187_0.pdf; R. Brennenraedts and others, "Evaluatie 30%-regeling", *Dialogic*, 2017 [online] https://www.dialogic.nl/wp-content/uploads/2017/06/Dialogic-Evaluatie-30-regeling-final-01-06-2017.pdf.

C. Correlation vs causality

Ideally, ex-post evaluations should seek to find a causal relation between the TE provision and the expected outcome, e.g., attracting foreign direct investment (FDI), boosting innovation or mitigating poverty. Yet, ensuring the existence and, even more so, quantifying a causal relationship can be a daunting task that requires specific skills and above all expertise in econometric modelling.

In some cases, evaluations are based on descriptive analyses, or limited by the quantity and quality of data. Yet, whereas in these cases, the evaluator might be able to confirm the existence of a simple correlation between a TE policy and certain outcome variables, this should not be confounded with a causal effect and, hence, should not be presented as "proof" of the effectiveness of the TE.

For instance, growing FDI flows or employment creation are sometimes presented as evidence on the effectiveness of tax incentives for investment. However, to assess whether a specific tax incentive was effective in boosting investment, one needs to be sure that the tax incentive being assessed is, indeed, triggering additional investment (that it is not redundant) and that there are no other confounding factors (e.g., a positive economic shock) that could have influenced the positive trend in investment. In econometrics, the latter is called *omitted variable bias,* and is one of the potential sources of endogeneity (Angrist and Pischke, 2009). If these confounding factors cannot be controlled for in the evaluation design, the results might be biased and, hence, the findings misleading. The annex provides examples of econometric models commonly used in ex-post evaluations to tackle potential endogeneity biases.

Another source of endogeneity is the so-called *reverse causality bias*, where the independent variable influences the dependent variable, but the reverse effect cannot be ruled out (Angrist and Pischke, 2009). Studies in the field of economic growth, for instance, often face the challenge of proving that tax systems (often proxied by tax revenue collection) can be a determinant of economic output (proxied by GDP). Whereas tax revenue does affect GDP, GDP also has a mechanic effect on tax revenues. In such a case, one needs to correct for the potential endogeneity to be sure that a causal effect exists.

III. International outlook: the current state of tax expenditure evaluations

According to the GTED, 106 countries have issued at least one TE report since 1990. The scope of these reports varies from country to country. At the same time, the number of countries that mention the results of evaluations in their TE reports is significantly lower. Out of the 106 reporting countries, only 16 have referenced, summarised, or included at least one evaluation in their reports.

Table 1 summarises the findings of an extensive search through the latest available TE report of countries in the GTED database. Whereas most of the 16 countries mentioned above only include a few generic references to evaluations in their reports, some refer to external documents containing multiple evaluations or summaries. Most evaluations are based on descriptive statistics of data overviews, surveys, public consultations, and distributional analyses. However, countries like the Republic of Korea and the Kingdom of the Netherlands have more complex evaluation frameworks that rely on inferential statistics to assess both direct and indirect effects of specific TEs. These evaluations tend to reflect a more sophisticated approach and rely on external evaluators who are not directly linked to the government. The main findings of the evaluations identified by this research exercise are summarized in the table 1. Their outcomes are heterogeneous, with some studies showing positive results, others presenting negative findings and some remaining inconclusive. For instance, two out of three evaluations of different VAT exemptions in Benin conclude that the specific TE had either produced more benefits than costs or achieved a positive effect on consumption habits. In contrast, the third evaluation finds that the costs of the TE have exceeded the benefits, and that the effects of the TE will likely undermine local production in the long run. Similarly, an evaluation conducted in Ireland questions the effectiveness of a tax reduction related to innovation and knowledge-intensive activities for failing to achieve the desired level of take-up and hence, having a modest impact.

Table 1

Overview of TE evaluation (based on latest TE report)

Country	Year	Referenced in report	Methodology used in evaluation	Type of tax
Benin	2021	Included	Data overview	VAT
Benin	2021	Included	Data overview	VAT
Benin	2021	Included	Data overview	VAT
Cameroon	2019	Included	Data overview	VAT
Canada	2022	Included	Gba+ and distributional analysis	PIT
Canada	2022	Included	Data overview and distributional analysis	PIT
Finland	2022 (evaluation 2020)	Linked	Game theory, data overview, and model with fixed effects	VAT
Finland	2022 (evaluation 2020)	Linked	Literature review and REFINAGE equilibrium model	VAT
Honduras	2021	Included	Cost benefit analysis	VAT, CIT
Honduras	2022	Included	Cost benefit analysis	CIT
Honduras	2022	Included	Cost benefit analysis	VAT, CIT
Indonesia	2024	Included	Data overview	CIT
Indonesia	2023	Included	Survey	VAT
Indonesia	2022	Included	Survey	CIT
Ireland	2022	Included	Data overview	PIT
Ireland	2022	Included	Public consultation	CIT
Ireland	2022	Included	Econometric analysis and public consultation	CIT
Ireland	2022	Included	Cost benefit analysis	CIT
Israel	2021	Included	Distributional analysis	VAT, PIT
Madagascar	2022	Included	Econometric model	VAT
South Africa	2023	Referenced	Summary of two previous reports and data overview	CIT
United Kingdom	2023	Linked	Survey, econometric analysis, and qualitative interviews	CIT
United Kingdom	2023	Included	Data overview and distributional analyses	Several
Australia	2023	Included	Distributional analyses	Several
Germany	2021	Referenced	See each evaluation	Several
Mexico	2020	Included	Distributional analyses	Several
Kingdom of the Netherlands	2022	Referenced	See each evaluation	Several
Republic of Korea	2023	Mentioned	See each evaluation	Several

Country	Beneficiaries	Type of TE	Category of TE (GTED defined)
Benin	Households	Exemption	Facilitate/increase access to electricity
Benin	Households	Exemption	Promote energy efficiency
Benin	Individual	Exemption	Support low-income households
Cameroon	Households	Exemption	Several
Canada	Individuals	Deduction & exemption	Promote gender equality
Canada	Individuals	Deductions	Encourage/promote/create employment
Finland	Individuals	Exemption	Develop the transportation sector
Finland	Several	Reduction	Promote exports/develop the transportation sector
Honduras	Firms	Tax credit & exemptions	Promote exports
Honduras	Firms	Tax credit & exemptions	Develop the tourism sector
Honduras	Firms	Exemption	Promote exports
Indonesia	Firms	Deductions	Promote knowledge-intensive activities
Indonesia	Firms	Exemptions	Provide pandemic relief
Indonesia	Firms	Reduction	Develop the financial services sector
Ireland	Individuals	Exemption	Encourage/promote/create employment
Ireland	Firms	Reduced rate	Promote knowledge-intensive activities
Ireland	Firms	Tax credit	Promote knowledge-intensive activities
Ireland	Firms	Tax credit	Support freedom of expression / support cultural/historical assets
Israel	Individuals	Tax credit & exemption	Promote gender equality
Madagascar	Individuals	Exemptions	Support low-income households
South Africa	Firms	Deduction	Promote knowledge-intensive activities
United Kingdom	Firms	Tax reduction	Support freedom of expression/support cultural/historical assets
United Kingdom	Several	Several	Several
Australia	Several	Several	Several
Germany	Several	Several	Several
Mexico	Several	Several	Several
Kingdom of the Netherlands	Several	Several	Several
Republic of Korea	Several	Several	Several

Country	Inferred SDG	Main findings
Benin	6. Clean water and sanitation	The cost of water consumption and electricity has been reduced for low-income households.
Benin	11. Sustainable cities and communities	The exemption has positively impacted domestic gas consumption habits.
Benin	2. Zero hunger	The measure cost more than it benefits, in the long run it can undermine local production.
Cameroon	Several	If abolished, the well-being for the poorest would deteriorate. Adjustments is although needed.
Canada	5. Gender equality	The new method used had an effect on the level but not distribution of beneficiaries by gender.
Canada	8. Decent work and economic growth	Claims are made by higher income groups and have been made by men to a large extent.
Finland	SDG not applicable	Subsidies for passenger shipping distort competition, but only for those within the direct market.
Finland	SDG not applicable	Among other things, the study suggests that the fuel taxation has significant environmental effects.
Honduras	9. Industry, innovation and infrastructure	No specific takeaways.
Honduras	9. Industry, innovation and infrastructure	Few investments made by those using the TE, but a positive effect was detected for job creation.
Honduras	9. Industry, innovation and infrastructure	Results imply a positive effect on firms applicable and has been a positive force in job creation.
Indonesia	9. Industry, innovation and infrastructure	Mainly utilized by the private sector and hope is that utilization will increase in the near future.
Indonesia	3. Good health and well-being	The item is appreciated by those firms applicable for it.
Indonesia	9. Industry, innovation and infrastructure	The incentive is considered to provide many advantages for the taxpayers.
Ireland	8. Decent work and economic growth	No specific takeaways
Ireland	9. Industry, innovation and infrastructure	The provision has never reached its desired level of take-up and the impact of it has been minimal
Ireland	9. Industry, innovation and infrastructure	Positive spill-over effects for employment, higher education, and the wider Irish business network.
Ireland	SDG not applicable	Results suggest unquantifiable benefits with social, cultural, and broad economic objectives.
Israel	5. Gender equality	Few female beneficiaries are a result of lower labor market participation and of lower wages.
Madagascar	2. Zero hunger	The tax incentives put in place have had little impact on consumer prices of post-covid households.
South Africa	9. Industry, innovation and infrastructure	An unintended outcome is that R&D employment has increased in beneficiary firms.
United Kingdom	SDG not applicable (could be 8 or 9)	The provisions have increase production and had positive spillover effects, such as on tourism.
United Kingdom	Several	See each evaluation
Australia	Several	See each evaluation
Germany	Several	See each evaluation
Mexico	Several	See each evaluation
Kingdom of the Netherlands	Several	See each evaluation
Republic of Korea	Several	See each evaluation

Country	Link to the reviewed te report
Benin	https://budgetbenin.bj/wp-content/uploads/2021/11/plf-2022-rapport-depenses-fiscales-2020-lf-2022.pdf
Benin	https://budgetbenin.bj/wp-content/uploads/2021/11/plf-2022-rapport-depenses-fiscales-2020-lf-2022.pdf
Benin	https://budgetbenin.bj/wp-content/uploads/2021/11/plf-2022-rapport-depenses-fiscales-2020-lf-2022.pdf
Cameroon	https://www.impots.cm/sites/default/files/publications/rapport%20sur%20les%20depenses%20fiscales%20-%20fr-def.pdf
Canada	https://www.canada.ca/en/department-finance/services/publications/federal-tax-expenditures/2022.html
Canada	https://www.canada.ca/en/department-finance/services/publications/federal-tax-expenditures/2022.html
Finland	https://vm.fi/documents/10623/307601/verotuet+2021%e2%80%932023.pdf/4e7bc5e6-2a07-4e82-5180-72e94064ea2d/verotuet+2021%e2%80%932023.pdf?t=1663657837278
Finland	https://vm.fi/documents/10623/307601/verotuet+2021%e2%80%932023.pdf/4e7bc5e6-2a07-4e82-5180-72e94064ea2d/verotuet+2021%e2%80%932023.pdf?t=1663657837278
Honduras	https://www.sefin.gob.hn/download_file.php?download_file=/wp-content/uploads/presupuesto/2022/proyecto/gasto_tributario_2022.pdf
Honduras	https://www.sefin.gob.hn/download_file.php?download_file=/wp-content/uploads/presupuesto/2022/proyecto/gasto_tributario_2022.pdf
Honduras	https://www.sefin.gob.hn/download_file.php?download_file=/wp-content/uploads/presupuesto/2022/proyecto/gasto_tributario_2022.pdf
Indonesia	https://fiskal.kemenkeu.go.id/publikasi/tax-expenditure-report
Indonesia	https://fiskal.kemenkeu.go.id/publikasi/tax-expenditure-report
Indonesia	https://fiskal.kemenkeu.go.id/publikasi/tax-expenditure-report
Ireland	https://www.gov.ie/en/publication/ccc22-budget-2023-taxation-measures/
Ireland	https://www.gov.ie/en/publication/ccc22-budget-2023-taxation-measures/
Ireland	https://www.gov.ie/en/publication/ccc22-budget-2023-taxation-measures/
Ireland	https://www.gov.ie/en/publication/ccc22-budget-2023-taxation-measures/
Israel	https://www.gov.il/blobfolder/policy/state-budget-main-2021-2022/he/state-budget_2021-2022_state-budget-main-2021-2022-file.pdf
Madagascar	http://www.mef.gov.mg/assets/vendor/ckeditor/plugins/kcfinder/upload/files/tome%202_lfi%202022_loi_n%c2%b02021-027.pdf
South Africa	https://www.treasury.gov.za/documents/national%20budget/2023/review/fullbr.pdf
United Kingdom	https://www.gov.uk/government/statistics/main-tax-expenditures-and-structural-reliefs/non-structural-tax-relief-statistics-january-2023#large_reliefs
United Kingdom	https://www.gov.uk/government/statistics/main-tax-expenditures-and-structural-reliefs/non-structural-tax-relief-statistics-january-2023#large_reliefs
Australia	https://treasury.gov.au/sites/default/files/2023-02/p2023-370286-teis.pdf
Germany	https://www.bundesfinanzministerium.de/content/de/downloads/broschueren_bestellservice/28-subventionsbericht.pdf?__blob=publicationfile&v=6
Mexico	https://www.gob.mx/cms/uploads/attachment/file/560811/pgf_2020.pdf
Kingdom of the Netherlands	https://www.tweedekamer.nl/kamerstukken/brieven_regering/detail?id=2022d34541&did=2022d34541
Republic of Korea	https://www.nabo.go.kr/sub/01report/01_03_board.jsp?funcsub=view&bid=19&arg_cid1=0&arg_cid2=0&arg_class_id=0&currentpage=0&pagesize=10&currentpagesub=0&pagesizesub=10&key_typesub=&keysub=&search_start_datesub=2023&search_end_datesub=2023&department=0&department_sub=0&etc_cate1=&etc_cate2=&sortby=reg_date&ascordesc=desc&search_key1=&etc_1=0&etc_2=0&tag_key=&arg_id=7976&item_id=7976&etc_1=0&etc_2=0&name2=0

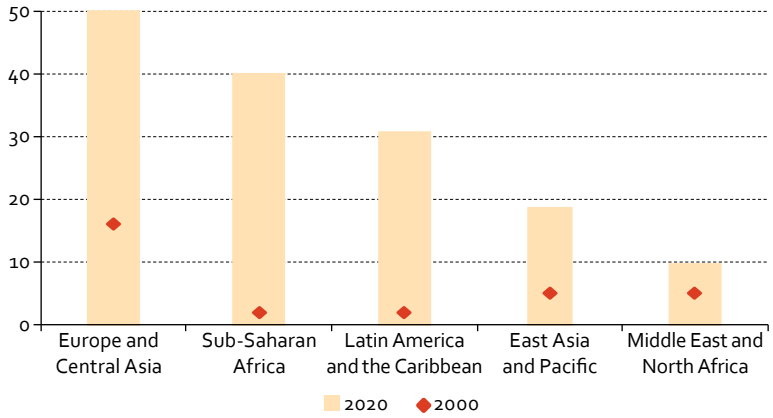
Source: Authors' elaboration.

As discussed in box 3, countries from Latin America and the Caribbean (LAC) have made significant progress in the estimation and reporting of TEs. Regarding evaluations, however, the situation does not differ from other regions: only two countries, Honduras and Mexico, refer to evaluations in their TE reports.

Box 3
The state of tax expenditure reporting and evaluation in Latin America

The number of countries reporting on TEs has increased globally over the past two decades. While in 2000 all regions except Europe & Central Asia had only one reporting country, the share of reporting countries has grown significantly since then (figure 1).

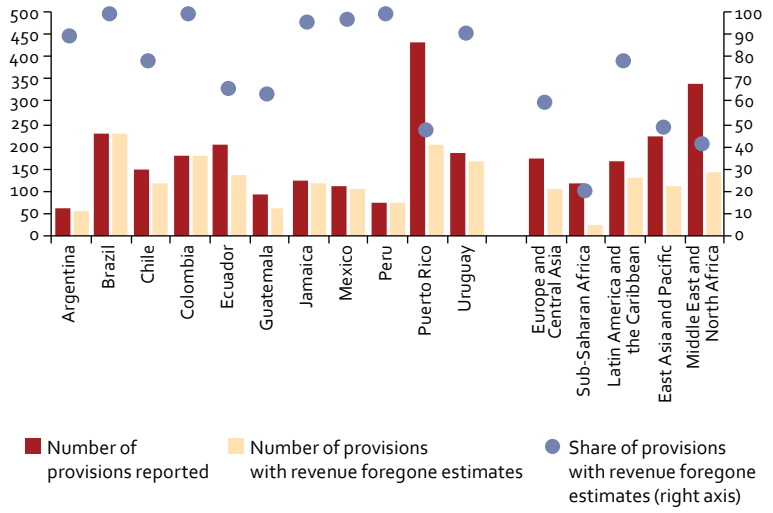
Figure 1
Share of reporting countries per region
(Percentages)



Source: GTED.

In 2020, 39 percent of Latin American & Caribbean (LAC) countries issued public TE reports according to the GTED, a share below Europe & Central Asia, similar to Sub-Saharan Africa, and considerably higher than East Asia & Pacific and Middle East & North Africa. Most countries in the LAC region have a legal obligation to report estimates of revenue forgone (Campos Vázquez, 2022). This is reflected in the high share of provisions with revenue forgone estimates (above 70 percent), which puts LAC at the top of all world regions (figure 2).

Figure 2
Number of TE provisions, provisions with Revenue Forgone (RF) estimates, and share of provisions with RF estimates in 2020
(Number of provisions and percentages)

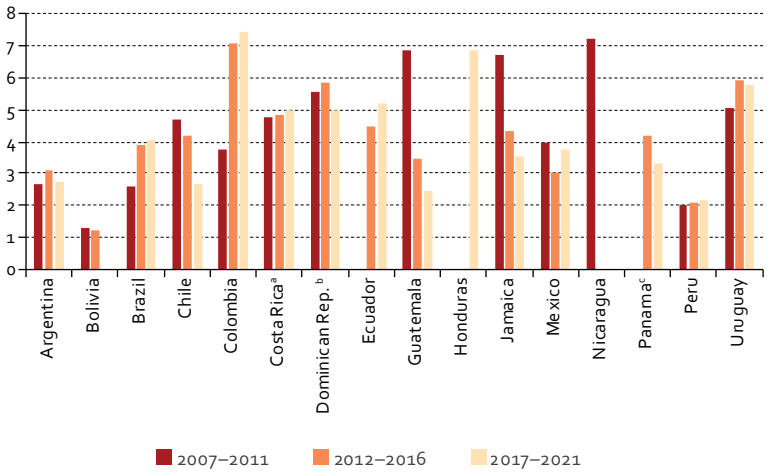


Source: GTED.
Note: Regional averages correspond to simple averages.

Estimating the fiscal cost of all TE provisions is crucial to inform political debates and contribute to evidence-based policy making in the field. Larger shares of TE provisions with revenue forgone estimates are therefore a relevant indicator for the quality of reporting. Yet, as discussed by Redonda and Neubig (2018), a larger share of estimated provisions does not necessarily mean that the report is more comprehensive, as it might be the case that not all provisions in use are included in the TE report. The question of whether a TE report is complete can be difficult to assess without an in-depth analysis of TE use in that specific country —particularly in those cases where the competencies for granting and managing TEs are shared by various authorities.

Improving transparency on the use of TEs is crucial since the revenue forgone stemming from TEs can be significant. However, the fiscal size of TEs varies by country. Figure 3 further illustrates the heterogeneity across countries in the region, with Argentina and Peru reporting significantly lower values than Colombia, the Dominican Republic and Uruguay, for instance.

Figure 3
Revenue Forgone
(Percentage of GDP)



[a] For Costa Rica, the values for 2007–2011 is an average over the period 2010–2011 because of missing data. For the period 2017–2021, the average covers 2017–2019.
[b] For Dominican Republic, the values for 2007–2011 is an average over the period 2008–2011 because of missing data. For the period 2017–2021, the average covers 2017–2020.
[c] For Panama, the values for 2017–2021 is an average over the period 2017–2019 because of missing data.

Source: GTED.

Source: Authors' elaboration.

It is important to note that evaluations may exist outside the TE reporting framework. Evaluations may be conducted by different actors —from ministries, the legislature, and other public agencies to NGOs, academic research centres or international organisations— and published in different formats (if at all). As a result, it is almost impossible to identify all TE evaluations across all regions. In the context of the present report, the search process has focused on evaluations mentioned in TE reports, which is in line with what can be considered best practice. As other measures with impact on the public budget, TEs should be subjected to regular evaluation, and the results of those evaluations should be made public. Presenting the results of TE evaluations in the context of TE reports increases the transparency of these policies and facilitates a clear overview of whether the system is effective and efficient.

There are a number of examples of TE evaluations that have been conducted without being mentioned in the respective TE reports. The United States, for example, does not reference any specific TE evaluations in its official TE report published as a section in the Analytical Perspective as part of the Budget, but the Congressional Budget Office (CBO) has published several evaluations, one of which covers the distributional impact of several large TEs in 2019 (CBO, 2021a). Two other evaluations by the

CBO have analysed the budgetary effect of some employee-related tax credits during the COVID-19 pandemic (CBO, 2021b; CBO, 2021c). South Africa is another example where several evaluations have been conducted without being included or mentioned in the TE report.

Some TEs have been evaluated by researchers, and sometimes, by public servants, within the programme Southern Africa –Towards Inclusive Economic Development (SA-TIED). For example, pension related TEs were evaluated by Axelson and Redonda (2021) and the distributional effect of medical expenditure by Mudimu and Nhamo (2020).

France does not mention or refer to any evaluations in its report, but an evaluation program for 2023 is described. The program will include evaluations of various tax measures in the overseas territory, tax measures related to the support of energy-saving renovations, TEs constituting state aid, and measures related to housing and the renovation of city centres. In addition, a broad review will be initiated assessing the efficiency of TEs in meeting the requirements of the ecological transition.

IV. Best practices in tax expenditure evaluation

TE evaluations differ widely across countries. Not only does the number of evaluated TE provisions vary, but also the quality and scope of analysis. This section reviews in depth three countries with well-developed TE evaluation frameworks: Canada, the Kingdom of the Netherlands and the Republic of Korea.

A. Canada

Canada is one of the few countries with evaluations of individual TEs conducted on a regular basis. These evaluations (one or two per year) are included in the annually published TE reports. The case of Canada is a nice illustration of how an incremental approach to evaluation can pay off and contribute to gradually building a sound evaluation framework.

The 2019 Report on Federal Tax Expenditures included the first gender-based analysis (called GBA+) of federal PIT-related expenditures. The main objectives of the analysis were to examine the overall impact of the 2016 federal PIT system on the distribution of income between men and women as well as the allocation of individual federal PIT expenditure benefits between genders. The results suggested that the progressive nature of the federal PIT system overall reduced income inequality between genders, as the share of after-tax income held by women was higher than the share of before-tax income. The overall redistributive impact of the federal PIT system was mainly driven by refundable tax credits and the progressive tax rate structure. Exemptions and non-refundable credits were also found to have a redistributive effect but of a more modest size, and deductions were found to favour men relatively more than women (Government of Canada, 2019).

Since 2019, the GBA+ has consistently been included in Canadian TE reports. In 2020, the GBA+ was conducted with a specific focus on family components. The analysis assessed if there was a certain group of beneficiaries that claimed the relief to a larger extent compared to others, and how the benefits were distributed within families. The result showed that women are more likely to claim family-related PIT expenditures as sole filers while male spouses claim them more often among couples. However, rules of application and economic incentives, such as higher benefits for the higher income spouse as claimant, tend to outweigh the role of gender (Government of Canada, 2020). The GBA+ analysis from 2021 diverged from the two previous evaluations by introducing additional factors beyond gender. In particular, the

study evaluated whether the system benefitted taxpayers based on age, income, family composition, or regional location. The analysis showed that, in general, the tax system tends to favour groups at the lower end of the income distribution. These three GBA+ analyses all utilized an approach that considered the reduction of net federal tax payable to identify the beneficiaries and associated benefits of varied TEs. The calculation of net federal tax payable is carried out before the allocation of refundable credits (Government of Canada, 2021). The latest GBA+, from 2022, developed a new approach which accounted for the indirect effect of refundable credits and examined the extent to which the new method affected the results of previous analyses. The new method increased the level of associated benefits but did not reveal a significant distributional impact by gender or by regional location. Minor changes were detectible concerning the distribution by age and family type, while the changes were larger when regarding the distribution by income quintile (Government of Canada, 2022).

B. Kingdom of the Netherlands

The Kingdom of the Netherlands is another country leading on TE evaluations. With a particularly high level of revenue forgone from the use of TEs, several reforms of the TE system have been implemented. In 2021, the Kingdom of the Netherlands had TEs amounting to 14.97 percent of GDP, which is considerably higher than the European Union and OECD averages, lying at 4.73 percent and 4.88 percent, respectively (Redonda, von Haldenwang, & Aliu, 2023). The income-dependent general tax credit, which is similar to an extra tax bracket, is one of the main drivers of this figure. Another factor is the fiscal treatment of the large pension sector.

The Court of Audit, an independent organization tasked with auditing the revenue and expenditure of the central government, found that TEs are used too often with too few restrictions, highlighting the need for reform. The framework for assessing and supervising TEs will be modernised in the upcoming years, and the current cabinet has tightened the budget rules for TEs. The number of TE evaluations has more than doubled from 50 in 2001 to 104 in 2021 (Tweede Kamer der Staten-Generaal, 2022).

The overall responsibility for each TE is allocated to the department responsible for the corresponding policy area. The Ministry of Finance and the ministers of the relevant departments are responsible for legislative regulation and evaluation in their respective areas. The Ministry of Finance bears the primary responsibility for fiscal legislation, the enforcement of fiscal policy, and fiscal accountability. The assessment framework of TEs is part of the Ministry of Finance's official "Budget Rules", and the ministry is required to forward it to the Cabinet and the Parliament. Each evaluation must follow the fiscal scheme assessment framework, and the Periodic Evaluation Research Regulation (Regeling Periodiek Evaluatieonderzoek) should be applied. This implies that the choice of the specific policy instrument should be evaluated, its effectiveness and efficiency examined, and the introduction of a sunset clause considered. Not all TE provisions are subject to evaluation, due to their limited policy or budgetary importance. This is the case, for example, for those provisions required by European law and regulations as well as for those that do not have a so-called outreach goal. In some cases, several TEs are evaluated jointly (Tweede Kamer der Staten-Generaal, 2022).

Many evaluations are conducted by institutions or consultancy agencies outside the government framework. All evaluations are referenced in the annual TE report, and a short summary of the results is presented. The TEs are evaluated over a multiyear cycle. In 2021, 75 TEs included in the evaluation framework had been subject to actual evaluation, while others had an evaluation planned for the upcoming years or were explicitly exempted from evaluation. Although 10 evaluations provided evidence on the efficiency and effectiveness of the respective TE, the majority arrived at ambiguous conclusions or reported a lack of empirical evidence. 27 evaluations presented a clearly negative outcome. Based on these findings, the Kingdom of the Netherlands government has initiated action to abolish several TEs, such as the gift exemption for owner-occupied homes and the private motor vehicle and motorcycle tax exemption for delivery vans (Tweede Kamer der Staten-Generaal, 2022).

C. Republic of Korea

The Republic of Korea has a well-structured framework for TE management, with evaluations being a central part of it. The system is based on three laws, the National Finance Act, the Framework Act on National Taxes, and the Restriction of Special Taxation Act. The first act defines a ceiling on national tax reductions, the second one lays out the requirements of long-term tax policy regarding TEs, and the third one defines the relevant tax codes and the framework for TE management. Yet, even though some TE evaluations are conducted on a more or less regular basis, all evaluations are discretionary rather than embedded in the law (National Assembly Budget Office, 2023).

TE management in the Republic of Korea is divided into two systems: one for national and another one for local TEs. This report focuses on the former. The national system consists of four stages, including a three-stage control mechanism. The first stage is the proposal of new TEs. The three-stage control mechanism comprises a pre-feasibility assessment, an operational evaluation, and a comprehensive study to be conducted before a TE expires (most TEs are managed under a sunset clause of three years). The operational evaluation is a self-assessment carried out by each ministry on the operational performance of a specific TE. These evaluations are reported to the Ministry of Economy and Finance (MOEF). The pre-feasibility assessment and the comprehensive study are administered by the MOEF but conducted by either the Korea Institute of Public Finance (KIPF) or the Korea Development Institute (KDI), the only two institutions allowed by law to perform TE evaluations. The process is monitored by an evaluation committee formed by the MOEF as well as other ministry officials and external experts (National Assembly Budget Office, 2023).

Both KIPF and KDI submit a research proposal to the evaluation committee once notified about an upcoming evaluation. Each proposal must include data requirements. Once one of the proposals is selected, the leading author of the research group is put in contact with the National Tax Service (NTS) for data support. Hence, data accessibility is ensured, and the research group can subsequently choose the most suitable method for the analysis. The pre-feasibility assessment is conducted prior to the establishment of a new TE. It focuses on the necessity, timeliness, expected effects, and potential problems of introducing the TE. The comprehensive study is an ex-post evaluation assessing the degree of goal attainment, economic effect, impact on income redistribution, and financial impact. Once completed, the reports are submitted to the MOEF and subsequently presented to the National Assembly (National Assembly Budget Office, 2023).

Jangwook (2018) from KDI provides an illustration of an evaluation conducted within this framework. The study assesses the effect of R&D tax credits on firms' financial capacities, and specifically how the external financing ability of a firm can impact on the effects of a R&D tax credit. The analysis shows that higher external financing costs make firms less responsive to the R&D tax credit, e.g., they increase R&D expenditures less. The study puts an additional focus on the R&D tax credit bracket for medium-sized firms, which was introduced in 2009, implementing a difference-in-differences (DiD)[7] design. The authors find that publicly traded medium-sized firms with a more direct access to external capital markets increased their R&D expenditures more than privately held ones, indicating that the tax credit's effect might depend on a firm's ability to raise capital. The study concluded that reducing firms' financing costs is critical for improving the effects of the tax credit.

[7] The DiD design is described in the annex.

V. Conclusions and policy recommendations

TEs are frequently used as tools to advance public policies, but they are rarely the object of regular and comprehensive evaluations. This is remarkable as the use of TEs generates substantial direct revenue losses, which for the 19 countries in the LAC region included in the GTED amounted, on average, to 4.3% of GDP between 1990 and 2020, or almost one third of tax revenue collected. Developing and implementing a framework for TE evaluations should hence be a priority for governments seeking to rationalise the use of TEs.

The present report has introduced the rationale as well as basic principles for the elaboration of comprehensive evaluation frameworks. Evaluations are a core component of the so-called "TE policy cycle", which covers the set-up of TEs, their operation and everyday management, the publication of reports, the elaboration of regular evaluations and, not least, the implementation of reforms aiming at rationalising the use of TE provisions.

In this policy cycle, evaluations enter at two different, though interrelated, stages: Ex-ante assessments are a key exercise to inform the design and introduction of TEs. Governments are sometimes legally required to prepare such assessments as part of the budget planning process. In most cases these are mainly descriptive documents, based on a set of guiding questions covering the objective, efficiency, suitability, and feasibility of the provision. However, ex-ante assessments may also include more elaborate forecasts of the budgetary impact and expected outcomes based on microsimulation or other economic models.

Ex-post evaluations (which includes evaluations of TEs currently in use) are necessary to improve the design and effectiveness of public policies and align the use of TEs with the long-term growth and development strategies of governments. As a minimum requirement, they should assess the impact and potential benefits triggered by an individual TE, or group of TEs. Ideally, they should link those benefits to the costs, e.g., through a cost-benefit analysis. Ex-post evaluations may sometimes respond to specific policy concerns. For instance, following the COVID-19 pandemic many governments were keen to find out whether the TEs they had introduced as immediate crisis responses had proven to be effective and efficient. Depending on the policy interest, but also on the type and scope of the TE under review, the design and data requirements of ex-post evaluations can differ widely. A key factor refers to the range of direct and indirect effects that the evaluation seeks to explore.

While it is true that ex-ante assessments and ex-post evaluations respond to different requirements in the policy process and may employ different methods and data sources, the present report identifies important overlaps and thus recommends that governments should elaborate joint frameworks that cover both stages. Ideally, the ex-ante assessment of a new (or modified) TE should generate relevant baseline data against which future effects and outcomes can be evaluated. Evaluation frameworks should be based on a common set of evaluation criteria:

- Relevance: What is the policy issue that the TE seeks to address? Is the TE (still) justified from an economic and social perspective?
- Fiscal cost: What is the estimated revenue forgone of the TE?
- Efficiency: Is the TE more efficient than alternative public policy instruments (for instance, direct transfers)?
- Impact: What are the expected or observed changes triggered by the TE?
- Side effects: What are the potential or observed spillover effects or externalities?
- M&E: Is the assessment embedded in an M&E framework that covers the governance, timeline, methods and data availability of the exercise?
- Policy coherence: Is the TE under review aligned with the general TE regime, the overall tax system, the budget, the medium-term fiscal and development strategies, and the international commitments of the country?

A key challenge facing TE evaluations refers the identification of causal effects between the TE and the outcomes it aspires to achieve. Simple correlations or observations of concomitant changes should not be taken as proof for such causal effects. Producing robust evidence usually requires creating a counterfactual (what would have happened without the TE under scrutiny?) and addressing endogeneity concerns emanating from omitted variables or reverse causality effects (see annex for a more detailed discussion of this aspect).

The present report has also revealed that TE evaluations are much less frequently used at a global scale than would be required to fulfil the functions described above. While a growing number of countries publishes annual TE reports with at least some revenue forgone estimates, very few countries have formulated comprehensive evaluation frameworks and enacted regular evaluation schedules to generate a sound body of evidence. For the LAC region, with its relatively high level of TE reporting, producing regular and comprehensive evaluations constitutes a necessary, and almost logical next step in the process towards a rational use of TEs.

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Annex

Establishing a causal relationship: methods used in ex-post TE evaluations

Several econometric techniques[8] or identification strategies aiming to draw causal inferences can be used in TE evaluations. Choosing the best approach depends on the research question, the research design features —such as the type of TE (e.g., exemptions, deferrals, tax credits), eligibility criteria, threshold values, etc.— and data availability. This annex provides an overview of what are arguably the most frequently used econometric approaches to evaluate TEs.

The regression discontinuity design (RDD) exploits the existence of a threshold rule that separates treated from non-treated units. Data points (observations) close to the threshold are very similar, but their outcome depends on the placement above or below the threshold. Technically, RDD specifications have a running (forcing) variable deciding on the treatment, such as the placement around the threshold and a cut-off value indicating the threshold itself. [9] The cut-off is a value of the running variable deciding who gets treated and who does not. For instance, an income below a certain amount qualifies a person for a specific tax benefit. For the analysis, a bandwidth is specified, determining the area around the cut-off within which observations are considered comparable enough. The rationale behind this process is that observations close to the cut-off —on either side of it— are basically the same, while observations further away from the cut-off are less similar. The choice of bandwidth involves a trade-off between efficiency and robustness. A bandwidth that is too large contains observations that might be less comparable, making the estimates more prone to confounding factors. On the other hand, a bandwidth that is too narrow includes too little data resulting in noisy estimates. In principle, there is no need for control variables other than the running variable. The RDD is invalid in the case where the threshold can be manipulated and when people can act strategically to place themselves above or below the threshold.

Risch (2022) studied the impact of a French energy tax credit introduced in 2005 on private household energy-saving renovations and the average expenditures per renovation by employing the RDD. Energy usage within the residential sector is mainly determined by building characteristics, but few households choose to invest in energy-saving options. The paradox is caused by market imperfections, for example, uncertainty regarding energy prices and the irreversibility of the investment. The fiscal incentive is, therefore, put in place to incentivise households to make energy-efficient decisions when renovating and offset the market imperfection. The threshold in the RDD design is the year the tax credit was introduced, the running variable is the years from 2001 to 2008 which also indicates the bandwidth, and treatment is whether a household is applicable for the tax credit (i.e., all households after 2005) or not. The study found that the incentive had a low effect on the decision to renovate but renovation expenditures increased among those qualifying for the credit. Thus, the tax credit only effectively incentivised households who had already decided to renovate to opt for a pricier and more energy-efficient renovation.

The instrumental variables (IV) approach is another model commonly used for estimating the causal effect of a treatment on its outcome in the presence of endogeneity. That is, in the case of estimating the effect of A on B while being unable to ascertain if unobservable factors such as C, D, and E also impact B. Given that these factors are unobservable, they cannot be controlled for, leading to the endogeneity problem. Consequently, there is one part of the effect of A on B correlated with the error term and one part that is not. An IV isolates the variation in the effect of A on B that is uncorrelated with the error term, allowing researchers to consistently estimate the causal effect. The instrument is picked so that it does not affect the outcome variable directly, other than through selection into treatment (exclusion restriction), while having a clear impact on this selection (first-stage effect). The primary challenge lies in finding a valid IV that satisfies both the first stage and the exclusion restriction.

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[8] For an in-depth discussion of the econometric techniques and their use see Angrist and Pischke (2009), Cunningham (2021), and Huntington-Klein (2021). The last two sources also include codes to programs like R, Stata, and Python.

[9] Treatment refers to an occasion where one group is exposed to a change that another group is not. This could be the introduction of a new tax benefit that affects a specific group of people, firms, or regions.

Fowkes, Sousa & Duncan (2015) used IVs in a dynamic setting to estimate the price elasticity of R&D with respect to the user cost of capital in an evaluation of an R&D tax credit in the United Kingdom. The price elasticity of R&D expenditure refers to the level of change in firms' R&D investments that is caused by changes in the user cost of capital for R&D investment. It was found that the benefits, in terms of social returns on R&D, of the incentive outweigh the cost in terms of tax revenues forgone. Leuven and Oosterbeek (2004) examined the impact of a tax deduction made available to Dutch employers when training employees above the age of 40. The authors employed an IV approach to identify the casual effect on wages of participation in trainings due to the tax deduction. In addition, the RDD was utilised to assess the impact of the deduction on the probability of worker participation in training and the effect of such participation on wages. Overall, the study concluded that the efficiency of the age-dependent tax deduction is discouraging for the purpose of stimulating training participation among the older population. One reason is that the age-dependent tax deduction likely resulted in the postponement of trainings since the study found a higher training rate of around 15-20 percent for workers aged just above 40 compared to those slightly below. The stimulating effect of the cost reduction cannot entirely explain this difference, especially not since the external effect of the tax credit on workers younger than 40 showed a net negative effect on training rates. Regarding the impact of training participation on wages, only a low wage return could be established, which is not unexpected since firms pay the full direct cost and only do so if a share of the returns can be recovered.

A third approach is a difference-in-differences (DiD) set-up. The approach utilises a scenario where one group is exposed to a treatment, such as a policy reform of an existing tax expenditure or the introduction of a new one, while another similar group is not. The outcome of interest in both groups before and after treatment is compared. The non-treated group represents what would have happened in the absence of treatment in the treated group, any additional change beyond this pertains to the effect of treatment. The econometric design relies on the assumption that the difference between the treated and non-treated groups would remain constant over time in the absence of treatment (parallel trends). Hence, controlling for confounding factors is particularly relevant. The validity of the DiD can be tested with placebo tests to corroborate the parallel trend assumption. It is important to check that the composition of the treated and non-treated groups does not change as a result of treatment, as this would cause the estimates to be biased.

Mardones and Madrid Becerra (2020) used the DiD and the matching with difference-in-differences (MDID) to conduct an ex-post evaluation of the R&D tax incentive law in Chile, which was created in 2008. The objective of the law was to boost the competitiveness of Chilean firms by introducing a tax credit for investments in R&D with third-party capabilities. The results showed some positive but modest effects on fostering innovation. However, the positive effect is lower than the rate of the tax credit, which indicates a low efficiency of the policy regarding its goal attainment. Ivus, Jose, and Sharma (2021) used the DiD design to evaluate the impact of an increased tax deduction rate for incentivising R&D in India. The reform was implemented in the fiscal year 2010-2011 and led to an increase in the weighted tax deduction rate from 150 percent for capital and revenue expenditure associated with in-house R&D to 200 percent. The reform implied that all firms from all sectors were eligible for the deduction if they are registered with the Department of Scientific and Industrial Research (DSIR). Prior to the reform, only firms in selected sectors qualified for the deduction. Since not all firms are registered with the DSIR, the authors use the group of non-registered firms as a control group. The study found that the policy reform resulted in lower user costs of R&D for firms registered with the DSIR together with increased R&D expenditure by firms and a higher frequency of patent applications at the Indian and U.S. Patent Offices. Subsequently, firms became more innovative and productive.

Lastly, propensity score is a matching approach on the probability of participating in a treatment. The probability that an individual unit gets treated conditional on the individual's observable characteristics yields the propensity score, which is a single-dimensional variable that summarizes how observables affect the treatment probability. The propensity score is obtained by first using necessary covariates (variables

capturing the characteristics) to estimate a maximum likelihood model for the conditional probability of treatment, usually a logit or probit model. Then, the predicted value from this estimation is collapsed into a single scalar which is the propensity score. So, instead of matching treated and untreated individuals on observables they are matched on the propensity score. The overlap assumption requires a treated and an untreated unit for each value of the propensity score which can be controlled by visually inspecting the density distribution graphically.

Bozio, Irac, and Py (2015) combined the DiD with propensity score matching when conducting an ex-post evaluation of the reform of a French research tax credit introduced in 2008 and its impact on firm's R&D and innovation. The propensity score matching analysis is conducted to compare firms that have taken advantage of the research tax credit to those who have not, based on observable characteristics. The evaluation found increased R&D expenditure for those firms benefitting from the tax credit relative to those that did not. However, no effect on innovation, measured by the number of patents at the firm level, could be found. Caiumi (2011) studied the impact of regional tax incentives for business investments in Italy using propensity score matching. The study draws several conclusions on the impact of the incentive, one being that the benefits do not outweigh the cost of providing the tax support.

There is no one-size-fits-all approach to evaluate TEs. Ideally, the choice of tools and models to be used, as well as the data requirements, depends on design features of the provision under review, and on the scope and depth of the evaluation. Yet very often the exact scope of the evaluation and the choice of methods depend on the availability of data.

Tax expenditures are deviations from the benchmark tax system which provides preferential tax treatment. Governments use them to pursue different policy goals, such as boosting innovation, creating employment or greening the economy. Their fiscal cost can be significant since the global average revenue forgone, estimated at around 4% of GDP and 25% of tax revenue, has remained stable over the last 30 years.

Evaluating tax expenditures against their stated policy objectives and the potential side effects or externalities they might trigger is a crucial step for the rationalization of tax expenditures, with implications for domestic resource mobilization and the alignment of tax policies with growth and development strategies.

This report analyses tax expenditure evaluation as a key element of the tax expenditure policy cycle and highlights the need for integrated frameworks that link ex-ante assessments with ex-post evaluations. It also provides an international overview of the state of tax expenditure evaluations, showing that it remains relatively underdeveloped, not only in Latin America and the Caribbean, but also across the world.

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