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R&D TAX INCENTIVES UNDER PILLAR TWO: EMPIRICAL EVIDENCE AND BEST PRACTICES

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10.1 Purpose and context of R&D tax incentives

Governments grant tax incentives to promote economic growth through increased investment, innovation, and employment. By reducing the effective tax liability, such incentives may effectively steer economic activities in favour of pre-defined policy targets.[69] Among these, research and development (R&D) tax incentives are widely used throughout the world (OECD, 2024) and considered well-justified. Their rationale is grounded in both economic and political considerations.

Economically, private investment in R&D is often deemed insufficient from a social perspective due to the public good characteristics of knowledge and the spillovers it generates. Tax incentives can help to address this market failure by lowering the after-tax cost of investment and thus encouraging investments associated with positive spillovers. In addition, they are also introduced to mitigate behavioural distortions caused by the tax system itself. Another argument in favour of R&D tax incentives is the information gap governments face when attempting to identify, ex ante, which technologies or sectors have the greatest potential for economic growth and positive spillovers. This uncertainty often limits the effectiveness of direct subsidies, as they are only granted to specific technologies or political areas of interest.

Beyond economic efficiency, political economy considerations influence the introduction of R&D tax incentives. International tax competition, in particular, is a major driving force, since foreign direct investment and profits derived from real activities are tax sensitive (Feld and Heckemeyer, 2011). However, the scope for a general race to the bottom on corporate income tax (CIT) rates is limited, as many countries face revenue constraints. Keeping tax rates high on less mobile activities and introducing tax incentives to attract mobile tax bases is a rational policy instrument (Janeba and Smart, 2003; Keen, 2001). However, several multilateral actions have been implemented to reduce the risk of harmful tax competition arising from national tax incentives, such as the EU Code of Conduct, the EU State Aid Rules and the OECD Forum on Harmful Tax Practices. In addition, the global minimum tax (Pillar Two), introduced to combat aggressive tax planning and set a floor on international tax competition, sets boundaries for the design of tax incentives for large firms. Since R&D tax incentives potentially reduce the effective tax rate (ETR) below a minimum level of 15%, an interaction between tax incentives and Pillar Two is key to identify the way forward for tax incentives.

When incentives are well-designed and successful in stimulating additional economic activity, governments can achieve revenue as well as social gains. However, depending on the incentives' generosity and induced competition effects, tax incentives can also erode tax revenue and cause unintended distortions. Indirect revenue costs associated with the tax incentive arise when the tax-favoured investment type crowds out higher-taxed alternatives (James, 2013). Beyond revenue costs, tax incentives may also incur non-revenue costs in the form of new distortions introduced, administrative and planning costs associated with receiving the incentive, and compliance costs.

Given the costs associated with introducing tax incentives and the limited public resources available, it is crucial to conduct thorough evaluations and cost-benefit analyses to make informed decisions about the appropriateness of each incentive (Beer et al., 2022). Evidence shows that once a country introduces preferential tax treatment, there is political pressure to expand its scope (Klemm and Van Parys, 2012). A sustainable tax policy, in particular under tight budgets, requires a careful balancing between tax revenues and policy goals (Gundert et al., 2024). Thus, it is relevant to analyse what characterises compelling and sustainable tax incentives.

This chapter identifies country best practices of R&D tax incentives, particularly in the context of Pillar

[69] Direct subsidies or grants, which countries may alternatively or additionally introduce to reach the desired policy goals, are not part of this chapter.

Two. It first reviews the empirical evidence on how R&D tax incentives affect investment decisions, taking into account different design options and uptake of the incentives. Next, it examines the compatibility of various R&D tax incentives with the global minimum tax. On that basis, it develops country best practices in designing and implementing these incentives to effectively stimulate private investment while minimising risks such as aggressive tax planning and harmful tax competition.

10.2 Lessons learned from the design and use of R&D tax incentives

Although tax incentives may be available for any type of tax, R&D tax incentives mainly focus on profit and payroll taxes (including social security contributions, SSC). In general, a distinction can be made between input-based incentives, such as accelerated depreciation, super deductions and tax credits, and output-based incentives, such as tax exemptions or reduced tax rates on specific types of intellectual property (IP) income (IP box regimes).

The most common form of R&D tax incentives are input-based schemes. As of 2023, 76 different **input-based tax incentives** were in place across OECD countries (OECD, 2025). The existence of 43 incentives within the EU stems from the fact that some countries, such as Bulgaria, Estonia, Latvia, and Malta, do not provide any incentives, while others offer multiple incentives simultaneously. Input-based incentives directly reduce the effective cost of R&D expenditure (e.g. wages, equipment, materials), thereby making more projects financially viable, especially those closer to the firm's profitability threshold (Hall, 1993). These incentives act as a tax shield, reducing the overall corporate tax burden in proportion to the firm's qualified R&D expenses, regardless of project success. While input-based incentives provide certainty as they are independent of uncertain future income streams, they are regularly limited by firms' tax liabilities, which can disadvantage start-ups or less profitable firms.

Empirical evidence consistently confirms that input-based incentives stimulate additional R&D investments in the countries implementing them. Earlier estimates suggest long-run elasticities of around -0.5 to -1 (Bloom et al., 2002), while recent firm-level studies report much higher values between -1.6 and up to -4.1 (Dechezleprêtre et al., 2023; Guceri and Liu, 2019; Rao, 2016). These differences partly reflect divergent assumptions about the actual uptake of R&D tax incentives. While cross-country analyses often assume full participation, in practice less than half of R&D-performing firms claim such relief, with substantial cross-country variation (Appelt et al., 2025). Failing to account for actual utilisation can lead to underestimating the effectiveness of tax relief programmes (e.g. Cui et al., 2022; Zwick, 2021).

Even in countries with mature systems, many eligible firms do not claim available support. Uptake is usually lower in the initial years after introduction due to limited awareness, the complexity of the application process, and the time required to adapt existing R&D processes (Appelt et al., 2025). Large firms, in particular, take longer to adjust their internal procedures than smaller firms. Still, small and medium-sized enterprises (SMEs) appear to favour increasing expenditure on subcontracted R&D rather than hiring new employees to maximise tax benefits and R&D activity (Agrawal et al., 2020).

In addition, uptake is higher if companies are eligible for greater benefits and if more generous design features are implemented, such as volume-based schemes and immediate refund options (Appelt et al., 2025). This is particularly important for SMEs, as research shows that tax incentives have a strong impact on R&D spending among SMEs that claim refundable tax credits due to insufficient CIT liabilities (Agrawal et al., 2020). Young SMEs appear to be especially responsive to R&D tax incentives, reflecting their heightened exposure to financing constraints (Appelt et al., 2025; Dechezleprêtre et al., 2023; Rao, 2016). Further research shows that estimates related to more

uncertain R&D tax incentive schemes[70] are on average less significant than estimates associated with clearer and more stable tax schemes. Moreover, introducing a ceiling or a pre-approval process does not relate to a decrease in the average effectiveness of R&D tax incentives (Blandinières and Steinbrenner, 2021).

Nowadays, governments are increasingly adopting **output-based R&D tax incentives**. As of 2023, 20 OECD countries and 14 EU Member States offered tax incentives related to IP income.[71] These incentives lower the applicable tax rate on income from successful R&D. This increases the expected after-tax return and supports profit retention, reinvestment within a country and a competitive tax environment for multinational enterprises (MNEs). With decreasing profit tax rates, the marginal benefit of investment increases as the return derived from the investment incurs a lower tax cost (Hall and Jorgenson, 1967). This should motivate firms to increase investment spending. However, firms need to anticipate a successful outcome from the investment in order to adopt their investment behaviour due to IP boxes (Hall, 2019).

The OECD guideline recommends restricting eligibility to IP income from trade intangibles, which is expected to generate higher positive spillover effects due to real R&D activity (Müller et al., 2022). Most IP box regimes observed align with this recommendation. The effective IP box rates within EU Member States range from 1.75% in Malta to 10.5% in Slovakia.

Evidence on whether output-based incentives stimulate additional R&D activity is more mixed. Early evaluations suggest that they did little to stimulate new R&D and instead primarily induced relocation of patents and associated income (Hall, 2019). This reflects the fact that such incentives reward successful outcomes rather than R&D activity itself and therefore may mainly influence where income is reported rather than where knowledge is created. The introduction of the modified nexus approach has tied preferential tax treatment to substantive R&D activity carried out within the granting jurisdiction. In line with this development, empirical evidence shows that countries with stricter substance and nexus requirements tend to have stronger links between IP box benefits and real economic activity, including increased employment of highly skilled workers and higher wages (Bornemann et al., 2023; Chen et al., 2023; Mohnen et al., 2017). Conversely, in countries with weaker substance requirements, increases in patent activity are more likely driven by patent relocations or acquisitions rather than new R&D investments (Bösenberg and Egger, 2017; Bradley et al., 2015). However, as most countries have nowadays implemented stricter nexus requirements following the OECD's modified nexus approach, the risk of pure patent relocation diminishes.

Nevertheless, the benefits of IP boxes are often accompanied by a decline in the average patent quality, raising concerns about the underlying innovative value of the additional patents (Bornemann et al., 2023). Gaessler et al. (2021), for example, describe patent boxes as a „relatively inefficient" tool for promoting inventive behaviour, particularly where preferential tax treatment is extended to include broader categories of IP income. Furthermore, increases in patent applications depend heavily on the industry (Alstadsæter et al., 2018; Bradley et al., 2015). Finally, there is also evidence that IP boxes alter the composition of the labour force rather than leading to an overall increase in employment levels (Bornemann et al., 2023).

The effectiveness of output-based incentives thus depends heavily on their design. Narrowly defined eligibility, limited to patents or software, reduces the risk of subsidising low-value IP, while overly broad definitions dilute the link to genuine R&D. Moreover, the

[70] For example, uncertainty can arise from changes to design features, the use of super deductions instead of tax credits, and the choice between carry-forward and immediate refund rules (Blandinières and Steinbrenner, 2021).

[71] Within EU Member States, tax exemptions are a less common instrument to stimulate R&D activity. Therefore, the following analysis focuses on IP box regimes.

compliance burden of nexus tracking can be substantial, especially for SMEs, further skewing benefits towards larger firms. Overall, while output-based measures can complement input-based incentives, they are less reliable as stand-alone tools for stimulating additional R&D.

Taken together, input-based incentives are superior to output-based ones in encouraging additional R&D efforts and minimise windfall gains. Furthermore, targeted design features, such as immediate refunds, volume-based schemes with ceilings, and clear eligibility criteria, enhance the accessibility and efficiency of these incentives. Although input-based incentives are generally effective in stimulating additional R&D, they are not without risks. Cheng et al. (2020) show that the tax-subsidised accumulation of IP can later facilitate profit shifting, particularly when combined with preferential tax regimes for IP income. Knoll et al. (2021) emphasise that within MNEs, R&D incentives may reallocate rather than increase global innovation, raising concerns about cross-border distortions. These findings underline the importance of embedding R&D tax incentives in a broader framework of international tax coordination and anti-abuse measures.

10.3 The future of R&D tax incentives under Pillar Two

In 2021, under the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS) more than 130 countries agreed on the implementation of a global minimum tax of 15% on profits generated by large companies (Pillar Two). The objective of Pillar Two is to combat aggressive tax planning and to set a floor on international tax competition. With the enactment of the Minimum Tax Directive[72] in 2022, EU Member States were required to implement the global minimum tax into national law by the end of 2023. This provision applies to affiliates of groups with annual consolidated revenues above 750 million EUR in at least two of the previous four years.[73]

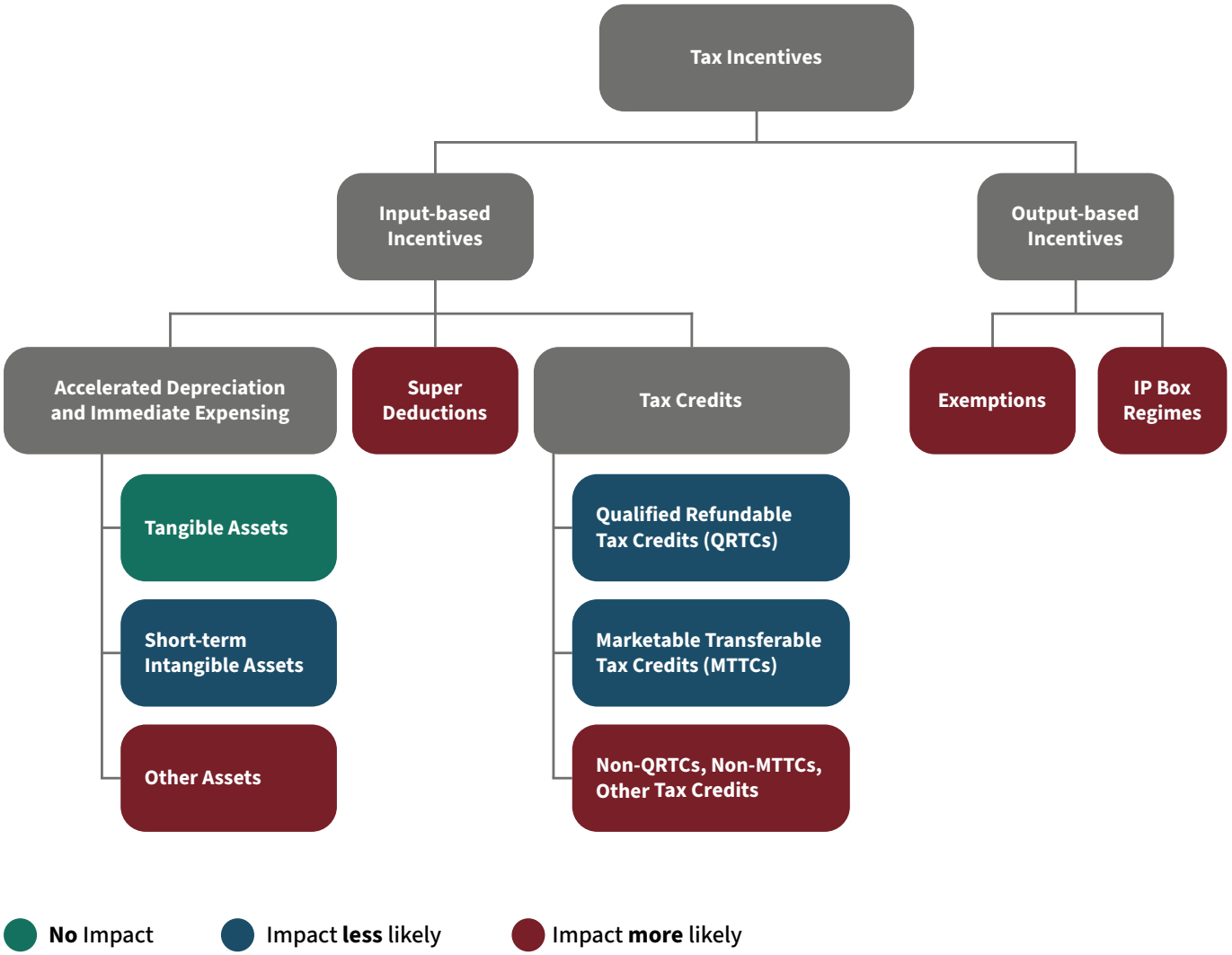
The core element of Pillar Two is the top-up tax, which is levied if a group is effectively taxed at a rate below 15%. The top-up tax percentage equals the difference between 15% and the group's ETR, which is determined under a jurisdictional blending approach, i.e. all group affiliates in a country are aggregated. The ETR under Pillar Two is defined as the ratio between the adjusted covered taxes and the net qualifying income, which are determined based on financial accounting standards and adjusted for various items. However, a routine profit from substantial economic activity as measured by tangible assets and payroll (substance-based income exclusion, SBIE) is exempt from the top-up tax and subject to the national tax level.

The top-up tax could diminish or even entirely reverse the investment incentives provided by tax reliefs. The impact of Pillar Two on a tax incentive depends on the extent to which the incentive affects the ETR – either by reducing the covered taxes or by increasing the net qualifying income – and on the interaction of the incentive with the SBIE (OECD, 2022). Figure 10.1 summarises to what extent Pillar Two is likely to affect the tax benefits granted by different types of tax incentives. However, the specific impact of Pillar Two on tax incentives also depends on the country's tax system, on the affected firm's characteristics and

[72] Council Directive (EU) 2022/2523 of 14 December 2022 on ensuring a global minimum level of taxation for multinational enterprise groups and large-scale domestic groups in the Union.

[73] As of November 2025, 60 countries worldwide have enacted final or draft legislation to implement the global minimum tax (EY, BEPS 2.0 Pillar Two Developments Tracker). Notably, in January 2025, the US President announced that the two-pillar project would have no effect in the US (https://www.whitehouse.gov/presidential-actions/2025/01/the-organization-for-economic-co-operation-and-development-oecd-global-tax-deal-global-tax-deal/). In June 2025, the G7 and the US Treasury agreed on a "side-by-side" system that excludes US MNEs from the scope of Pillar Two (https://home.treasury.gov/news/press-releases/sb0181).

Figure 10.1: The impact of different tax incentives on the ETR under Pillar Two



Source: Own illustration.

Note: This figure shows to what extent Pillar Two is likely to affect the tax benefits granted by different types of tax incentives.

activities, and on the design of the incentive (OECD, 2022).

To incentivise R&D activities, countries grant accelerated depreciation or immediate expensing schemes. While the cost of an asset is also depreciated for accounting purposes, the specific tax depreciation rules usually differ from the accounting rules. As Pillar Two relies on financial accounting standards to determine the ETR, these differences are important to consider. Accelerated depreciation results in lower taxable profits and consequently lower taxes paid in early years (i.e. when the tax depreciation exceeds the accounting depreciation). This timing difference between tax and financial accounts is considered by creating a deferred tax liability (Ferreira Liotti et al., 2022). Under Pillar Two, covered taxes do not only include current taxes but also deferred taxes. Therefore, the ETR under Pillar Two is not affected by accelerated depreciation or immediate expensing schemes granted for tangible assets and short-term intangible assets (Bammens and Bettens, 2023; OECD, 2022). In contrast, due to a

recapture rule, accelerated depreciation or immediate expensing of long-term intangible assets is likely to be affected and could generate a top-up tax (OECD, 2022).

Some countries even grant super deductions for R&D expenses, allowing firms to deduct a higher amount of expenses for personnel and/or assets used for R&D from their tax base than actually incurred. While super deductions are reflected in tax accounts, they do not exist for financial accounting purposes. Therefore, they reduce the tax base and also the covered taxes compared to a scenario without such a deduction. In contrast, the net qualifying income is unaffected as the super deduction does not exist for financial accounting purposes. In sum, the ETR therefore decreases and could potentially give rise to a top-up tax liability (OECD, 2022).

While tax deductions reduce the tax base, tax credits directly reduce the tax liability. For Pillar Two purposes, there is an important distinction between various types of tax credits that have different consequences. Tax credits are categorised into the following five types: Qualified Refundable Tax Credits (QRTCs)[74], Non-Qualified Refundable Tax Credits (Non-QRTCs)[75], Marketable Transferable Tax Credits (MTTCs)[76], Non-Marketable Transferable Tax Credits (Non-MTTCs)[77], and Other Tax Credits (OTCs)[78]. QRTCs and MTTCs are treated as income and therefore added to the net qualifying income in their origination year. In contrast, Non-QRTCs, Non-MTTCs, and OTCs reduce covered taxes (OECD, 2023). As a result, all types of tax credits reduce the ETR, but the effect is less significant for QRTCs and MTTCs as they affect the denominator rather than the numerator of the ETR. At the same time, however, the treatment of QRTCs and MTTCs as income also increases the tax base for the top-up tax, which is defined as the net qualifying income (UNCTAD, 2022).

In addition to input-based incentives, output-based incentives such as IP box regimes can affect a firm's ETR under Pillar Two. IP box regimes reduce the covered taxes, while the IP income is reflected in the net qualifying income, thereby lowering the ETR. However, the specific effect on the ETR depends on the design of the regime, the applicable tax rate to other types of income, and the share of IP income to other income in a country (Ferreira Liotti et al., 2022).

A further factor particularly determining the impact of Pillar Two is the SBIE that exempts a routine profit from substantial economic activity from the top-up tax. All of the aforementioned input-based incentives, i.e. accelerated depreciation schemes, super deductions, and tax credits, require a certain level of substance in terms of personnel and/or tangible assets. The same applies to IP box regimes following the modified nexus approach, which encourage firms to conduct their R&D activities in the country offering the regime. Therefore, firms whose R&D activities heavily depend on personnel and tangible assets are likely to benefit from the SBIE and thus be less affected by Pillar Two (UNCTAD, 2022).

To incentivise investment even after the implementation of Pillar Two, governments may consider reassessing their tax incentive regimes. In general, however, it should be noted that Pillar Two only applies to a subset of firms. Firms that are out of scope continue to benefit from tax incentives without being affected

[74] A Qualified Refundable Tax Credit is defined as a refundable tax credit that must be paid as cash or cash equivalent within four years from when a firm is entitled to receive the credit (Article 3 (38) Minimum Tax Directive, 2022).

[75] A Non-Qualified Refundable Tax Credit is defined as a tax credit that is refundable as cash or cash equivalent after four years (Article 3 (39) Minimum Tax Directive, 2022).

[76] A Marketable Transferable Tax Credit is a tax credit that can be transferred to an unrelated party within a certain timeframe at a price equal or above the marketable price floor, which equals 80% of the net present value of the tax credit (OECD, 2023).

[77] A Non-Marketable Transferable Tax Credit is defined as a tax credit that is transferable but is not a MTTC (OECD, 2023).

[78] Other Tax Credits are non-refundable and non-transferable tax credits that can only be used to offset the tax liability of the eligible taxpayer (OECD, 2023).

by any interactions between the incentives and Pillar Two. Therefore, governments may continue to grant incentives, especially if they are effective, to out-of-scope firms (OECD, 2022). On the other hand, for in-scope firms the effectiveness of tax incentives may be curtailed by Pillar Two. However, it is important to consider that the tax benefit granted by incentives may only be reduced or reversed by Pillar Two if a firm's ETR is below 15%. As a result, high-tax countries may not necessarily have to redesign their tax incentive policies since the likelihood of firms being affected by a top-up tax is relatively low.

As shown above, input-based incentives are less affected and thus favoured under Pillar Two. This is in line with the empirical literature supporting the implementation of input-based rather than output-based incentives. Specifically, governments may grant accelerated depreciation schemes for tangible assets, as they are unaffected. Tax credits classified as QRTCs or MTTCs are less impacted by Pillar Two, which may result in more governments introducing or revising their tax credits such that they meet the definition of a QRTC or MTTC. Furthermore, countries could be incentivised to offer grant schemes, which are treated like QRTCs and MTTCs. Policymakers should also consider to what extent their tax incentives require substance as measured by payroll and tangible assets, as these types of incentives are less affected by Pillar Two. Overall, governments should reassess the specific design of their incentives, since certain design features could undermine the tax benefits of the incentives under Pillar Two.

10.4 Country best practices on R&D tax incentives under Pillar Two

Based on the above insights, this section identifies country best practices on R&D tax incentives. According to the Platform for Collaboration on Tax (PCT) effective R&D tax incentives should be guided by six overarching principles: justification, design, international considerations, legislation, implementation and evaluation (PCT, 2025). Translating these dimensions into practice yields five interrelated best-practice characteristics:

(1) non-selective incentives with respect to eligibility groups,
(2) incentives targeted in scope,
(3) incentives with direct impact on liquidity,
(4) salient and transparent incentives to maximise uptake and minimise compliance costs, and
(5) incentives that are easy to administer and monitor.

First, tax incentives should be non-selective with respect to eligibility groups, i.e. they should be granted to all taxpayers independent of specific characteristics, in line with the general idea of a good tax system being fair. A narrow targeting of specific taxpayers is prone to misjudgement, as it is usually difficult for governments to accurately anticipate which technology or sector has the most promising growth perspectives or the most convincing potential for positive spillover effects. In particular, the de facto industry selectivity of IP box regimes is a key disadvantage. Not all outputs of R&D activity benefit from IP boxes, which are with few exceptions limited to profits from patents and related rights. However, patents and associated royalty payments play a central role in only a limited number of industries (Spengel et al., 2022).

By contrast, input-based incentives that are granted universally to all taxpayers engaged in eligible R&D activities represent a best practice. Such incentives avoid sectoral bias and help to ensure a more neutral allocation of support. In the context of Pillar Two, only affiliates of large groups are affected by any interactions of Pillar Two and R&D tax incentives. However, a distinction between different incentives for firms within and out of scope of Pillar Two should be avoided. Therefore, tax incentives should be targeted to all firms independent of their size, sector, and other characteristics. This also reduces complexity of the tax incentive system.

Second, there is inevitably a trade-off with respect to the ideal scope of a R&D tax incentive. According to the PCT, incentives should be targeted as closely as possible to the expected source of social benefit. While this notion rules out output-based incentives, it is rather impractical to pin down the exact type of expense creating the spillover effect. A simple solution

is to define a broad base of eligible expenses, such as R&D wages, allowances for machinery and buildings, and overhead costs. Moreover, subcontracted or outsourced R&D expenditures should be included to ensure that external research activities are not disadvantaged compared to in-house R&D. To limit windfall gains for large MNEs and to reduce fiscal costs for governments, a ceiling, i.e. a cap on the maximum claimable benefit, may be introduced. At the same time, ceilings are often not binding for SMEs, which are the most responsive to R&D tax incentives as their R&D expenditures generally fall below the threshold, allowing them to fully benefit from the incentives.

Third, the mechanism of how tax incentives stimulate investment involves the liquidity impact of the tax saving. To maximise this effect, the liquidity should be granted as direct as possible. Incentives that can be offset against payroll taxes or SSCs are highly effective in this regard, as the liquidity effect of the tax benefit occurs promptly within the same month. In addition, even firms with a negative CIT base benefit from this incentive design. This is of particular relevance during economic crises or for firms experiencing losses at the beginning of their lifecycle. Instead of crediting against payroll taxes, the second-best option for loss-making firms is an immediate cash refund, allowing them to benefit from the tax incentive earlier rather than having to carry it forward.

Fourth, for input-based incentives to be effective, they must be designed to be salient, transparent, and easily accessible to maximise uptake and minimise compliance costs. Our overview of the empirical evidence shows that stability and predictability are crucial factors influencing firms' decisions to engage with R&D tax incentive schemes. Among the available instruments, R&D tax credits are considered best practice for delivering input-based support. They offer a clear, direct reduction in tax liability based on qualifying R&D expenditures and are generally easier for firms to integrate into their financial planning. In particular, volume-based R&D tax credits that apply to the total amount of qualifying expenditure provide predictability and simplicity, reducing both uncertainty and administrative burdens for taxpayers. Under Pillar Two, volume-based tax credits classified as QRTCs are less likely to be impacted, provided they are refundable within four years. While such credits can reduce a firm's ETR and potentially trigger a top-up tax, in particular under a volume-based scheme and with a broad definition of expenses, ceilings and the SBIE offer mitigating effects. Overall, refundable, volume-based tax credits with a broad scope remain a best practice, even under Pillar Two.

In addition, R&D incentives should be structured as permanent features of the tax system rather than temporary measures. Permanence increases certainty and allows firms to incorporate expected benefits into long-term R&D planning. While temporary incentives may be appropriate for general investment support during economic downturns, the same approach is less effective for fostering sustained R&D activity, which typically requires long-term commitment. In the context of current legislative changes, a recent Belgian incentive reform proposal included a provision that would fix the applicable rates and include them in law instead of being subject to annual changes, with the explicit aim to improve legal certainty and foreseeability.[79] Although permanence is desirable for predictability, permanent measures often lack systematic review. Incorporating regular evaluations of R&D tax incentives' uptake, fiscal cost, and distribution across firm types preserves transparency and allows for timely adjustment, thereby aligning permanence with evidence-based policymaking.

Furthermore, limiting the number of parallel R&D tax incentives within a country helps to simplify the system, thereby reducing compliance costs for businesses and easing the administrative burden on tax authorities. For instance, the UK recently merged two of their tax incentives into a single scheme with the objective to simplify their R&D incentive regime.[80] A streamlined,

[79] https://www.ey.com/en_be/technical/tax/tax-alerts/2024/belgium-modernizes-its-investment-deduction-regime-and-enhances-its-ip-regime.

[80] https://www.grantthornton.co.uk/insights/guide-to-rd-reform-as-uk-moves-to-a-merged-regime/.

transparent incentive structure not only facilitates uptake, especially by SMEs, but also enhances the overall effectiveness of fiscal R&D policies.

Finally, a best practice for R&D tax incentives is to ensure that the incentives are easy to administer and monitor, especially for small firms. A simplified, transparent structure minimises the administrative burden and encourages more companies to apply. To further ease the process, the application should be straightforward and follow a digital one-stop system. In the EU, Member States such as Belgium[81], Germany[82], and Sweden[83] recently announced to reform their tax incentive systems by simplifying and streamlining their application procedures. While the implementation of pre-approval procedures may impose administrative costs on the involved parties, they increase predictability for both taxpayers and governments by providing clarity on which projects and expenses qualify for support.

Table 10.1 in the Appendix provides an overview of existing input-based R&D tax incentives in the EU and highlights to what extent they fulfil the best practice criteria. Overall, most EU Member States perform well in terms of scope. The majority does not restrict access based on the type of eligible taxpayers, and all 43 incentives examined include a volume-based component. All EU Member States in our sample offer at least one incentive covering labour and current R&D expenditures, which typically represent the largest share of R&D costs. Yet, best practice suggests that integrating both current and capital R&D expenses into a single incentive enhances administrative efficiency for both firms and tax authorities. Taken together, 20 incentives have a comparably broad base that includes subcontracted R&D expenses, an important feature particularly for SMEs, which often lack sufficient internal R&D capacity.

However, greater variation emerges with regard to the instrument type and the liquidity impact. Among the 43 R&D incentives examined, only 14 qualify as volume-based tax credits, and just eight offer immediate refunds, either through offsets against CIT or against payroll taxes and SSCs. Thereby the latter provides the fastest liquidity effects. In contrast, countries like Italy, Ireland, Belgium and France defer refund payments to later periods, potentially limiting the short-term cash flow benefits for firms. Nevertheless, all of these refundable tax credits are likely to qualify as QRTCs and are therefore less impacted by Pillar Two.

Finally, while no single EU Member State fully meets all identified best practice criteria, some countries have implemented several key features that exemplify best practice. Among the existing tax incentives, the Dutch R&D tax credit (WBSO) stands out as fulfilling most of the identified best practice criteria. It is accessible to all types of taxpayers engaged in R&D activities, is designed as a volume-based credit offset against monthly payroll taxes and SSCs and allows for a broad base of internal R&D expenses. However, it does not permit the inclusion of subcontracted R&D expenses. In contrast, the German tax credit (Forschungszulage) has a broader scope, including outsourced R&D expenses, yet it is offset against the CIT, resulting in a less immediate liquidity impact. Similarly, the R&D tax credits in Ireland and Italy have a generous scope in terms of eligible taxpayers and expenses, but they limit the immediate cash benefit by distributing refunds over three annual instalments. Austria, meanwhile, restricts eligibility for the volume-based, refundable tax credit to current R&D expenditures only. Finally, the payroll and SSC tax credits available in Belgium (for research facilities) and France (for young innovative firms) offer rapid liquidity benefits but are limited in scope, as they apply only to certain taxpayer categories and cover labour costs exclusively.

[81] https://www.ey.com/en_be/technical/tax/tax-alerts/2024/belgium-modernizes-its-investment-deduction-regime-and-enhances-its-ip-regime

[82] https://www.bundesfinanzministerium.de/Content/DE/Pressemitteilungen/Finanzpolitik/2025/06/2025-06-04-kabinett-beschliesst-wachstumsbooster.html.

[83] https://www.ey.com/en_se/insights/tax/why-sweden-s-proposed-r-d-tax-changes-mark-a-positive-step-forward.

10.5 Conclusion

To stimulate private investment in innovation, address existing market failures, and foster long-term economic growth, many countries grant R&D tax incentives. The effectiveness of these incentives in stimulating additional R&D activity depends on their generosity, specific design and administrative features, and the broader investment climate in which they operate. To maximise their effectiveness, R&D tax incentives should be targeted at generating positive spillover effects and additionality, while minimising windfall gains. Comprehensive and regular evaluations are therefore essential to assess whether each incentive continues to achieve its intended objectives, and to facilitate meaningful comparisons with alternative policy instruments.

Despite generous policy frameworks, incomplete uptake of R&D tax incentives remains a key challenge. Even in countries with mature R&D tax systems, many eligible firms, particularly SMEs, fail to claim available support, moderating the overall effectiveness of these incentives. Addressing awareness and accessibility barriers should therefore be a priority for policymakers seeking to increase the impact of tax incentives.

This chapter has shown that a well-balanced incentive design should incorporate broad eligibility, targeted scope, simplicity, timely liquidity, and streamlined administration to maximise its impact. To enhance the effectiveness of R&D tax incentives, while ensuring fairness, efficiency, and compliance with international frameworks such as Pillar Two, governments should aim to integrate these best practices into their policy design. Notably, the continued reliance on super deductions in several EU Member States may present challenges, particularly when aiming to implement a single, unified R&D tax incentive accessible to all types of eligible taxpayers. A balanced approach combining the aforementioned best practices offers the greatest potential to foster innovation and generate sustainable economic benefits.

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Table 10.1: Overview of Input-based R&D Tax Incentives in the EU based on Best Practice Criteria

	Type			Offset against			Scope					Liquidity			Pre-approval
	Tax Credit	Accelerated Depreciation	Super Deduction	CIT	PWHT/SSC	Other Taxes	Eligible Taxpayer	Incentive Base	Expense Base	Subcontracted R&D	Ceiling	Immediate Refund	Carry-over & Refund ≤ 4 Years	Carry-over	
AT	**x**			x			**All**	**V**	C	**x**	x	**x**			**x**
BE		x		x			**All**	**V**	ME	-	-	-	-	-	-
BE	**x**				**x**		Research facilities	**V**	L	-	x	**x**			-
BE			**x**	x			**All**	**V**	Green R&D: ME, I, B	-	x			x	**x**
BE	**x**			x			Firms with research centre	**V**	ME, I, B	-	x		(x)[a]		**x**
HR			**x**	x			**All**	**V**	**C, MED**	**x**	x			x	**x**
CY			**x**	x			**All**	**V**	**C, I**	**x**	-			x	-
CZ			**x**	x			**All**	H	**C, MED**	**x**	-			x	**(x)[b]**
DK		**x**		x			**All**	**V**	ME	-	-	-	-	-	-
DK			**x**	x			**All**	**V**	**C, ME, BD**	**x**	x			x	-
DK	**x**			x			All (deficit-related R&D)	**V**	**C, ME, BD**	**x**	x	**x**			-
FI			**x**	x			**All**	**V**	Collaborative R&D	**x**	x			x	-
FI			**x**	x			**All**	**V**	C	**x**	x			x	-
FR		**x**		x			**All**	**V**	ME	-	-			x	-
FR	**x**				**x**		Young innovative firms	**V**	L	-	x	**x**			**(x)[b]**
FR	**x**			x			**All**	**V**	**C, MED, BD**	**x**	x	(x)[c]	x		**(x)[b]**
FR	**x**			x			**All**	**V**	Collaborative R&D	**x**	x	-	-	-	**x**
DE	**x**			x			**All**	**V**	**C, MED[a]**	**x**	x	**x**			**x**
GR	-	**-**	**x**	x			**All**	**V**	**C, MED**	**x**	-			x	**x**
HU	**x**			x			**All**	**V**	**C, ME, B, I**	-	x			x	**x**
HU			x			x	Large, medium-sized firms	**V**	**C, ME, B, I**	**x**	-	-	-	-	**(x)[b]**
HU			**x**	x			**All**	**V**	**C, ME. B, I**	**x**	x			x	**(x)[b]**

	Type			Offset against			Scope					Liquidity			Pre-approval
	Tax Credit	Accelerated Depreciation	Super Deduction	CIT	PWHT/SSC	Other Taxes	Eligible Taxpayer	Incentive Base	Expense Base	Subcontracted R&D	Ceiling	Immediate Refund	Carry-over & Refund ≤ 4 Years	Carry-over	
HU	x				x		Research facilities	V	L	-	x	x			-
HU	x[d]				x		Research facilities	V	L	-	x	(x)			-
HU	x				x		SME Research facilities	V	L	-	x	x			-
HU	x[d]				x		SME Research facilities	V	L	-	x	(x)			-
IE		x		x			All	V	ME, B	-	-	-	-	-	
IE	x			x			All	V	C, ME, B, I	x	x	(x)[e]		(x)[e]	-
IT			x	x			All	V	C, MED, I	x	-			x	-
IT	x			x	x		All	V	C, MED	x	x	(x)[e]		(x)[e]	-
LT		x		x			All	V	ME, I	-	-			x	x
LT			x	x			All	V	C	x	-	-	-	-	(x)[b]
NL	x				x		All	V	C, ME, B, I	-	-	x			x
PL			x	x			All	V	C, MED, ID	x	-	-	-	-	-
PT	x			x			All	H	C, ME, I	x	x			x	x
RO			x	x			All	V	C, MED, BD, ID	x	-			x	(x)[b]
SK			x	x			All	V	C, ME, B, I	x	x			x	x
SK			x	x			All	H	C, ME, B, I	x	-			x	-
SL			x	x			All	V	C, ME, I	x	x			x	x
ES		x		x			All	V	ME, I, B	-	-	-	-	-	x
ES	x			x			All	H	C, ME, I	x	x	(x)[f]		x	x
ES	x[d]				x		All	V	L	-	x	(x)			x
SE	x[d]				x		All	V	L	-	x	(x)			-

Source: Own illustration, based on OECD (2025).

Note: Best practices within each evaluation and design criterion are highlighted in grey. Incentive bases are either volume-based (V) or hybrid (H). Expenses could include current expenses (C), labour expenses (L), machinery and equipment (ME), buildings (B), intangibles (I), depreciation on machinery and equipment (MED), buildings (BD) or intangibles (ID). [a] Considering current legislative changes. [b] Pre-approval is optional. [c] Only applicable for SMEs. [d] SSC exemption. [e] Payable in 3 instalments. [f] Refund available at 20% discount