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Design features of income-
based tax incentives
for R&D and innovation

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By Ana Cinta González Cabral, Silvia Appelt, Fernando Galindo Rueda, Tibor Hanappi
and Pierce O'Reilly

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Abstract

Tax incentives that provide preferential tax treatment to the incomes arising from research and development (R&D) and innovation activities, such as intellectual property regimes, have become widespread in recent years. This paper describes the key design features of tax incentives available in 49 member countries of the Inclusive Framework on BEPS, covering all OECD countries and EU countries. It outlines differences in the design of such incentives that may translate into differences in the tax benefits offered. The information collected and reported in this paper is a first step towards a more systematic comparison of tax support policies for R&D and Innovation.

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Executive summary

The tax system is a channel commonly used by governments to promote R&D and innovation, which are recognised contributors of productivity and economic growth. In 2019, 90% of OECD and 82% of European Union (EU) countries provided tax support to business expenditures on R&D and innovation, which represented 60% and 58% of total government support to business R&D in the OECD and EU, respectively.

In recent years, tax incentives that provide preferential tax treatment to the income from certain intangible assets via reduced tax rates or corporate income tax exemptions have become increasingly available. Income-based tax incentives provide support to the *outputs* of the innovation process, hence making relief conditional on success, whereas expenditure-based tax incentives target the inputs. Despite being increasingly used by governments as part of the policy-mix, comprehensive cross-country evidence on their design, generosity and uptake remains relatively scarce and existing evidence on their effectiveness is at best mixed.

Policymakers face significant challenges when designing tax policy to support R&D and innovation in a globally interconnected economy. In particular, corporate taxation has been found to influence not only the location of R&D investments but also that of the associated intellectual property (IP) asset, which can be strategically located in low-tax jurisdictions to obtain a tax advantage. Many governments seek to promote R&D and innovation in the jurisdiction while at the same time retaining and facilitating the commercialisation of the IP and the right to tax the associated income.

The implementation of the OECD/G20 Base Erosion and Profit Shifting Project's Action 5 minimum standard has led to significant design changes for income-based tax incentives, strengthening the 'nexus' or link between economic substance and tax support. In line with the nexus approach, most countries condition tax relief on the requirement that the taxpayer performs (or outsources to unrelated parties) the underlying R&D activity that led to the qualifying IP. Development requirements ensure that acquired IP can no longer benefit from relief unless further developed. The nexus ratio indicates the share of qualifying income that can be subject to relief based on R&D expenditures, though some flexibility is retained as to where R&D activity takes place. The compliance costs of the regimes together with the fact that in most countries only intangible assets that are formally protected through, for example, patents or copyrighted software may be entitled to a tax benefit, may have implications for the distribution of tax support across firm types.

This report describes the design features of income-based tax incentives for R&D and innovation available in 49 economies, including all OECD countries, all EU countries and 6 major economies. This report is conducted as part of a joint project between the OECD Centre for Tax Policy and Administration and the OECD Directorate for Science, Technology and Innovation, with financial support from the European Union's Horizon 2020 programme, to improve existing evidence on the availability, design, uptake and revenue forgone of income-based tax support.

- **Income-based tax incentives include IP regimes and dual category regimes.** IP regimes such as patent boxes provide relief to the income derived from certain IP assets. Dual category regimes, such as tax holidays for businesses, extend relief to other non-IP income of the firm if offered to businesses doing R&D or innovation related activities. Dual category regimes are broader in scope and the link to innovative outcomes may be more diffuse than under IP regimes. Dual category regimes represent 17% of the regimes in the OECD and 10% of the regimes in the EU.

- **In 2021, 22 out of 38 OECD countries and 17 out of 27 EU countries offered income-based tax support for R&D and innovation**, in most cases along with expenditure-based tax incentives such as R&D tax credits. Regime rates range from 0% to 23.8%. Full exemption is available in 6 countries covered.
- **On average, income-based tax incentives offer a reduced tax rate of 7.35%**, implying a 65% average reduction from the statutory tax rate (or applicable full tax rate if different, e.g. for capital gains).
- **Greater preferential tax rates can sometimes be accessed subject to specific conditions.** Some countries provide greater preferential tax treatment to certain categories of income. These include, e.g. capital gains subject to the reinvestment of the tax benefits; to income earned by larger investors or to income earned by large-scale investments.
- **Aside from the rate, the scope and a variety of other design features can affect the generosity of relief provided.**
 - Relief can be **targeted to certain activities or firms and may include investment size conditions**. Some regimes target support to certain activities or technology areas or businesses with a certain degree of R&D intensity. Only two countries limited relief to SMEs. However, in 6 out of 22 OECD countries and 5 out of 17 EU countries smaller taxpayers can access relief for a broader set of intangible assets with less stringent requirements for formal protection under certain circumstances. Some regimes require minimum levels of R&D investment, general investment or employment, reinforcing nexus with the jurisdiction.
 - Relief varies with the **type of qualifying assets**. Income-based tax incentives mostly target assets that benefit from formal protection, e.g. patents, copyrighted software, utility models or plant variety rights. IP assets that are informally protected, e.g. through trade secrets, are less commonly eligible for support.
 - Relief varies with the **types of qualifying income**. Almost all of the tax incentives covered provide relief to the income arising from the *commercialisation of IP* through licensing the IP to another firm (royalties) or the sale and transfer of the IP (income from the sale or capital gains). A smaller subset of countries, also provide relief to income stemming from a firm's own use of IP (embedded IP income). Beyond income arising from the commercialisation of the IP, income from the *protection of the IP* (e.g. damages or infringement) is eligible for relief in around 70% of OECD countries and EU countries where such regimes are in place.
 - Relief is subject to **development conditions**. Most countries implement the nexus approach to determine the share of qualifying IP income based on the R&D expenditures incurred by the taxpayer. Depending on whether the jurisdictional or entity approach is used, the types of acquisition strategies allowed vary and may be geographically limited.
 - Relief can be adjusted by **past expenses**. Some countries have provisions in place that require firms to adjust downward the amount of qualifying income to account for R&D expenses incurred in the past. Where such provisions are in place, income-based tax incentives are less generous than would otherwise be the case. The stringency of these requirements depends on their design.
 - Relief can be subject to **limitations** often based on quantitative thresholds. Ceilings on the absolute amounts of tax benefits or in relation to taxable income which effectively limit the extent of tax benefits firms can access are in place in 8 out of 22 OECD countries.

The information collected and reported in this paper is a first step towards a more systematic comparison of tax support policies. In particular, it can support research that deepens the understanding of how differences in the scope and design of these instruments may translate into differences in implied tax benefits that may affect the uptake and distribution of support across firm types. Such research could have important implications in understanding the dynamics of the innovation ecosystem.

1. Introduction

Innovation has long been recognised as a driver of long-term productivity and economic growth. Many governments use tax incentives, among other innovation policy tools, to encourage research and development (R&D) and innovation. A key case for government intervention is based on the argument that in the absence of government intervention, businesses would tend to underinvest in R&D and innovation activities relative to a level that is socially optimal for several reasons. These reasons include, inter alia, the risky and uncertain nature of R&D and the positive externalities R&D generates. Knowledge spillovers to the rest of the economy mean that firms cannot fully appropriate the benefits from their investment. At the same time, devising tax policy for R&D and innovation in an interconnected world is associated with considerable challenges. In particular, because income from intellectual property (IP) has been found to be mobile and can be sensitive to taxation (Griffith, Miller and O’Connell, 2014^[1]). Governments seek to put in place policies that promote and attract R&D and innovation in and into the jurisdiction while also providing the incentives to retain and commercialise the underlying IP (and hence the right to tax the income generated from the exploitation of the IP) in their jurisdiction.

In recent years, there has been a surge of tax incentives that target the *output* of the innovation process (Appelt, González Cabral and Hanappi, forthcoming^[2]). Income-based tax incentives for R&D and innovation (income-based tax incentives) provide for reduced taxation of the outcomes from R&D and innovation related activity, such as the profits arising from intangible assets (e.g. patents or other forms of IP). The benefit of these incentives is only received ex-post, i.e. once the innovation process is successful, as opposed to expenditure-based tax incentives, such as R&D tax credits, which are granted independent of the success of the investment. In 2021, 22 out of 38 OECD countries and 17 out of 27 EU countries offered income-based tax support compared to five OECD member states and three EU countries in 2000.

Despite its increasing uptake, at this stage, comprehensive and systematic evidence on the availability, design, expected generosity and actual cost (to governments) of income-based tax incentives across OECD and partner countries is relatively scarce (Appelt et al., 2016^[3]; Hall, 2019^[4]), especially on a time-series basis. This paper, which represents one in a set of three interconnected OECD working papers that outline the first findings from the OECD KNOWINTAX project¹, aims to improve the existing evidence on income-based tax incentives and provide a more complete picture of government efforts to support R&D and innovation. This paper describes income-based tax incentives available in 49 countries covering all OECD countries, all EU countries and 11 partner economies. The scope of this paper is broader than IP regimes, such as patent boxes, which provide preferential tax treatment to the income from certain intangible assets. It covers any form of income-based tax support that is granted to businesses performing R&D- or innovation-related activities such as tax holidays for innovative

¹ The OECD launched in 2020 the KNOWINTAX project as part of its EU-funded project on Mapping Business Innovation Support (MABIS). KNOWINTAX, carried out jointly by the Directorate of Science, Technology and Innovation (STI) and the Centre for Tax Policy and Administration (CTPA), aims to extend the existing OECD data collection and indicator infrastructure (<https://oe.cd/rdtax>) from expenditure-based to income-based tax incentives. Indicators for expenditure-based R&D tax incentives feature in the OECD R&D Tax Incentive database (OECD, 2021^[21]) and the Corporate Tax Statistics database (OECD, 2022^[28]), including the new indicator on effective tax rates for R&D (González Cabral, Appelt and Hanappi, 2021^[9]). KNOWINTAX includes the collection of information on the design and cost of income-based provisions and the integration of these schemes in the modelling of R&D tax subsidy rates and effective tax rates (ETRs) to support tax and innovation policy analysis.

firms, where the innovative firm status is granted upon the performance of a certain level or type of R&D or innovation activity.² These regimes, referred to hereafter as ‘dual category’, extend relief to income other than IP related income. Eligibility is determined based on the performance of R&D activities, which is typically proxied by an indicator of R&D activity. As the nature of IP and dual category regimes differs, particularly with respect to their scope, their economic implications for public finances and their impact on firms’ outcomes are likely to differ as well.

The design of income-based tax incentives has markedly changed since the introduction of Action 5 of the OECD/G20 Base Erosion and Profit Shifting (BEPS), but substantial heterogeneity remains which influences their generosity across jurisdictions (OECD, 2015^[5]).³ The BEPS Action 5 minimum standard seeks to ensure that tax benefits from preferential tax regimes for IP accrue only if there is substantive activity by the taxpayer. This has led to changes in the types of assets and the type and share of IP income that can benefit from relief. BEPS Action 5 has led to the alignment of certain design features. **Across countries, tax incentives still vary in the scope of IP assets to which they provide relief**, from formally to informally protected IP; in the types of income affected, from the income derived from the licensing and sale of IP to income from infringement; and in who they provide relief to. All of these sources of variation affect the breadth of the tax incentive. Beyond the reduction in the tax rate that already indicates the generosity of the regimes, there can also be differences in the tax base, mainly with respect to the treatment of past expenses.

This paper is accompanied by two other OECD studies. The first, translates key design differences in the calculation of tax benefits into cross-country comparable measures of the level of implied subsidy granted to firms in 2021 (González Cabral, Appelt and Hanappi, forthcoming^[6]), which provides a quantitative angle to this question. Beyond the generosity of regimes, it is important to study the uptake, forgone revenues and distributional consequences of these provisions. A second paper analyses the uptake and use of these provisions in terms of revenue forgone (Appelt, González Cabral and Hanappi, forthcoming^[21])

The paper is organised as follows. Section 2 covers the availability of income-based tax incentives for the countries covered in the study. Section 3 discusses the rationale for their introduction and outlines the role of BEPS Action 5 in shaping the design of regimes. Section 4 provides a description of relevant design features of income-based tax incentives and Section 5 concludes.

² Dual category regimes are captured in the study only if (a) IP income is not explicitly excluded; and (b) if relief is granted conditional on a business-level marker of R&D and innovation activity. Other general tax incentives fall out of the scope of this work (Celani, Dressler and Wermenlinger, 2022^[25]).

³ BEPS Action 5 on harmful tax practices is one of the fifteen actions and one of the four minimum standards that formed part of the final package delivered in 2015 by the OECD/G20 BEPS project to combat international tax avoidance. To ensure compliance with the standard, the Forum on Harmful Tax Practices (FHTP) carries out a peer review process. In order to be in scope of the FHTP peer review, regimes need to meet certain criteria (e.g. have a low effective tax rate, or artificial definition of the tax base) as outlined in OECD (OECD, 2015, pp. 61-62, par. 145-146^[5]). This implies that regimes that are in scope of the FHTP are only a subset of the regimes covered in this paper. The KNOWINTAX project is not part of any evaluation of regimes for FHTP purposes.

2. Availability of income-based tax incentives in the OECD area and beyond

Income-based tax incentives are currently widely available among OECD and EU countries, with most countries offering them as part of their innovation policy-mix. In 2021, 22 out of 38 OECD countries offered such incentives with this figure rising to 17 out of 27 EU countries (58% of OECD countries vs 63% of EU countries) (Table 1). The majority of OECD and EU countries, 20 out of 38 OECD countries and 15 out of 27 EU countries, use both expenditure- and income-based tax incentives as part of their innovation policy mix, combining measures that indirectly support the inputs and outputs of the innovation process.⁴ Only Luxembourg and Cyprus⁵ offer income-based tax support in isolation in 2021.

Most of the regimes are offered at the central level and take the form of IP regimes targeting support solely to the income arising from certain intangible assets. In 2021, the total number of regimes in place in the OECD comes up to 29 regimes and 19 regimes in the EU as certain countries offered several income-based tax incentives.⁶ In total, for all 49 countries covered in the study, 27 countries had income-based tax incentives in place in 2021 with the total number of regimes increasing to 37 (Figure 1). Out of the 37 income-based tax incentives in force in 2021, 32 are offered at the central government level rather than the regional or local level with the remaining five regimes offered at subnational government level (Figure 1).⁷ Dual category regimes that provide relief to other sources of income in addition to IP are less prominent in the sample of countries studied, representing about 30% of regimes in force in 2021. The figure is even lower in the EU, where dual category regimes represent only 10% of all regimes. Such regimes are available in China, the Czech Republic, Israel, Romania,

⁴ In the 2021-22 Budget, the Australian Government announced the introduction a Patent Box for medical and biotechnology innovations, to apply from 1 July 2022. This measure had not been enacted in law at the time of drafting this report.

⁵ Note by Türkiye:

The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

⁶ This count is based on the regimes listed in Table 2. The People's Republic of China (hereafter 'China') also offers a preferential tax provision for enterprises transferring technology which is not included explicitly included in this study due to the lack of complete information. France also offers a Young Innovative Enterprises regime to SMEs that is similarly not captured in this first report. Canada offers a 10-year tax holiday for new companies engaging in the commercialisation of IP generated at Universities or research centres in Québec until 31 March 2024. This regime is out of the scope of this paper since it does not directly relate to business R&D.

⁷ These regimes are offered in Canada, Spain and Switzerland. In Spain, incentives are available at both the central and subnational level, where the latter cover the incentives under the chartered regimes (“regímenes forales”) in the regions of Navarra and the Basque Country. In Canada, income-based tax incentives are available in the provinces of Québec and Saskatchewan, the latter is set to be abolished by 30 June 2024.

Thailand and in the United States.⁸ provides an overview of the different types of tax incentives that are in place at central or subnational level in the 49 countries covered by the KNOWINTAX project at this stage. From this point onwards, regimes will be referred to by their unique code for ease of exposition.

Table 1. Tax incentives for R&D and innovation, 2021

Economies within the scope of this study

| Type of tax support | OECD | Non-OECD EU | Other economies |
|--|--|----------------|---|
| (I) Income-based and expenditure-based | Belgium, Canada ⁽ⁱ⁾ , Czech Republic, France, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Lithuania, Netherlands, Poland, Portugal, Slovak Republic, Spain ⁽ⁱⁱ⁾ , Switzerland ⁽ⁱ⁾ , Türkiye, United Kingdom, United States | Malta, Romania | People's Republic of China, Thailand ⁽ⁱⁱⁱ⁾ |
| (II) Income-based only | Luxembourg | Cyprus | |
| (III) Expenditure-based only | Australia, Austria, Chile, Colombia, Germany, Denmark, Finland, Iceland, Mexico, Norway, New Zealand, Slovenia, Sweden | Croatia | Brazil, the Russian Federation ^(iv) , South Africa |
| None | Costa Rica, Estonia, Latvia | Bulgaria | Argentina ⁽ⁱⁱⁱ⁾ |

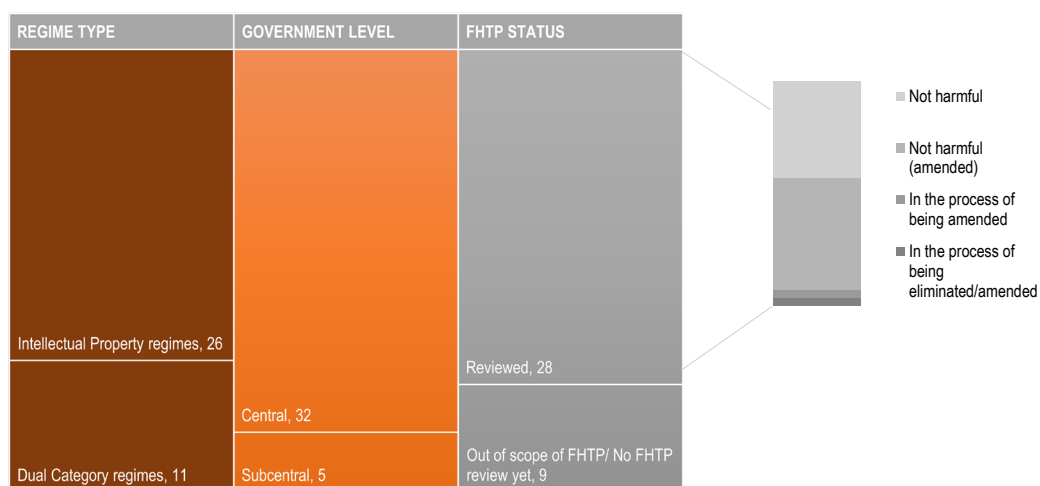
Note: ⁽ⁱ⁾ Incentive available at the subnational level. The subnational expenditure-based tax incentive in Switzerland is only available in certain cantons as its introduction was deemed optional (at the discretion of cantons) as part of the 2020 tax reform. The introduction of income-based tax support at the cantonal level was however compulsory for all cantons. ⁽ⁱⁱ⁾ Incentives available at the central and subnational level. ⁽ⁱⁱⁱ⁾ At the time of reporting, the retroactive extension of the R&D tax allowance in Thailand for 2021 is pending government approval. Since 2017, there have been no calls for the R&D tax incentive in Argentina. The new measures implementing the digital 'knowledge' economy regime (Disposición 11/2021 of 18 February 2021) are not captured in this report as such measures were not in place at the time of analysis. ^(iv) The report is based on data and information that pre-date the start of Russia's war of aggression against Ukraine in February 2022.. Country coverage refers to the 49 countries covered in the study, including OECD and EU countries and selected economies and refers to tax incentives available as of July 2021.

Source: OECD.

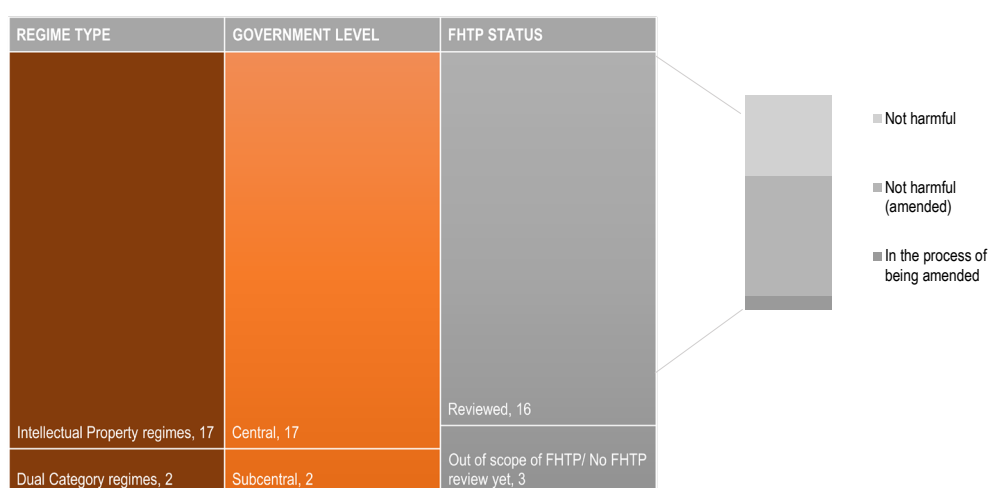
⁸ IP income in the United States regime is defined formulaically as income in excess of a fixed rate of return. The United States has indicated that it is reconsidering its FDI regime. The legislative process that may lead to changes in the US international tax regime remains ongoing at the time of drafting this report.

Figure 1. Income-based tax incentives in force in 2021: Key characteristics

Panel A: All economies



Panel B: EU countries



Note: FHTP status refers to the latest decisions published in April 2021 (OECD, 2021^[7]). These statistics refer to the regimes covered in Table 1.

Source: OECD based on KNOWINTAX surveys, FHTP peer review questionnaires and public sources.

Table 2. Regimes covered in the study, OECD and selected economies, 2021

| ID | Regime name | Introduction |
|--------|--|--------------|
| BEL | Deduction for innovation income | 2016 |
| CAN-Q | Déduction incitative pour la commercialisation des innovations (DICI) (Québec) | 2021 |
| CAN-S | Saskatchewan Commercial Innovation Incentive (SCII) | 2017 |
| CHE | IP box | 2020 |
| CHN1 | Reduced rate for high & new tech enterprises (HNTE) | 2008 |
| CHN2 | Tech-based SMEs (TSMEs) | 2017 |
| CYP | IP Box regime (new regime) | 2016 |
| CZE | Investment incentives for R&D centres | 2012 |
| ESP | Partial exemption for income from certain intangible assets (Federal regime) | 2004 |
| ESP-B | Partial exemption for income from certain intangible assets (Basque country) | 2008 |
| ESP-N | Partial exemption for income from certain intangible assets (Navarra) | 1997 |
| FRA | Reduced corporation tax rate on IP income | 1979 |
| GBR | Patent Box | 2013 |
| GRC | Tax patent incentives | 2018 |
| HUN | IP regime for royalties and capital gains | 2003 |
| IRL | Knowledge development box | 2016 |
| ISR1 | Preferred enterprise regime | 2011 |
| ISR1-S | Special Preferred enterprise regime | 2011 |
| ISR2 | Preferred technology enterprise regime | 2017 |
| ISR2-S | Special preferred technology enterprise regime | 2017 |
| ITA | Taxation of income from intangible assets | 2015 |
| JPN | Tax incentive for specified business in the National Strategic Zones | 2017 |
| KOR | Tax reduction for transfer or leases of technology | 2014 |
| LTU | IP taxation regime | 2018 |
| LUX | IP regime | 2018 |
| MLT | Patent Box regime | 2019 |
| NLD | Innovation box | 2007 |
| POL | IP box | 2019 |
| PRT | Partial exemption for income from certain intangible property | 2014 |
| ROU | Exemption for taxpayers engaged in R&D and innovation | 2017 |
| SVK | Patent Box | 2018 |
| THA1 | International business centre | 2019 |
| THA2 | Activity-based tax incentive | 2003 |
| THA3 | Merit-based tax incentive | 2015 |
| TUR1 | Technology development zones regime | 2001 |
| TUR2 | 5/B regime | 2015 |
| USA | Foreign derived intangible income (FDII) | 2018 |

Note: Table A.1 provides general information on the regimes covered. For a full list of regimes available over time see Appelt et al. (forthcoming^[2])

Source: 2020 and 2021 KNOWINTAX surveys, FHTP peer review questionnaires and public sources

3. Rationale for implementation and the impact of OECD BEPS Action 5

As reported in the survey, two reasons are often cited to support the introduction of income-based tax incentives: (i) *to promote and attract R&D and innovation activities - recognised drivers of productivity and economic growth*; (ii) *to retain and encourage the commercialisation of IP in the jurisdiction*. Government intervention to lower the cost of performing R&D is often justified, among other reasons, by the risky nature of R&D and the inability to fully appropriate the returns to R&D, which may lead to an underinvestment in R&D relative to a level that is socially optimal (Arrow, 1962^[8]). While it could be argued that income-based incentives increase the ex-ante incentive to invest in R&D by increasing the ex-post return to such investments through a reduction in the tax rate on future IP profits, this effect operates only very indirectly (Hall, 2019^[4]).⁹ The expectation of a reduction in the cost of performing R&D only holds if the firm expects to achieve a successful outcome from the investment, contrary to expenditure-based tax incentives where support is not conditioned on success (González Cabral, Appelt and Hanappi, 2021^[9]). Importantly, IP regimes only provide relief to certain intangible assets, i.e., innovations that are not protected or protected through non-qualifying assets would not give rise to tax benefits. Tax benefits may only be accessible to a subgroup of a jurisdiction's population of firms.

By introducing income-based tax incentives, governments seek to maintain a globally competitive environment for businesses to retain and encourage commercialisation of the underlying IP, hence retain the right to tax the income generated by the IP. Taxing intangible income in a global economy poses great challenges due to its mobile nature (OECD, 2015^[10]; Mooij, Klemm and Perry, 2021^[11]). The strategic location of intangible assets in low-tax jurisdictions has long been found to be one of the strategies by which multinational enterprises (MNEs) can obtain a tax advantage (Evers, Miller and Spengel, 2015^[12]; Griffith, Miller and O'Connell, 2014^[1]; Dischinger and Riedel, 2011^[13]). A reduced domestic tax rate on the income from certain intangible assets offers a way to reduce the MNE's incentives to shift intangibles to low-tax jurisdictions. Establishing reduced tax rates on mobile income such as IP may allow countries to sustain their ordinary rates for other less mobile bases (Keen and Konrad, 2013^[14]).

In recent years, the link between R&D activity and income qualifying from IP has been reinforced by the introduction of the BEPS Action 5 minimum standard in 2015, curtailing situations where assets could be relocated merely to benefit from preferential tax relief. BEPS Action 5 builds on the work of the FHTP, which commenced its work on harmful tax practices in 1998 based on the criteria set out by a report released in that same year (OECD, 1998^[15]). The BEPS Action 5 minimum standard introduced more stringent substantial activities requirements, commonly known as the nexus approach, for any preferential IP regime in the spirit of aligning taxation with substance and ensuring that taxable profits cannot be shifted away from where value is created.

⁹ Expenditure-based tax incentives target directly the expenditures the firm incurs and are independent of whether the investment is successful or not. Income-based tax provisions are only received by the firm upon being successful. The R&D and innovation process is by nature highly uncertain and there might be significant lags between the conception of the idea, the generation of the intangible and where applicable seeking protection for the asset, for instance in the form of a patent. The firm will face uncertainty and risks in all stages in the process. Given that, the case of income-based tax incentives reducing the cost of investing in R&D today is rather weak or in other words, the incentive is provided in a very indirect manner.

The nexus approach establishes a link between the R&D activity of the taxpayer and the income eligible for income-based relief. This has the effect of reducing access to preferential tax treatment through a tax optimising transfer. IP that has been acquired and that has not been developed by the taxpayer cannot be eligible for relief under nexus compliant regimes. The implementation of the nexus approach also means that certain types of intangible assets, e.g. marketing intangibles; and their associated income cannot benefit from relief as they do not arise directly from R&D activity. The changes introduced by BEPS Action 5 to the types of qualifying assets, qualifying income and on the calculation and implementation of the nexus ratio are summarised in Box 1 and have resulted in a greater alignment of certain design features across regimes. Still, some heterogeneity remains (Section 4.). While even the more recent studies in this area pre-date BEPS implementation, previous literature has found that incentives to transfer IP fade or disappear when regimes impose development conditions for existing or acquired patents to benefit from preferential relief (Alstadsaeter et al., 2015^[16]; Ciaramella, 2017^[17]; Gaessler, Hall and Harhoff, 2021^[18]).¹⁰

The implementation of Action 5 required regimes to be abolished or amended to become nexus compliant. Strict timelines were established to ensure the transition to nexus compliant regimes in a timely way. A transitional period was established for non-compliant regimes that allowed to taxpayers already benefitting from the regime to keep their entitlements until no later than the 30 June 2021 ('BEPS Action 5 transitional measures'). All members of the Inclusive Framework on BEPS committed to implementing the minimum standard and to participating in the associated peer review process. The FHTP monitors these regimes, and countries update the FHTP on any changes and legislative progress made with respect to their existing legislation. Out of the 37 regimes covered in this study, 28 have been reviewed by the FHTP and 93% of them are considered either not harmful or their harmful features have been amended as of April 2021.¹¹ The remaining regimes are considered out of scope or had not been reviewed as of April 2021 (Figure 1).¹² Regimes reviewed by the FHTP are therefore only a subset of the regimes covered in this study.

¹⁰ Appelt et al. (2016^[3]), Hall (2019^[4]) and Gaessler et al. (2021^[18]) discuss recent evidence on the effectiveness of IP regimes on R&D and innovation.

¹¹ The regime in Greece has been amended and is considered nexus compliant as of 1 January 2022. The latest FHTP decisions released in July 2022, mark this regime as not harmful (amended) (OECD, 2022^[27]). The regime in Italy has been repealed as of 21 October 2022 and relief will be provided instead through an expenditure-based tax incentive in the form of an R&D tax allowance. This regime is listed as abolished in the latest FHTP decisions with no transitional measures in place.

¹² Certain types of tax incentives may fall out of the scope of the FHTP if specific conditions are not met. For instance, tax incentives that are introduced to attract investment in plant, building and equipment would typically fall out of the scope of the FHTP. Likewise, for subnational regimes for which the combined effective tax rate at the subnational and national level would be sufficiently high, the regime would not meet the criteria of offering a low tax rate. In addition, a sub-national regime would be considered out of scope of the FHTP process unless the national government is ultimately responsible for the general design of the relevant regime, with limited discretion on the part of the sub-national government on the regime's introduction or key features, and the tax rate at the sub-national level represents a significant proportion of the combined tax rate (OECD, 2015, pp. pp. 61-62 par 145-146^[5]).

Box 1. Key design changes introduced by BEPS Action 5

Qualifying assets and qualifying income

Action 5 restricts IP assets that can qualify for tax benefits to (i) patents and other IP assets functionally equivalent to patents if they are legally protected and subject to similar approval and registration processes; (ii) copyrighted software and (iii) IP assets that share similar traits to patents but that do not fall in the previous two categories but that are certified in a transparent process by a competent government agency. Only taxpayers with less than EUR 50 million (or nearest amount in domestic currency) in global group-wide turnover and with no more than EUR 7.5 million in gross revenue from all IP assets on average in the last five years are eligible to apply for relief under this third category. Marketing intangibles such as trademarks and income derived from them can never qualify for relief. Overall income from IP assets should be limited to IP income. Embedded IP income may benefit if it can be separately calculated using, for instance, transfer pricing conventions. Qualifying income earned in a given year should always be defined net of associated ongoing IP expenses incurred in the same year. The regime should ensure that losses associated with the IP cannot be used against ordinary income.

Qualifying expenditures as a link to substance: The nexus ratio

The nexus ratio sets a proxy for the substantial activities undertaken by the taxpayer. The numerator equals qualifying expenditure (QE) which includes (a) expenditure directly incurred by the taxpayer that currently qualifies for relief under expenditure-based R&D tax incentives plus (b) the cost of outsourcing to unrelated parties. Interest payments, acquisition costs, building costs and any other costs not directly linked to a specific asset, do not enter the definition of qualifying expenditure. The denominator equals overall expenditures (OE), which is the numerator plus (c) acquisition costs and (d) costs of outsourcing to related parties. To allow some flexibility in the development mix of the asset, jurisdictions may allow taxpayers to apply a 30% uplift to qualifying expenditures, increasing qualifying expenditure but never to the extent that qualifying expenditure would be greater than the total amount of overall expenditure. The nexus ratio as a function of QE, OE and terms *a*, *b*, *c*, and *d* can be expressed as follows:

$$\text{Nexus ratio} = \frac{\text{Qualifying expenditure to develop the IP (QE)}}{\text{Overall expenditures to develop the IP (OE)}} = \frac{\text{Min}((a + b) * 1.3, \text{OE})}{a + b + c + d}$$

The nexus approach is additive in that both qualifying and overall expenditures represent expenditure incurred over the life of the IP asset. Expenditures for the purpose of the nexus ratio enter the calculation when they are incurred (independent of the accounting or tax treatment). In exceptional circumstances, the nexus ratio can be rebutted if the taxpayer demonstrates that the level of eligible income as calculated by the nexus ratio does not accurately reflect their contribution to R&D activity.

Track-and-trace system and transitional measures

The regime should contain a track and trace system that tracks expenditures, IP assets and income to ensure that the income receiving benefits did in fact arise from the expenditures that qualified for those benefits. As a transitional measure, countries could introduce rules that allowed taxpayers already benefiting from an existing regime to keep such entitlements until no later than 30 June 2021.

Source: OECD based on OECD (2015^[5])

4. Key design features

This section maps out the relevant design features of income-based tax incentives in 2021, i.e. it provides a description of IP regimes and dual category regimes.¹³ The extent of tax benefits provided by income-based tax incentives is influenced by two key factors (Figure 2). The first factor is the **scope of the regimes** determined by the definition of the eligible taxpayer, by the types of IP assets and income flows that give rise to preferential tax treatment. These three design features influence how targeted income-based tax relief is. Qualifying IP assets and associated relief in turn are affected by the existence of development conditions for the IP to access preferential tax treatment. The broader the scope of the regime, the more encompassing a tax provision is, all else equal. The second factor is the **calculation of tax benefits**, which is heavily influenced by the design of the tax instrument. The extent of reduction from the full rate¹⁴ provides insights into the generosity of the regime but an accurate assessment of the level of implied subsidy should consider the provisions affecting the calculation of the tax base, in particular the treatment of R&D and related expenses incurred in the past. Differences in the design of the tax instrument will lead to variation across countries in the level of tax benefits that taxpayers can obtain for a given qualifying IP asset.

Figure 2. Key characteristics of income-based tax incentives

| | | |
|---|--|--|
| Factors influencing the scope of the regime | Eligible taxpayer and eligibility conditions | <ul style="list-style-type: none"> Firm size (SMEs/Large firms), type of R&D or innovation activity, minimum level of R&D investment, other non-R&D investment requirements, e.g. employment |
| | Qualifying assets and IP development conditions | <ul style="list-style-type: none"> Type of IP that qualifies, including formal and informal protection Requirements to develop or have developed IP Location of R&D, IP registration and status of protection |
| | Qualifying income | <ul style="list-style-type: none"> Types of income flows that qualify, e.g. commercialisation or protection of IP, other non-IP income (dual regimes) |
| Factors influencing the calculation of tax benefits | Preferential tax rates | <ul style="list-style-type: none"> Regime rate Number of years for which preferential tax treatment is available |
| | Definition of the tax base | <ul style="list-style-type: none"> Treatment of ongoing expenses Treatment of past expenses Treatment of IP losses Development conditions (nexus ratio) |
| | Limitations to tax benefits and treatment of unused benefits | <ul style="list-style-type: none"> Ceilings or caps on income or tax benefits, time limits Carry-over provisions or refundability of unused tax benefits |

Source: OECD.

¹³ The design features captured in this note stem from three different sources. The first is FHTP peer review questionnaires which contain information submitted by jurisdictions to the FHTP for the evaluation of compliance with the standard. The second is the KNOWINTAX 2021 survey that sought to update and complement the information from FHTP peer review questionnaires for the purposes of modelling. The third when information from the previous sources was incomplete or lacking, data was complemented with public sources. The latter is the case for the regimes in China, Canada (survey response was complemented where data was missing for the regimes in Québec and Saskatchewan), Romania and Thailand.

¹⁴ The 'full rate' is in most cases the statutory tax rate. In certain jurisdictions, a different (typically lower) rate applies to capital gains. The term 'full rate' is used as an umbrella term to capture the applicable rate in the absence of support.

This section is organised as follows. It starts by analysing factors affecting the scope of the incentives by providing an overview of eligible taxpayers, the definitions of qualifying assets and associated development conditions and of qualifying income (Sections 4.1.-4.3.). It then turns to discuss the elements that affect the calculation of tax benefits including the preferential tax rates and the calculation of the tax base (Section 4.4 and 4.5.), and any existing limitations (Section 4.6.).

4.1. Eligible taxpayer and eligibility conditions

Income-based tax incentives are typically available to taxpayers liable for corporate income tax in a jurisdiction, with some countries extending relief to unincorporated businesses.¹⁵ The eligible taxpayer needs to earn qualifying income from qualifying IP assets, with most countries requiring that the taxpayer meets certain development conditions to be eligible for relief (Section 4.2.). Taxpayers liable to CIT include domestic taxpayers, permanent establishments (PE) of foreign companies and foreign PEs of domestic residents liable to tax in the jurisdiction. In France, Greece, Italy, Malta, Poland, Switzerland and Türkiye, tax relief is also accessible to unincorporated businesses.

In most countries, tax incentives are accessible to firms of all sizes, but small taxpayers may be able to benefit from an enhanced tax treatment. Some countries, for instance, limit income-based tax incentives by firm size. In Korea, the preferential tax treatment for leases of technology is restricted to small and medium size enterprises (SMEs) and is only extended to middle standing companies in the cases of transfer of technology between domestic firms. China offers a dual regime targeted to SMEs that conduct technology-based activities (TSMEs). While very few regimes are exclusively available to SMEs, smaller taxpayers may be granted relief for a larger set of intangible assets than larger taxpayers in certain countries (see Section 4.2.). In some instances, the tax treatment can instead be more advantageous to large firms in the form of reduced tax rates (see Section 4.4.).

While less common, some regimes target relief to taxpayers performing certain types of R&D or innovation related activities or that operate in certain specific technology areas. In some instances, income-based tax relief is targeted only to businesses that perform substantial R&D activity or activity in certain areas of interest to the government (Table 3). One of the conditions for China's High and New Technology enterprises (HNTE) to enjoy tax incentives is that their core technologies fall into the high-tech field supported by the state, which is updated to cover new technologies (e.g. in 2016 to incorporate cloud computing). Similarly, Japan's regime offers a reduced tax rate to businesses that perform R&D activity in the areas of medical technology, medical care and drugs; advanced technology for the primary sector and R&D on technologies related to the Internet of things and the autonomous operation of objects using information.¹⁶ In the Czech Republic under the Technology Centres regime the taxpayer is required to engage in activities linked to R&D and innovation such as the performance of applied research, development and innovation of high-tech or advanced products and

¹⁵ In some cases, anti-abuse provisions are in place. In Italy, non-resident taxpayers with a permanent establishment are eligible if they are resident in a jurisdiction with which Italy has an effective tax information exchange agreement.

¹⁶ In Japan, the reduced tax rate is offered to firms that carry out certain specified activities approved by the Cabinet Office Ordinance mentioned in Article 27-3 of the National Strategic Special Zones Act, among which are R&D businesses as specified above, whose headquarter is located in one of the designated National Strategic Zones.

processes, including innovation in software.¹⁷ Thailand's activity and merit-based regime grants relief to taxpayers performing one of four activities: (i) basic research; (ii) applied research; (iii) prototype and production process testing; (iv) demonstration development (i.e. pilot development to test a production process at the industrial level). While such conditions are most prevalent among dual category regimes, they are also present for IP regimes such as for Israel's (special) preferred technology enterprises regime.

Some countries use proxies or business-level markers of innovation to target income-based tax relief to R&D businesses with substantial R&D activity. These markers can include a ratio of business R&D expense to total expenses or of R&D revenues to total revenues. China's High and New Technology enterprises need to meet relevant conditions to qualify for relief. For example, the ratio of total R&D expenses to total sales revenue in the previous three accounting years is required to reach a certain level. Likewise, it requires that the ratio of income from high-tech products or services to total income is no less than 60% in a given period and that R&D and innovation personnel represent at least 10% of employees.¹⁸ Among the criteria that are evaluated towards granting TSME status are R&D intensity, ownership of IP products by the firm and the number of scientific and technical personnel. In Israel, firms accessing the preferred or special preferred technology enterprise regime need to have an average of at least 7% R&D expenses to sales ratio in the three preceding years (or expenses larger than ILS 75 million per year) and meet minimum requirements on the share of employees or investment in the jurisdiction.¹⁹ The special preferred status is conferred only to firms belonging to a group with revenue above ISL 10 billion and entails more generous tax provisions (Section 4.4.).

¹⁷ In the Czech Republic, depending on the size of the firm and the type of the investment (strategic or not), the benefits include tax benefits and grants. Incentives other than through the tax system are not accounted for in this paper. The investment incentive may be granted to investment projects implemented in (i) manufacturing centres; (ii) technology centres; (iii) strategic services centres. While investment in intangible assets may occur also in manufacturing centres and associated income from IP may qualify for relief, this paper covers incentives targeted to foster R&D and innovation. In this paper, the focus is placed on the technology centre regime which is focused on R&D and innovation including software. The strategic services centres may take the form of a software development centre, focusing on the development of new, or the innovation of existing software is currently not covered.

¹⁸ The Technology-based SME scheme is targeted to SMEs with scientific and technological personnel who are involved in research and development activities and obtains patents for creating high-tech products or services. Among the criteria that are evaluated towards granting TSME status are R&D intensity, IP products owned by the firm and the scientific and technical personnel.

¹⁹ Alternatively, firms can also qualify if they are approved by the Innovation Authority as an Innovation Advancing Enterprise, have total income of the MNE group in the relevant tax year below ILS 10 billion and are considered a competitive enterprise that exports at least 25% of sales. Note that Israel's preferred enterprise regimes (ISR1 and ISR1-S) may also be used by businesses engaging in activities other than R&D.

Table 3. Targeting of tax incentives to R&D performing businesses

Only regimes with R&D or innovation-related targeting criteria at the taxpayer level

| | Definition of eligible taxpayer based on R&D or innovation-related eligibility criteria (taxpayer level, not IP specific) | | | Investment requirements for eligibility | | (F) Other requirements (e.g. location, export intensity) |
|--------|--|--|--|--|--|--|
| | (A) Activity-defined: The business performs R&D (non-specific) | (B) Activity-defined: The business performs R&D in certain technology area or sectors | (C) R&D or innovation-related marker: The business meets a certain proxy for business R&D intensity or innovation intensity | (D) Requirements on R&D or innovation related investment size | (E) Requirements on other non-R&D investments (capital investments, new employment) | |
| CHN1 | | x | x | | | |
| CHN2 | | x | x | | | |
| CZE | | x | | x | x | |
| ISR1 | | x | | | | x |
| ISR1-S | | x | | x | x | x |
| ISR2 | | | x | x | x | x |
| ISR2-S | | | x | x | x | x |
| JPN | | x | | | | |
| ROU | x | | | | | |
| THA1 | x | | | x | x | |
| THA2 | x | | | x | x | |
| THA3 | x | | | x | x | |

Note: This table only covers income-based tax incentives with eligibility conditions at the taxpayer level, which can be combined with IP-specific development conditions (Table A.3). Most regimes apply to all businesses provided that those have qualifying income from a qualifying asset and establish typically IP-specific development conditions, see Table A.3. Columns A-C of this table refer to the criteria used among these regimes to target support to R&D businesses. Three categories are highlighted. In column A and B, tax support is targeted based on the performance of R&D activity (activity-defined). The difference between the two is that B targets support to R&D activity in certain sectors or defines the type of R&D activity supported, e.g. basic research, prototype development, etc. Column C captures those regimes that rely on proxies of R&D or innovation intensity to target support to the taxpayers with a substantive level of R&D and innovation. Columns D-E capture whether there are certain R&D (D) or non-R&D (E) investment requirements the taxpayer needs to meet, such as a minimum level of R&D investment or a certain degree of new employment. Column F lists all other requirements such as whether support needs to occur in certain locations or there are requirements on for example export intensity.

Source: 2021 KNOWINTAX survey.

Aside from R&D, certain regimes may also impose further requirements for a taxpayer to qualify, mainly related to the creation of jobs or to attaining a certain level of investment (intangible or tangible assets). The regime in the Czech Republic varies the requirements on investment in long-term assets and employees with the size of the taxpayer. Israel requires a certain level of investment in R&D or other productive assets or in employment for firms to access the benefits linked to the preferred and special preferred enterprise status and requires exports to amount to at least 25% of companies' annual sales. In Thailand under the activity-based and merit-based regimes, projects need to create new employment for R&D personnel equal to a certain amount per year in addition to the performance of certain R&D or

innovation related activities.²⁰ Certain regimes also provide further preferential tax treatment to investment in certain locations. In Israel, investments occurring within the Development Region A can benefit from a 7% regime rate, which is 5 percentage points lower than investments taking place elsewhere in the case of the preferred technology enterprise regime. Similar provisions exist for all other regimes in Israel.

Some jurisdictions require taxpayers to submit a formal application or to hold specific documentation to access the benefits of the regime. In China, the Czech Republic, Greece, Israel, Japan and Malta, taxpayers are required to submit a formal application for assessment under the relevant authorities to be able to access the benefits from the regime. In the Netherlands, taxpayers are required to have been issued an R&D statement by the Dutch government office for R&D work linked to the IP asset. This statement is obtained through application to the expenditure-based R&D tax scheme, i.e. the payroll withholding tax credit (WBSO). For small taxpayers, access is conditional only upon receiving this R&D statement. In addition to this statement, larger taxpayers need to provide further documentation. A pre-ruling may be required under specific circumstances, e.g. in Belgium where firms request a deviation from the standard application of the nexus ratio (Box 1); or in Italy for the determination of embedded income prior to 2019. Such pre-rulings may be requested by a taxpayer in some countries, such as in Luxembourg or Spain. In the rest of cases, the burden of proof rests with the taxpayer who is required to keep the necessary records to sustain the claims made under the regime. This is particularly the case where ‘track-and-trace’ mechanisms are in place requiring taxpayers to be able to ‘track’ associated expenditures and ‘trace’ them back to the relevant IP income and IP assets, on an asset by asset basis or by family of assets (Box 1).

4.2. Qualifying assets and development conditions

4.2.1. Qualifying asset types

Income-based tax incentives grant preferential tax treatment to a variety of IP assets being patents or similar rights, including those that extend the period of protection, and copyrighted software among the most common categories. Figure 3 provides summary statistics for all 37 regimes covered, with Table A.1 providing a disaggregation by jurisdiction and regime. All regimes in the study provide relief to patents, and most jurisdictions extend eligibility to IP assets similar to patents. Out of the 29 regimes that explicitly list qualifying IP, 21 provide relief to utility models or short-term patents, which typically benefit from a shorter duration of protection than patents, lower fees and less stringent conditions on the inventive step (WIPO, 2004^[19]). Supplementary Protection Certificates (SPCs), which extend the period of effective protection of the patent on new medical products, are eligible in 18 out of the 29 regimes that explicitly list qualifying assets.²¹ Plant variety or plant breeder’s rights, which are a form of IP right granted to the breeder of a new plant variety, are qualifying assets in 20 out of 29 regimes. Aside from patents and similar rights, copyrighted software is also found to be explicitly eligible for relief in 25 out of 29 regimes covered.

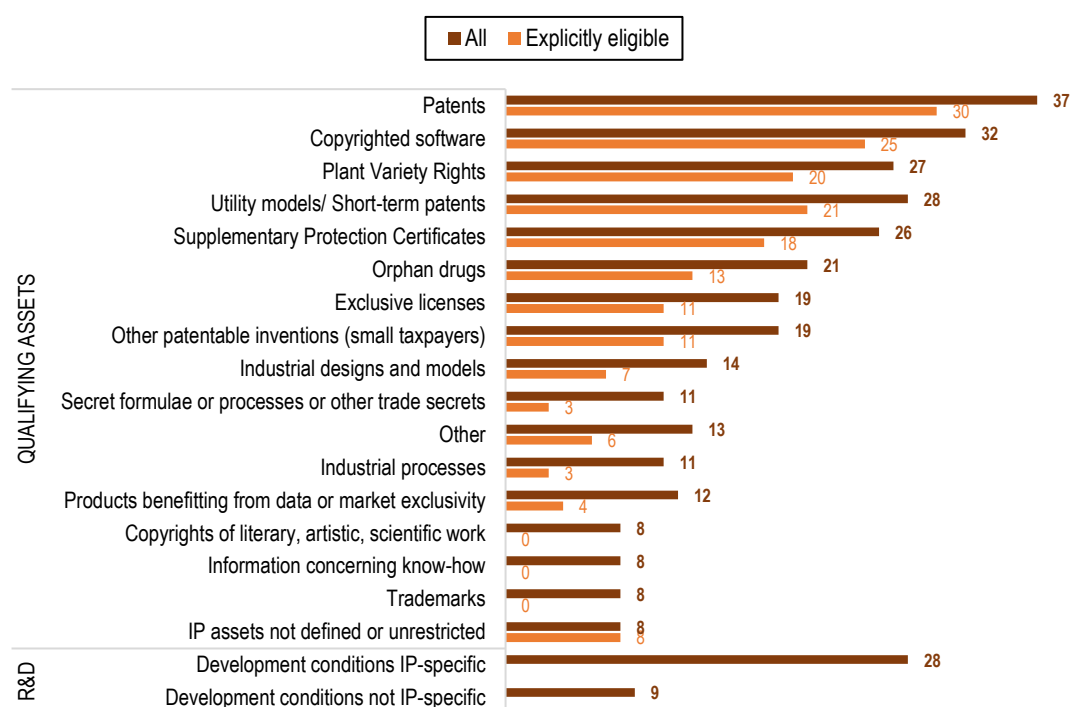
Though less commonly available, relief is also provided to other categories of IP, where a period of protection is conferred, such as orphan drugs or trade secrets. Orphan drug

²⁰ These substance-related features, while less common for R&D and innovation incentives among the countries studied, are very common under investment incentives observed in developing countries as covered by OECD Investment Tax Incentives database (Celani, Dressler and Wermenlinger, 2022^[25]).

²¹ SPCs aim to compensate for the time between the time of filing of the patent application for the new medicinal product and the reception of the authorisation to be placed in the market.

designations²² that provide a period of marketing exclusivity to developers of orphan drugs are explicitly listed as qualifying assets in 13 out of 29 of the regimes covered; while only four regimes consider products benefitting from data and market exclusivity protection as qualifying assets. Data and marketing exclusivity are a form of right with respect to medicinal products that confer the innovator exclusive rights to the results and commercialisation of its innovation.²³ Other assets that qualify less frequently are industrial designs and models (7 regimes), industrial processes and secret formulae or processes or trade secrets (3 regimes).²⁴

Figure 3. Qualifying IP assets and IP-specific development conditions, 2021



Note: 'All' in the chart refers to the total number of regimes for which the IP asset listed may be eligible for relief either explicitly, by means of a positive list in the legislation ('explicitly eligible') or implicitly by not being specifically excluded from eligibility. Other qualifying assets includes topographies, protected data. See Table A.2 for details. In the development condition section of the chart, regimes are divided into those that offer IP or non-IP specific development conditions. See Table A.3 for details.

Source: 2021 KNOWINTAX survey.

²² Orphan drugs refer to medicinal products that treat rare diseases or conditions. In the absence of support, the sale of these drugs may not generate sufficient income to justify the investment.

²³ More specifically, data exclusivity refers to the period in which the data and information provided by the innovator to the regulatory authority to obtain marketing authorisation for a reference product including information on pre-clinical tests or clinical trials, remains confidential and cannot be used by other firms to obtain future regulatory approval; while market exclusivity refers to the period in which the recipient of the first regulatory approval has exclusive rights to bring the product to the market. These are often understood as a way of creating stronger incentives for the innovator by preventing or delaying the entry of generic competitors (Clift, 2007^[26]).

²⁴ Note that for assets that are compliant with the BEPS Action 5 minimum standard they should be legally protected or liable for legal protection. This requirement is relaxed for small taxpayers (category III assets) for which certification is only necessary (Box 1).

Certain countries provide relief to small taxpayers for an extended category of IP assets with less stringent criteria on the protection of the asset for the asset to be qualifying.

The regimes in Cyprus, France, Israel, Ireland, Korea, Malta, the Netherlands and Türkiye provide tax relief for smaller taxpayers for inventions that share similar traits to patents or copyrighted software and that are certified by a competent government authority. This category of IP assets falls within the third category of assets defined in the BEPS Action 5 minimum standard (Box 1) and they are not required to be liable for legal protection in order to qualify for tax relief under the IP regime.

Across jurisdictions, the scope of qualifying assets varies from narrowly-defined regimes to regimes providing relief to a broad spectrum of IP, covering formal and informal forms of protection.

A comparison across the columns of Table A.2 provides insights into the extent of variation in the scope of qualifying assets eligible under the observed regimes. Relief can be targeted to a strict set of IP assets as is the case in Portugal (patents, SPCs and industrial designs and models) or the Slovak Republic (patents, SPCs, copyrighted software and plant variety rights). Other countries, such as the Netherlands and Italy, provide for a wider coverage of IP.

In certain cases, the legislation may not provide an exhaustive list of qualifying assets, making certain income categories implicitly eligible.

While the regimes in the Czech Republic, Japan, Romania and Thailand provide preferential tax relief to businesses conditional on the performance of R&D and innovation activities as described in Section 4.1., the categories of qualifying IP assets are not explicitly listed in the legislation. In the United States, the FDII deduction applies to intangible property (see Section 4.3.), with the exception of copyrighted articles.²⁵ While there is no exhaustive list of IP assets that are eligible, there are also no other exceptions. Under China's TSME regime, the availability of IP and the categories of IP are part of the scoring system that determines eligibility for the TSME scheme but relief is not restricted to certain IP assets. Similarly, in order to qualify for HNTE status the firm must hold ownership of the IP related to its core technology, which can be protected through one of several different forms of IP.²⁶ Nevertheless, qualifying income may arise from a variety of different IP assets. Regimes that do not provide an explicit list of qualifying IP income may provide implicit relief to a variety of different IP assets are accounted for in the totals of Figure 3.²⁷

4.2.2. IP development conditions and the location of R&D activity

In line with the nexus approach, most countries condition tax relief on the requirement that the taxpayer performs the underlying R&D activity that led to the qualifying IP.

For regimes following the BEPS Action 5 minimum standard, the link between R&D performance and tax benefits is implemented through the nexus ratio, which acts as a proxy for substantive research-related activities of the taxpayer (Box 1 and Table B.1). Some countries may also establish additional development conditions, some of which existed prior to the introduction of

²⁵ A copyrighted article includes a copy of a computer program from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. In principle, any qualifying income from IP would be eligible for relief.

²⁶ Upon qualifying as a HNTE, the reduced tax rate applies to all income from the firm, which may include other forms of IP. Details of the different forms of protection eligible for relief in China are provided in Table A.2.

²⁷ Assets identified as being potentially eligible in the absence of explicit lists are identified in Table A.2.

BEPS Action 5 (Evers, Miller and Spengel, 2015^[12]).²⁸ Development conditions at the IP level are in place in 28 out of the 37 regimes covered in this study (Figure 1). Such conditions may be in addition to or in lieu of R&D or innovation eligibility criteria at the taxpayer level as outlined in Table 3.

All regimes provide relief for IP that is self-developed with most countries extending relief to IP that results from outsourcing of R&D costs to unrelated parties. Expenditures from both strategies to acquire IP are treated as ‘qualifying expenditure’ in the definition of the BEPS Action 5 nexus ratio (Box 1). In line with nexus requirements, acquired IP and IP resulting from outsourcing R&D to related parties need to be subject to further development by the taxpayer to benefit from relief (Table A.3). Acquisition costs or costs of outsourcing to related parties is included in the denominator of the nexus ratio and are considered part of ‘overall expenditure’ (Box 1). In such cases, the taxpayer can only benefit from tax relief on the share of income that is proportional to its contribution to the R&D that led to the IP asset, i.e. the further development undertaken by the taxpayer. In most jurisdictions, an uplift of 30% of qualifying expenditures applies to provide some coverage for non-qualifying expenditures (Section 4.5.4.). Where regimes do not establish specific development conditions in relation to a specific IP asset, qualifying income from IP assets generated through different acquisition strategies may be in principle eligible, provided all other eligibility conditions are met.^{29,30}

Some jurisdictions may adopt alternative definitions of qualifying expenditure, which can in some cases be conditional on the location of R&D activity. In the Slovak Republic, IP is required to be fully developed in-house to qualify for relief, establishing a stricter definition of qualifying expenditures than in the BEPS Action 5 report. Outsourcing costs to related or unrelated parties do not constitute qualifying expenditures for the regime and, do not benefit from any relief. In other cases, jurisdictions allow a broader definition of qualifying expenditure that includes related party outsourcing or acquisitions as long as the R&D takes place in the jurisdiction. The BEPS Action 5 report allows for this ‘jurisdictional approach’ as long as it is applied by jurisdictions that are not Members of the EU (OECD, 2015^[5]). Among the regimes covered, the jurisdictional approach is in place in Korea, Israel, Switzerland and Türkiye. The jurisdictional approach cannot be pursued by EU countries as establishing restrictions to R&D activities being performed in other member states would be contrary to the freedom of establishment. The BEPS Action 5 report therefore allows EU countries to pursue the ‘entity approach’, which limits qualifying expenditure to expenditures made by the taxpayer or subcontracted to unrelated parties as described in the previous paragraph.

While the nexus ratio establishes a link between the taxpayer’s R&D expenditure and its IP profits, R&D activities are seldom required to occur solely in the jurisdiction where the taxpayer is located. Most of the regimes do not establish geographical restrictions to where the taxpayer performs R&D activity or to which jurisdictions it can outsource R&D costs, with some exceptions. By nature of the approach, regimes using the jurisdictional

²⁸ For example, the United Kingdom requires that the taxpayer meets the development test, i.e., it carries out substantial activities in the development of the IP or product incorporating the invention and, the ‘active ownership condition’ if part of a group, which requires the taxpayer to actively manage the IP to benefit from the relief.

²⁹ These eligibility conditions are marked with brackets in Table A.3.

³⁰ For China’s HNT regime the taxpayer is required to have the ownership of the core IP rights of the firm through self-development, merge and acquisition or donation and should continuously conduct R&D. Upon meeting these criteria other IP can qualify that do not necessarily need to have been developed by the firm.

approach — Korea, Switzerland and Türkiye — do not allow the R&D activity conducted by the taxpayer itself outside the jurisdiction as a qualifying expense. The same applies for outsourcing to unrelated parties for Korea and Türkiye, while subcontracting to unrelated parties worldwide is possible for the Swiss regime. For regimes using the entity approach, the taxpayer may also perform R&D itself outside the jurisdiction through a PE. In most cases there is no restriction as to where the PE sits, i.e. R&D can occur in any jurisdiction. For example, in Belgium, the taxpayer can perform R&D outside of Belgium as long as the associated income arises in the taxable income of the entity in Belgium. Some exceptions exist. For example, Ireland and Luxembourg require the PE to be in the European Economic Area (EEA).³¹

Most regimes allow the taxpayer to outsource R&D costs to unrelated parties worldwide, allowing access to global innovation networks. With the exception of the regimes in Korea and Türkiye, no geographical restrictions are imposed on outsourcing to unrelated parties, i.e. firms can subcontract R&D to unrelated parties located anywhere in the world. Given the flexibility in the location of R&D activity, in most countries, there is no minimum level of R&D that needs to occur in the jurisdiction in order for businesses to qualify for relief. However, the case where all R&D that leads to the IP asset occurs outside of the jurisdiction through outsourcing R&D costs, might be considered a boundary case, i.e., most taxpayers may use a combination of self-development and outsourcing. Some regimes require a certain level of substance to occur in the jurisdiction (Section 4.1.), e.g. China's HNTE regime requires that at least 60% of total R&D expenses of the firm take place in China.

4.2.3. Application, registration and the location of IP

In most countries, qualifying IP includes IP granted by foreign IP offices, including international bodies, such as the European Patent Office. To define eligibility and the requirements for protection to be granted, some countries rely on the respective foreign laws, international laws and international conventions (e.g. EU laws, Patent Cooperation Treaties). This is the case for both regimes available in Canada at the provincial level, France, Greece, Italy, Lithuania, Malta, the Slovak Republic and Switzerland. Ireland and the United Kingdom provide a specific list of foreign IP offices, including the European Patent Office, from which patents would be recognised and considered for eligibility under the national IP regime. Ireland, however, offers the possibility for taxpayers to present patents that were granted following a substantive examination for novelty and inventive step from other authorities if the taxpayer is in a position to provide evidence of such examination upon request from the tax authority. Domestic registration of the IP asset is not typically required to benefit from relief, with certain exceptions. For the Cypriot regime, it is required that Cyprus be the designated office for European Patent applications and Greece requires the IP asset to be registered in Greece. Türkiye and Korea also require the asset to be granted and registered in the jurisdiction.

As the period between the application for protection of a given IP asset and when such protection is granted may be significant, certain countries allow profits to qualify for relief from the date of the application subject to certain conditions. This is the case in 17 of the regimes covered in the study (Table A.3). Jurisdictions differ as to when firms can start

³¹ Ireland allows for the taxpayer to incur in-house R&D outside of Ireland as long as it is within the European Economic Area (EEA) and no tax deduction is granted in the other state. In Luxembourg, the R&D activity must be carried out through a PE in another EEA state with the PE being operational at the moment the income is derived from the qualifying IP and as long as it does not benefit from a similar IP regime in the State of establishment. Likewise, R&D expenditures must be attributed to the resident taxpayer on the basis of the tax treaty between the other EEA state and Luxembourg. The existence of such PE carrying out R&D activity must be notified in the annual tax return.

receiving these benefits. In the majority of cases, firms can access the benefits from the moment of the application. In this case, a claw-back clause is in place to ensure that the firm returns any benefits (unduly) received, plus any interest or penalties in the event that it is eventually not granted protection. Lithuania, the Netherlands, the Slovak Republic and Malta follow this approach. In the United Kingdom, while firms are eligible for the Patent Box from the moment of application, relief is only received from the moment of the grant. Ireland leaves the choice of when to start receiving benefits from its Knowledge Development Box (KDB) to the firm. Firms can choose between claiming the KDB from the date of the application, with the respective clawback provisions or to claim it retrospectively once the patent is granted.³²

In most countries, having the economic ownership of the IP is sufficient to qualify for relief and full ownership is not typically required. Taxpayers may wish to decouple legal from economic ownership, for example if they centralise the legal ownership of the IP in a particular group company. Not requiring full ownership allows for recognition that in cases where the IP has been developed through joint ventures or cost contribution arrangements, the taxpayer is still eligible for relief in respect of the asset developed even if the legal ownership may only rest with one of the parties. Among the countries studied, the only three cases where full ownership (legal and economic) is required from the taxpayer are Korea and Türkiye. As discussed in Section 4.2.2. in cases where only having an economic right to the income is sufficient to qualify, up to three different locations may be involved in the development of an IP asset: the location of R&D activity, the location of legal ownership of the IP, and the location of the economic ownership of the IP giving rights to the income.

4.3. Qualifying income

Most regimes provide relatively generous coverage to the income related to or derived from the commercialisation of IP. This includes licensing, sale and IP income embedded in goods and services. In general, a firm can proceed with the commercialisation of its IP, generating revenue and value, in several ways.

1. through licensing, i.e. giving a right to use the IP;
2. through IP assignments (e.g. transfer and sale);
3. Through internal exploitation by the IP owner for its own production activity (European IP Helpdesk, 2019_[20]).³³

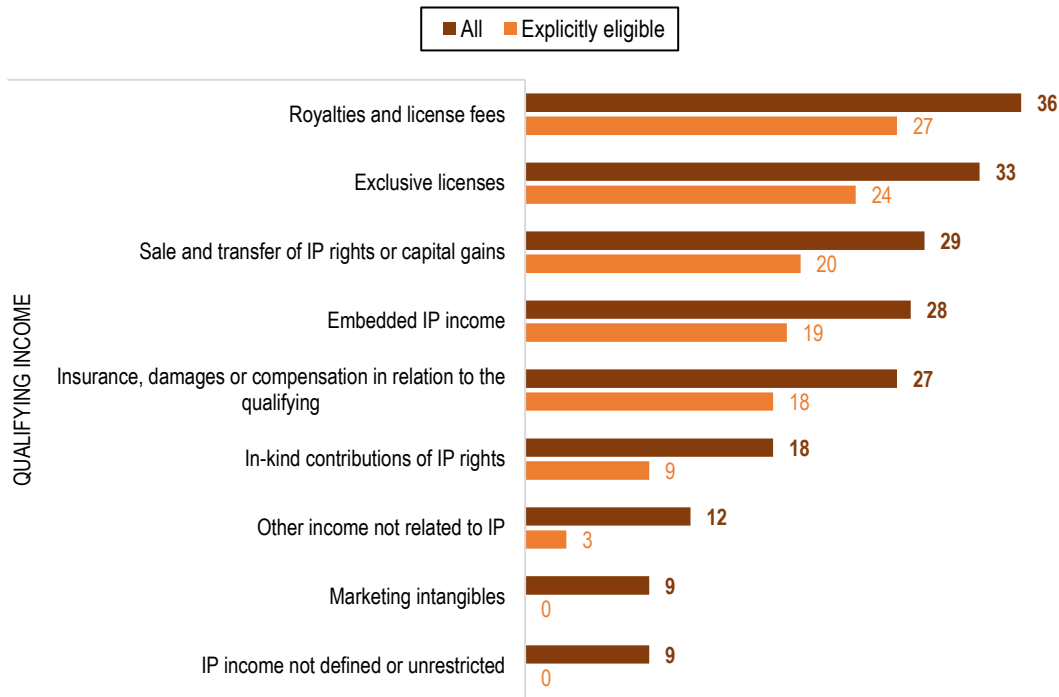
With the exception of Greece, all regimes provide relief in respect of royalties or license fees (category 1, in the list above) including the income from exclusive licenses as full ownership of the IP is not typically required for eligibility (Figure 4). All countries except for Greece, Israel (preferred and special preferred enterprise regime), Ireland, the Slovak Republic, Spain (Basque country) and Thailand (IBC) offer tax relief on income from the sale or transfer of IP

³² If relief is claimed and the patent is refused, firms must amend affected tax returns and pay out any remaining interest. If a retrospective claim is made, the firm would have had to make a protective claim each year in which they would have been able to claim the KDB if the patent is eventually granted.

³³ An IP assignment is a permanent transfer of ownership of an IP right (patent, trademark or copyright) from the transferring party (assignor) to a receiving party (assignee). License agreements are contracts by which a holder of IP (licensor) grants permission to use the IP, but not the ownership, to a third party (licensee) under the conditions explicit in the contract. Exclusive licenses are a particular case whereby the licensee has exclusive rights to the use of the IP asset preventing other firms from using the IP for the conditions included in the licensing agreement. IP rights can also be contributed in kind to the capital of other firms, e.g. subsidiaries. Contributions in-kind can be made to increase the registered capital of a firm, carrying out a lesser impact on the investor's cash flow.

assets (category 2, in the list above) or to the associated capital gains (in the case of Cyprus, Hungary, Israel for the technology enterprise regime, Italy and the Netherlands).³⁴ Out of the 20 regimes explicitly providing relief to the sale of IP, 8 regimes extend relief to IP contributed in-kind, e.g. as equity. Income from IP embedded in products or processes (category 3 in the list above) is also eligible in the majority of jurisdictions. Among regimes that explicitly define qualifying IP income, 19 out of 27 regimes provided relief to embedded IP.³⁵ The regime in Greece is the only provision that provides relief solely to embedded IP income.³⁶

Figure 4. Qualifying IP income, all regimes, 2021



Note: 'All' in the chart refers to the total number of regimes for which the IP asset listed may be eligible for relief either explicitly, by means of a positive list in the legislation ('explicitly eligible') or implicitly by not being specifically excluded from eligibility. Source: 2021 KNOWINTAX survey.

Preferential tax treatment is also extended to income derived from the protection of IP rights in two thirds of regimes covered that explicitly list qualifying IP income. Most

³⁴ In some countries, relief on the sale of an IP asset is conditional on the reinvestment of the profits arising from the sale within a specific time frame or may be only eligible after a certain number of years (Section 4.4. for reinvestment conditions and this section for anti-abuse provisions).

³⁵ Income from embedded IP is typically estimated as a notional royalty using transfer pricing conventions based on what a third party would pay for the right to exploit the qualifying IP asset if the company was not exploiting it itself. This allows the estimation of the embedded IP income as a proportion of the sales price. For regimes compliant with the BEPS Action 5 minimum standard, these adjustments are made to ensure that relief is granted to the qualifying income derived from the IP and not to other types of non-qualifying income, i.e. income from marketing intangibles.

³⁶ A full exemption is provided for the income arising from the sale of goods or services embedding a patent for the three years after the sale is realised. Profits are placed in a tax-exempt reserve, which is only taxed upon distribution or capitalisation. No time limitation exists for firms to do so.

regimes covered provide protection to qualifying assets that are liable for legal protection and that confer on firms a certain monopoly over the exploitation of the IP. The extent of protection varies across IP assets, e.g. trade secrets are not provided with the same type of defensive protection as patents or trademarks. For example, protection of a production process through a trade secret does not preclude another firm from patenting the production process if developed simultaneously. When the rights conferred by the IP are infringed, e.g. by an unauthorised use of the invention, IP holders can seek legal remedies, which can be risky and costly. The successful outcome is a pay out to the IP holder for damages, e.g. profits forgone and associated costs, e.g. legal fees. Preferential tax rates on income that arises from contesting or protecting the underlying IP right was offered in 18 of out 27 countries.

In some jurisdictions, income from IP is not explicitly defined and income from non-IP sources may also be eligible for relief. In the United States, the FDII deduction applies to qualifying income from intangible property— defined as income in excess of a fixed rate of return— that is foreign-derived, i.e. Foreign Derived Deduction Eligible Income (FDDEI). FDDEI includes income from the sale of IP by the taxpayer to a foreign person and for foreign use (FDDEI sales) and income from services provided by the taxpayer to any person not located in the United States or with respect to IP not located in the United States (FDDEI services).³⁷ In principle, any income from IP meeting the FDDEI definitions would qualify. In the Czech Republic, income from IP is eligible for relief but the specific income streams are not defined, i.e. all IP income is in principle eligible. Where there is no explicit list of IP income types that are eligible for relief, all types of qualifying income are considered as potentially eligible for the purposes of this paper.³⁸ Out of the 37 regimes covered, twelve do not exclude non-IP income from relief, hence the denomination of ‘dual category’.

Some countries establish boundaries delineating the eligible transactions leading to qualifying income from an IP asset, in order to limit abuse. In Korea, only transfers of IP between domestic parties are eligible for preferential tax treatment. Spain requires that the assignee must not be a resident of a zero-tax jurisdiction or considered to be a tax haven, unless it is situated in an EU Member State and the taxpayer may prove both sound business reasons for that residency, and the actual performance of business. In Portugal, the assignee needs to satisfy three criteria. First, that the IP is used in the pursuit of an activity of a commercial, industrial or agricultural nature; second, that the results of the use of industrial property rights by the assignee do not materialise in the delivery of goods or services that represent tax-deductible expenses in the assigning entity; and third, that the assignee is not an entity residing in a country, territory or region where it is subject to a clearly more favourable tax regime. In France, relief for the alienation of an IP asset is only available if the asset was acquired more than two years before its alienation and the transaction takes place between non-related parties.

4.4. Tax instrument and preferential tax rates

The reduced taxation of qualifying IP profits is typically granted in the form of an exemption of qualifying profits or a reduced tax rate. In the case of an exemption, the regime rate is the result of multiplying the full rate (i.e. the statutory tax rate (STR) or the

³⁷ Foreign use means use, consumption or disposition which is not within the US ‘Property’ for the purpose of FDDEI includes general and intangible property provided it satisfies the criteria to be FDDEI. This regime is the only one in the study that provides relief solely to foreign-sourced income, the rest of regimes apply independent of the source of the income.

³⁸ These are marked in brackets in Table A.3.

applicable rate if different) by the exemption rate.^{39,40} As shown in Figure 3, regime rates vary from 0% to 23.8% with the full tax rate varying from 9% to 35%. Out of the regimes covered, the average reduction offered equals 65% of the full rate and ranges from a partial exemption of 20% of the full rate in Japan to a full exemption available in six jurisdictions (Czech Republic, Greece, Türkiye for the TDZ regime, Romania and Thailand for the activity and merit-based regimes and for capital gains only in Cyprus, Hungary and Italy). As Figure 5 shows, there is no discernible pattern in terms of the regime rate offered between IP regimes and dual category regimes.⁴¹ Overall, the distribution of regime tax rates is more dispersed than that of full tax rates indicating that while some convergence is observable for statutory rates, competition remains through differential regime tax rates (Figure 6).⁴²

In some cases, preferential tax treatment only applies during a predefined time period and in some cases the extent of relief phases out over time. This is the case in the Czech Republic, where the reduced rate is only available for the first ten years of operation of the firm, and in Japan, where the reduced tax rate on qualifying income only applies during the first five years upon incorporation, or in Greece where the regime only applies to profits from the sale of the goods or services embedding the IP are exempt from income tax for up to three consecutive years, starting from the year in which these profits are realised for the first time. Where these features are in place, typically for dual category regimes, the start date of the regime is the start of operations of the firm. However, in Romania the exemption for innovative firms, applicable for 10 years, also applies retroactively to firms that qualify at the time the regime was introduced (not only to new entrants). In some cases, relief is phased out over time. In Thailand, projects located in the science and technology park, promoted or approved by the Board of Investment can receive a 50 percent CIT exemption for five years after the end of its tax holiday. Regimes where relief is restricted to a given number of years are shaded with a diagonal pattern in Figure 5 with details provided in Table 4.

³⁹ Note that some countries may offer lower tax rates to the income arising from capital gains than to other types of income *in the baseline*, hence instead of referring to the STR and the regime rate, the remainder of the text refers to the full rate vs the applicable rate under the regime.

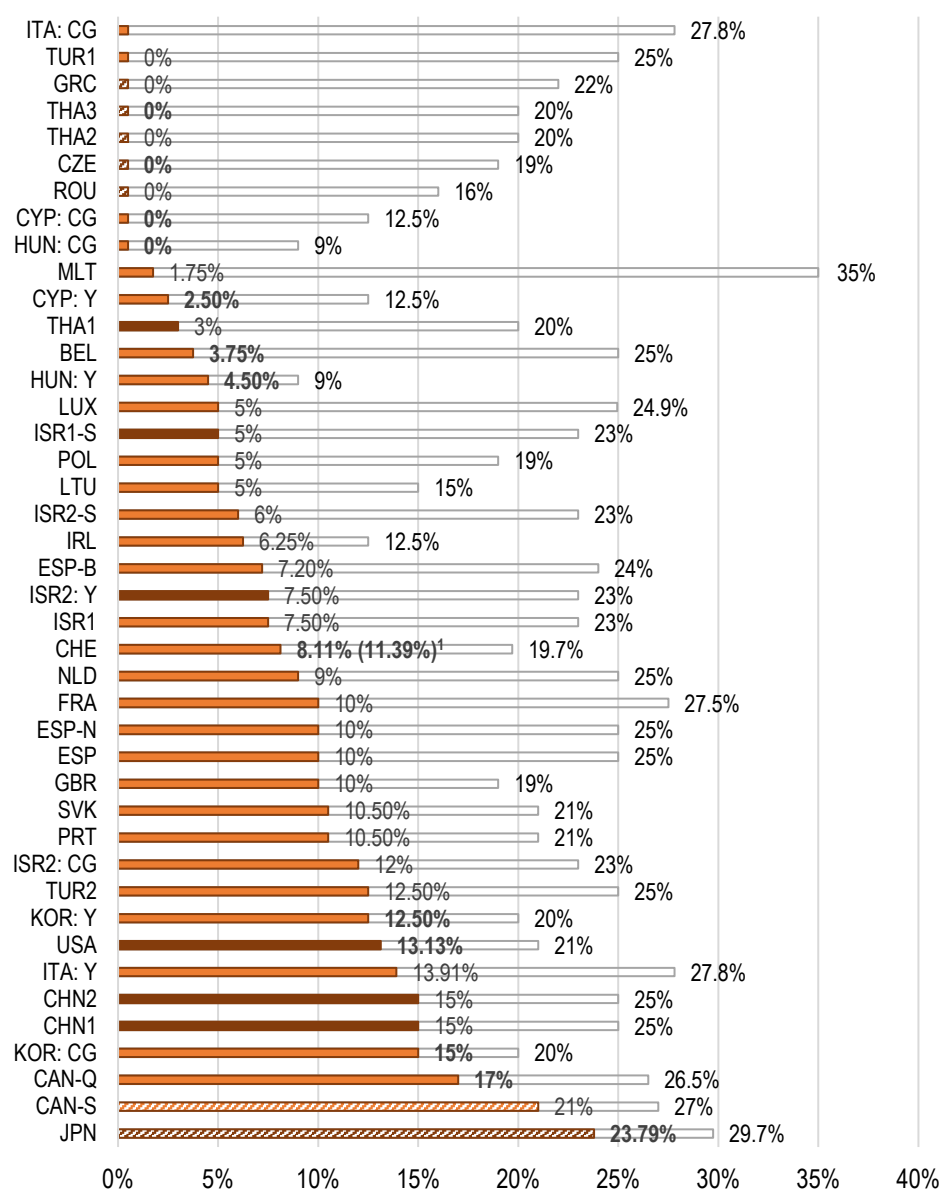
⁴⁰ When relief is granted via an exemption, changes to the full rate would immediately impact the value of the deductions, i.e. the extent of relief as measured by the difference between the full rate and the regime rate would be constant. Using a reduced rate makes the regime rate independent of changes to the full rate. The United States defines tax relief by means of a tax deduction for a fraction of qualifying profits, which shares similar properties to an exemption.

⁴¹ In principle it could be possible that dual category regimes offered a lower rate on average since they apply to a larger tax base (IP and non-IP income). However, dual category regimes appear at both ends of Figure 5.

⁴² In the case of very profitable investments, the marginal tax rate at which income is taxed becomes more relevant as the EATR will tend to towards the marginal rate at which income is taxed as the profitability of the investment tends to infinity. The presence of time limitation in the applicability of the rates and provisions affecting the tax base however elevates the importance of accounting for the tax base when making comparisons across the regimes (González Cabral, Appelt and Hanappi, forthcoming^[6]).

Figure 5. Lowest tax rate applying to IP income vs full rate, 2021

Bars with a diagonal pattern indicate preferential tax treatment is limited to a fixed number of years, darker shaded bars indicate dual category regimes, bold indicates the presence of limitations to tax benefits, CG="Capital gains" and Y="Royalties and other income" if different.

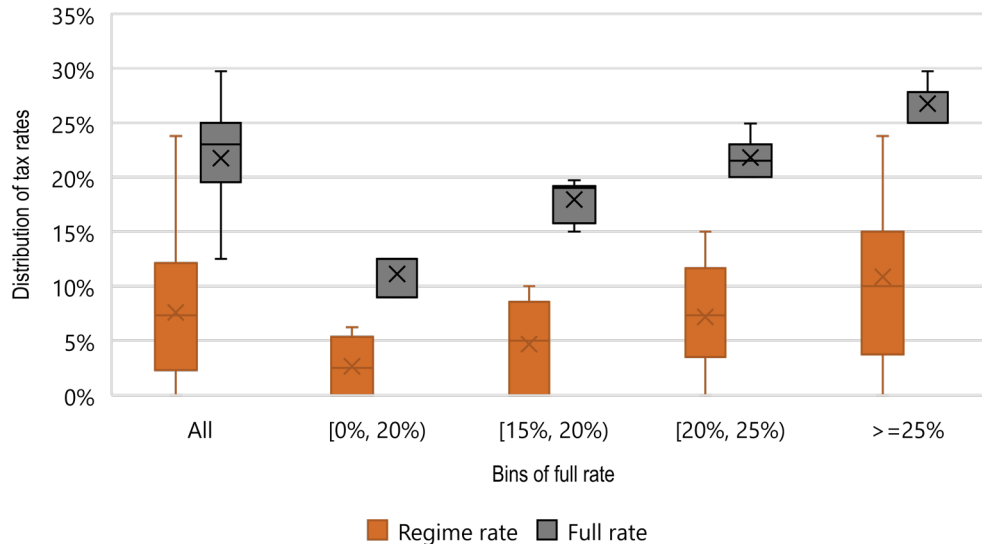


Note: The chart displays the lowest rate applicable under the regime if multiple rates exist and compares this to the full tax rate in that jurisdiction. In the chart, bars with a diagonal pattern indicate preferential tax treatment is limited to a fixed number of years, darker shaded bars indicate dual category regimes, rates in bold indicates that the regime has in place limitations to tax benefits that may cap tax benefits. The full rate is defined as the statutory tax rate or the applicable tax rate if different such as where capital gains are taxed at a different schedule. While the reduction of the regime rate from the full rate give an indication of generosity of the regime, they do not account for design features that affect the computation of tax benefits (e.g. the number of years for which the preferential tax rate applies, the definition of the tax base or the presence of ceilings that cap relief). These elements, discussed in Table 4, are crucial in facilitating a comparison of the generosity of regimes across countries. See Table A.5 for notes.

¹ IP income in Switzerland can benefit from a 90% exemption of qualifying IP income from cantonal taxation. However this exemption is subject to a cap: only 70% of a firm's total profits (IP or non-IP) can be exempt. The 8.11% rate applies to qualifying IP income and assumes that the firm has sufficient other income (non-qualifying IP or non-IP income) that is taxed at higher rates so that it is not subject to the 70% maximum relief limitation. If the firm had enough qualifying IP income that the 70% maximum relief limitation did apply, the rate applied to IP income in the city of Zurich would increase steadily to 11.39% (100% IP Income). See Table A.5 for extended notes.

Source: 2021 KNOWINTAX survey.

Figure 6. Distribution of regime vs full tax rates, by bins of the full tax rate, 2021



Note: Regime rates provided are the lowest rate possible under the regime and do not account for any caps or ceilings that might limit generosity. Ceilings and caps are in place in eight of the regimes covered (Table 4).

Source: 2021 KNOWINTAX survey.

In some jurisdictions, the generosity of preferential tax treatment varies with the type of qualifying income, the size or location of investment in the jurisdiction and in certain cases with firm size. More generous preferential tax treatment can be operationalised either through more advantageous rates or longer exemption periods. Korea offers a lower exemption on the capital gains derived from the sale of the IP than to other types of qualifying income (25% for capital gains compared to 50% for other types of qualifying income). The opposite occurs in Cyprus, Hungary and Italy, where capital gains are provided a full exemption, compared to an 80% exemption in Cyprus and a 50% exemption in Hungary and Italy for other types of qualifying income. In the case of both regimes in Israel (the preferred technology regime and preferred enterprise regime), a special status can be granted to firms belonging to groups with revenues above ISL 10 billion that allow them to access greater tax benefits and greater preferential tax treatment can be accessed if the investment takes place in a designated area (Development region A). In Thailand the tax holiday period can be extended based on 'merit'.⁴³ In the Czech Republic, the level of investment and the size of the firm unlocks access to tax benefits other than through the tax system, e.g., in the form of direct subsidies.⁴⁴

⁴³ Merit in this case is a function of the share of R&D in total investment. This regime is captured as THA3 in this report.

⁴⁴ See footnote 17.

In some cases greater preferential tax treatment can only be accessed upon meeting certain conditions, e.g. the earmarking of tax benefits. In Italy, to access the full exemption on capital gains, the taxpayer must reinvest at least 90% of capital gains in the maintenance or the development of other intangible assets, before the end of the second tax year following the year of disposal. In Hungary, capital gains are fully exempt only if they arise from the sale or in-kind contribution (i) of notified intangible assets held for over a year;⁴⁵ or (ii) of intangibles transferred to a tied-up reserve provided that capital gains are used in the following five years to purchase other intangible assets. These purchased assets must embody rights to royalties. In Belgium, relief for the sale of IP is conditional upon allocating the proceeds arising from the sale and transfer of IP as qualifying expenditure to other IP within five years of disposal.

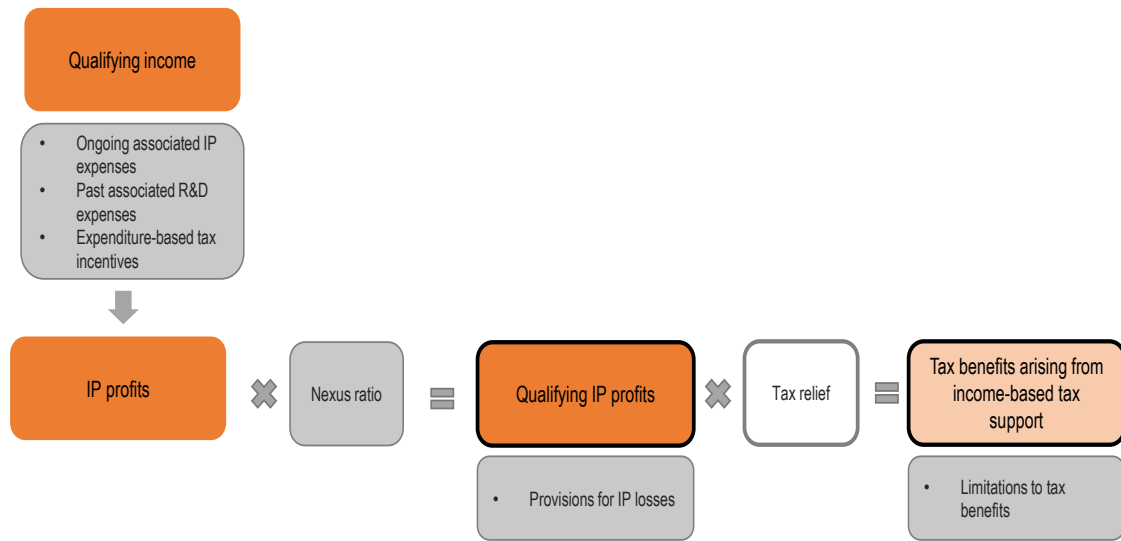
4.5. Determining qualifying profits: The tax base

Beyond the preferential tax rate, the generosity of IP regimes is impacted by the definition of the tax base, i.e., qualifying IP profit. Figure 7 shows the necessary steps to arrive from qualifying IP income to qualifying IP profits. There are three steps. First, the taxpayer must account for (i) the associated IP expenses (ongoing and past expenses if applicable) and any adjustments associated with the treatment of expenditure-based R&D tax incentives. Second, the taxpayer must make any adjustments to arrive at qualifying profits based on development conditions if applicable, e.g., the nexus ratio. Third, there may be provisions available to account for IP losses. For the countries in this study, a summary of the definition of the tax base can be found in Table 4.

An important element that affects the IP tax base is whether the tax rate at which expenses and losses are deducted from the tax base aligns with the tax rate at which IP income is taxed. In general, taxation is symmetric if the expenses incurred in relation to the development of the IP asset, as well as any IP losses, are both deducted at the same rate that is also applied to the IP income. However, if the expenses associated with an IP asset and IP losses are deductible against any type of ordinary income, and thus deducted at the statutory tax rate, this would lead to an asymmetry between the rates applied to the expenses and losses and to the income associated with the IP asset. In the latter case, the firm would benefit twice, i.e., from a (lower) preferential tax rate on IP income and a (higher) statutory tax rate at which expenses and IP losses would be deducted. Prior to the introduction of BEPS Action 5, these situations existed in many countries (Evers, Miller and Spengel, 2015^[12]).

⁴⁵ A 'notified' intangible is any intangible asset embodying rights to royalties, acquired or produced, for which the taxpayer notifies the tax authority of its acquisition within sixty days of the date of acquisition or production.

Figure 7. A schematic representation of the calculation of the tax base and firms' tax benefits



Note: Boxes in orange with no border reflect interim income-related variables in the calculation of the tax base. Boxes filled in grey represent adjustments that apply to the interim variables to arrive at the tax base, the orange box with the border; or to tax benefits (light orange box with border) obtained upon application of tax relief (empty box). The figure lists the nexus ratio as it is the development condition that most affects the calculation of tax benefits. Other development conditions may apply (Section 4.2).

Source: OECD.

The introduction of the BEPS Action 5 minimum standard led to an alignment in the calculation of the tax base, but differences in design remain that affect the level of implied subsidy. Regimes compliant with the standard need to ensure that ongoing IP expenses and IP losses are deducted at the same rate as IP income. They must also ensure that only the share of qualifying profits that relates to the R&D that was carried out by the taxpayer benefits from relief. This is typically achieved through the nexus ratio (Box 1). However differences remain across countries in four main areas. First, differences with respect to the treatment of expenses incurred by the firm in the past. Second, differences arise in the manner of accounting for IP losses. Third, differences arise in what constitutes 'nexus' for the purpose of defining qualifying profits. Finally, differences arise in the treatment of potential interactions between income and expenditure-based R&D and innovation tax incentives, where both are available to firms (OECD, 2021^[21]). The remainder of this section will discuss each of these elements with Table 4 providing a summary of the provisions available in the countries covered.

Table 4. Determining the IP tax base, selected countries, 2021

| ID | Treatment of past expenses ¹ | Treatment of ongoing expenses | Treatment of IP losses ² | Nexus ratio in the spirit of BEPS Action 5 ³ | Expenditure-based tax incentives ⁴ | Limitations to tax benefits ⁵ |
|--------|---|-------------------------------|-------------------------------------|---|---|--|
| BEL | Recapture | Net | Recapture Method | Y | Cumulative | Ceiling (TI) |
| CAN-S | None | Net | NA | N | Cumulative | None |
| CAN-Q | None | Net | NA | Y ⁽ⁱ⁾ | Cumulative | Ceiling (TI) |
| CHE | Recapture | Net | Reduced value/Recapture method | Y | Cumulative - Adjusted | Ceiling |
| CHN1 | None | Net | NA | N | Cumulative | None |
| CHN2 | None | Net | NA | N | Cumulative | None |
| CYP | Capitalisation | Net | Separate loss method | Y | NA | None |
| CZE | None | Net | NA ⁽ⁱ⁾ | N | Incompatible | Ceiling (X) |
| ESP | None | Net | Reduced value/Recapture method | Y | Cumulative | None |
| ESP-B | None | Net | Reduced value/Recapture method | Y | Incompatible | None |
| ESP-N | None | Net | Reduced value/Recapture method | Y | Cumulative | None |
| FRA | Recapture | Net | Recapture method | Y | Cumulative | None |
| GBR | None | Net | Recapture method | Y | Cumulative | None |
| GRC | None | Net | NA | Y | Cumulative | None |
| HUN | None | Net | Modified reduced value method | Y | Cumulative | Ceiling (TI) |
| IRL | None | Net | Reduced value method | Y | Cumulative | None |
| ISR1 | None | Net | Separate loss method | Y | Cumulative | None |
| ISR1-S | None | Net | Separate loss method | Y | Cumulative | None |
| ISR2 | None | Net | Separate loss method | Y | Cumulative | None |
| ISR2-S | None | Net | Separate loss method | Y | Cumulative | None |
| ITA | None | Net | Recapture method | Y | Cumulative | None |
| JPN | None | Net | NA | N | Cumulative | Ceiling (TI) |
| KOR | None | Net | Separate loss method | Y | NA | Domestic minimum tax |
| LTU | None | Net | Separate loss method | Y | Cumulative - Adjusted | None |
| LUX | Recapture | Net | Recapture method | Y | NA | None |
| MLT | None | Net | Reduced value/Recapture method | Y | Cumulative | None |
| NLD | Recapture | Net | Recapture method | Y | Cumulative - Adjusted | None |
| POL | None | Net | Separate loss method | Y | Cumulative | None |

| ID | Treatment of past expenses ¹ | Treatment of ongoing expenses | Treatment of IP losses ² | Nexus ratio in the spirit of BEPS Action 5 ³ | Expenditure-based tax incentives ⁴ | Limitations to tax benefits ⁵ |
|------|---|-------------------------------|-------------------------------------|---|---|--|
| PRT | Recapture | Net | Separate loss method | Y | Cumulative | None |
| ROU | None | Net | NA | N | NA | None |
| SVK | Capitalisation | Net | Modified reduced value method | Y | Cumulative | None |
| THA1 | None | Net | Separate Loss Method | Y | Cumulative | None |
| THA2 | None | Net | NA | N | NA | None |
| THA3 | None | Net | NA | N | NA | Ceiling (X) |
| TUR1 | Capitalisation | Net | Separate Loss Method | Y | Incompatible | None |
| TUR2 | Capitalisation | Net | Separate loss method | Y | Cumulative | None |
| USA | None | Net | NA | N | Cumulative | Ceiling (other provisions) |

Note: ⁽ⁱ⁾ data call-out to note.

¹ The treatment of past expenses refers to how past expenses are accounted upon the taxpayer first applying to the income-based tax incentive.

² The method introduced to account for IP losses is set to NA if no special provision to avoid IP losses being used against ordinary income in the period is in place. **CZE**: Losses that arise during the tax holiday period cannot be used to offset ordinary income in future periods.

³ This column refers to whether a substance-based adjustment based on the development of the asset in the spirit of BEPS Action 5 is in place to determine qualifying profits. That a nexus ratio applies does not necessarily entail full compliance with the BEPS Action 5 minimum standard. See Table A.1 for the status of review by the FHTP. **CAN**: Québec's regime (DICI) establishes a link of proportionality between the expenses attributable to Québec and total expenses to determine qualifying income (Gouvernement du Québec, 2020^[22]; Finances Québec, 2021^[23]).

⁴ 'Cumulative' in the expenditure-based tax incentives column implies that the firm can benefit from both expenditure-based and income-based tax incentives for the same investment (accounting for temporary differences). 'Adjusted' implies that income-based tax benefits are adjusted to account for benefits received in the past through expenditure-based tax provisions. 'NA' in this columns means no expenditure-based provision is in place.

⁵ Ceilings can apply on taxable income (TI), on the level of expenditure or investment (X) or with respect to other provisions. **CHE**: A maximum relief cap of 70% applies. Unused deductions over the maximum relief cap are not allowed to be carried over to future periods. **CZE**: Public support is limited to a percentage of the amount of eligible support costs. **HUN**: Deductions are subject to a cap at 50% of pre-tax income. **KOR**: A domestic minimum tax applies at 7% applies to SMEs. **THA3**: There is a cap at 300% of investment capital or expenditures incurred.

Source: 2021 KNOWINTAX survey and public sources.

4.5.1. *Treatment of ongoing expenses associated with the IP*

Among the regimes studied, tax relief applies in all cases to net income but the definition of what constitutes an associated expense varies across jurisdictions (Table 4). A net approach ensures contemporaneous symmetry between the tax treatment of associated ongoing IP expenses and IP income, i.e. tax deductions are valued at the same reduced rate as income is taxed. However, the *definition* of what constitutes an associated expense differs across countries. In Ireland, Italy, the Netherlands, and the Slovak Republic for instance, all direct and indirect costs associated with the IP, on a just and reasonable basis, can be deducted. This may include financial expenses or other overhead costs. In other countries such as Belgium or Spain, associated IP expenses are defined to be equivalent to the measure of overall expenditure calculated for the purpose of the nexus ratio, which explicitly excludes interest expenses and deductions for the depreciation of buildings (Box 1). In the United Kingdom, financial income and financial expenses, among other types of excluded income and expenditure, are also not part of the Patent Box calculation.

Differences in what type of expenditures are considered to be associated expenses (for the purpose of arriving at a net figure of IP income) define whether relief for such expenses is granted at the regime rate or at the full rate. For example, if regimes require interest expenses associated with the IP to be deducted from associated IP income, interest expenses are deducted at the regime rate. If interest expenses are not among the *types* of expenditure categories required to be deducted from IP income, then interest expenses are deducted at the full rate. For the same investment, differences in the definition of the categories of expenditure that are to be deducted from IP income to arrive at a net figure will affect the generosity of the regimes.

4.5.2. *Treatment of past expenses associated with the IP*

While countries align in the treatment of ongoing IP expenses, differences still remain in the treatment of expenses incurred in the past in computing the tax base, i.e., prior to the moment when the asset started generating income.⁴⁶ There are three main approaches to the treatment of past expenses for the computation of the tax base (Table 4):

- **No adjustment for past expenses:** Where no adjustment in the tax base for expenses incurred in the past is required, all R&D expenditure that led to the IP asset is still deducted at the statutory tax rate. From the moment where the asset starts generating income, any ongoing expenses will be deducted at the respective regime rate..
- **Recapturing of past R&D:** This approach requires expenses incurred in the past to be accounted for before any income can qualify for relief under the regime the first time the taxpayer applies for preferential tax treatment. In effect, recapturing of past expenses ensures that a share of these expenses that were originally deducted at the statutory tax rate are revalued at the regime rate. The stringency of this provision depends on the number of years for which expenses are required to be recaptured.
- **Capitalisation of R&D expenses:** This approach requires firms to display the relevant IP asset on their balance sheet in order to benefit for relief, implying that R&D expenses need to be capitalised once the conditions for the intangible asset to be recognised are met.⁴⁷ Belgium only

⁴⁶ Note that the treatment of past expenses in computing the tax base is different from the treatment of past expenses for the purpose of the nexus ratio, which is discussed further in Section 4.5.4.

⁴⁷ The accounting of intangible assets is dealt with under the International Accounting Standard (IAS) 38 which establishes the criteria for initial recognition and evaluation of intangible assets according to how they were created.

has this requirement in place if firms intend to benefit from tax relief on the sale of the IP asset. Deductions in the form of capital allowances are then observed once the asset starts generating income, which will be valued at the regime rate (Table 4).

Regimes with a requirement to account for past expenses are less generous than those without such requirement, all else equal. This is because such regimes require an entry cost to be paid by the taxpayer prior to the receipt of income-based tax relief. Among the three methods, the lack of accounting for past expenses yields the most generous tax treatment. In this particular case, there is an intertemporal asymmetry between the tax treatment of the overall expenditures that led to the creation of the IP asset and IP income. Past deductions are valued at the statutory rate, ongoing expenses are deducted, and IP income is taxed at the regime rate. A requirement to fully recapture past expenses almost ensures intertemporal symmetry between the expenses associated with the IP asset, past and ongoing, and the income generated by it. Full symmetry is usually not attained as past expenses are typically not inflation adjusted and in most cases recapturing is partial and only refers to a certain number of years. Capitalisation treats internally generated assets in a similar way as acquired intangible assets. Following international accounting standards, internally generated assets are typically recognised by the value of development costs incurred after the firm met the conditions for initial recognition of the intangible asset, i.e. by a share of all R&D costs. In the simplest case, consider that the firm only incurs current R&D expenditures over the lifetime of the project. This means that a share of R&D expenses incurred in the past during the research phase were immediately deducted at the full rate, while another share, that of development costs from the moment the asset is recognised is capitalised into the value of the asset. On this second share, deductions in the form of capital allowances are obtained and valued at the regime rate, for the countries covered, from the moment income is generated.⁴⁸ This hybrid treatment of past expenses leads to the absence of full intertemporal symmetry between associated income and expenses.

The stringency of recapturing mechanisms and their ultimate impact on firms' tax benefits depends on their design. Recapturing provisions may apply to all expenses incurred over the lifetime of the investment. Belgium requires past expenses incurred during a taxable year ending after 30 June 2016 to be deducted from qualifying IP income from the moment the firm applies for the Deduction for Innovation Income.⁴⁹ The Netherlands requires all past R&D expenses and past IP losses be added together to establish a threshold. Only qualifying income in excess of such threshold can be eligible for tax relief under the Innovation Box. This means that tax relief under the Innovation Box is only granted to qualifying income that surpasses this threshold, with any income below the threshold being taxed at the full rate. In certain countries, recapturing refers to a fixed number of years or may apply from the moment the firm elects into the regime. In Switzerland, R&D expenditure incurred over the last ten tax periods as well as any additional

The IAS 38 establishes that an intangible asset can be recognised in firms' financial accounts if the asset is identifiable, controlled by the entity, resulting from past events and that it is probable that it generates future economic benefits and its costs can be measured reliably. These are referred to as the identification and recognition criteria. For internally generated intangibles, it is more difficult for these criteria to be met. Expenditure incurred in the research phase is immediately deducted, while expenditure incurred in the development phase – if the conditions abovementioned are met – can be capitalised into the balance sheet.

⁴⁸ Investment in R&D in its most common form, current expenditure, is typically immediately deducted, which already represents a preferential tax treatment compared to other forms of tangible investment. Note that other forms of intangible investment are typically allowed an immediate deduction, e.g. expenses incurred in the training of employees.

⁴⁹ Firms can do so either as a one-off deduction or deduction split over seven years. Whichever the method chosen, a correction is made to taxable income (as a non-deductible expense) if there are differences in the benefits from choosing one method over the other. If losses are incurred in the deduction of historical costs, the deduction is carried over against qualifying income from the same IP asset.

deductions on R&D expenses, are to be added to taxable net profit.⁵⁰ A taxable hidden reserve is created to the extent of the amount added. Cantons may secure this taxation within five years after the start of the reduced taxation. In France, the recapture of past expenses relates to the expenses incurred in fiscal years after the option for the asset or group of assets to be considered for relief was exercised. This implies that the effect of this recapture mechanism on firms' benefits will depend on when the option is exercised.⁵¹

The impact of the requirement to capitalise past R&D costs on firms' tax benefits will depend on the share of total R&D expenses that are capitalised.⁵² To see this, consider again the case where total R&D expenditures over the lifetime of the project are in the form of current expenditures (typically immediately deducted). In this case, the lower the share of overall R&D costs that are capitalised into the value of the asset, the lesser the 'penalty' of forgoing the immediate deductibility of the R&D expenses. However, there might still be commercial or earnings management reasons that will make capitalisation desirable for a firm, including the possibility to access a preferential tax treatment on the associated income.

4.5.3. Treatment of IP losses

Most countries in the study have mechanisms in place that ensure that IP losses are deducted at the same rate as IP income is taxed, ensuring symmetry between the profit and loss positions.⁵³

There are three methods typically observed, which are ordered below from the most to the least generous.

- **The reduced value method** ensures that IP losses can be used against ordinary income, but at the regime rate using a deduction or a credit.
- **The recapture method** allows IP losses to be used against ordinary income at the ordinary rate, but they must be recaptured before IP profits may be taxed at the regime rate.
- **The separate loss method** puts IP and non-IP income in different baskets ensuring that IP losses can only be used to offset IP income.

All three methods may have different implications for firms in practice regarding the extent to which they allow deferrals on the taxation of ordinary income and the extent to which IP losses are used when firms do not have sufficient future IP profits. Deferral of the taxation of ordinary income is possible under the recapture and reduced-value methods, with the first method being more generous as the second only allows partial relief at the regime rate. For firms with insufficient future IP profits, the recapture method may lead firms to never fully recapture IP losses if they do not make enough IP profits in the future. The same occurs, but to a lesser extent, with the reduced-value method but incentives are less strong. The separate loss method is the least generous of the three as no deferral on ordinary income is allowed, IP losses only offset IP profits, and in the case of insufficient IP profits, IP losses are simply forgone.

Some countries allow a combination of the methods outlined above or combine them to address different loss outcomes. In Malta, firms can choose between the reduced value and the recapture method. Spain operates a dual system depending on the balance of positive and negative IP profits claimed

⁵⁰ Additional deductions are available on an optional basis in certain cantons from 2020 onwards.

⁵¹ For instance, if most firms apply to qualify for the IP regime when revenues from the IP are to be expected, then the effect of the recapturing mechanism might be limited, as there would be fewer years of past R&D to account for.

⁵² It may be argued that in some cases where past expenses need to be accounted for prior to IP profits benefitting from the regime, the design of IP regimes might be less beneficial for start-ups or SMEs if they are not able to have sufficient profits from the IP to account for all R&D undertaken in the past. Evidence suggests that tax expenditures from these measures are typically tilted towards larger taxpayers who would likely disproportionately benefit from an elimination of recapturing mechanisms, see Appelt et al. (forthcoming^[2]).

⁵³ This is one of the requirements introduced by the BEPS Action 5 minimum standard (Box 1).

under the regime. If the amount of IP losses under the regime does not offset the amount of IP profits that have been subject to the regime, the offset mechanism is similar to a reduced value method, i.e. losses can be offset at the reduced value. If the amount of IP losses is higher than the IP profits that have been subject to the regime, excess IP losses can be offset against ordinary income and this same amount needs to be recaptured before any IP profits can qualify for relief matching the recapture method. A similar system applies in Switzerland. The regime distinguishes between the treatments of actual versus accounting losses. If a global loss stemming from the lack of sufficient IP profits for all IP considered is attained, there is no reduced taxation and losses can be used to offset profits. In future periods, these losses need to be recaptured, i.e. no profits can be subject to reduced taxation until the amount of those losses has been reached. 'Accounting' losses that arise from the computation of qualifying IP profits due to the application of the 6% return on profit, the deduction for the compensation of the trademark or the application of the nexus ratio, are deemed to be merely mathematical and they are not compensated against other profits nor need to be carried over to future periods.

Other countries implement variations of the methods listed above that seek to preserve the symmetric taxation of IP losses and IP income. In the Netherlands, IP losses increase the threshold for IP income to benefit from relief (in the same way as past expenses). A similar threshold approach is used in Luxembourg (losses can be carried over for 17 years). The Slovak Republic and Hungary use a slightly different approach to those listed above, but still ensure the equal treatment of IP profits and IP losses. In the case of the Slovak Republic, a share of associated IP expenses equivalent to that of the IP income that has been exempt is non-deductible for tax purposes. For example, if 50% of royalties are exempt, 50% of associated expenses are non-deductible for tax purposes. There is no need for a separate calculation of IP income and IP losses. In Hungary, if a firm previously benefitting from the regime incurs an IP loss, the tax base needs to be increased by the same percentage of exemption that applies when the firm receives IP profits. For example, consider that the regime allows a 50% exemption on qualifying income, if the firm incurs an IP loss, 50% of the IP loss needs to be added to taxable income. While the mechanics of the two methods applied in the Slovak Republic and in Hungary appear different they achieve the same outcome: faced with an equal IP profit and IP loss, the tax payments are increased by the same amount in the case of an IP loss as they are decreased in the case of an IP profit. Given that both methods allow the use of IP losses in the same period accounting for their reduced value, this method is termed the 'modified reduced value method' in Table 4.

In certain cases, there are no specific provisions that prevent the use of IP associated losses against ordinary income in future periods. Where carry-over provisions are available for losses incurred during the preferential tax period without any limitations, this would lead to an asymmetry between the treatment of IP profits and losses, as losses would be allowed to reduce taxable ordinary income at a higher rate than income is taxed. This case is not common among the regimes analysed. For instance, in 2021, firms using the Greek IP regime could benefit for an exemption on the profits from the sale of goods or services comprising the exploitation of a patent for the three consecutive fiscal years after the first year the sale is realised. The exempted profits are recorded in a special reserve and only taxed upon distribution or capitalisation. If IP losses were derived, firms were able to carry-over these losses for a period of five years. This led to asymmetric treatment of IP income, where if a profit is derived the firm can constitute a reserve and hence be exempt and if they are negative they could be offset against ordinary income (at the full rate). This regime has already been amended to comply with the nexus approach by not allowing IP losses arising in the following two years after tax benefits to offset ordinary income. The new regime was implemented from 1 January 2022.⁵⁴ For some regimes such as those in place in the Czech Republic or Japan no specific rules to limit the use of IP losses to offset ordinary income exist.

⁵⁴ The regime in Greece is in the process of being amended to be made compliant with the BEPS Action 5 minimum standard (OECD, 2022^[24]).

4.5.4. Additional adjustments based on substance: The nexus ratio

To determine *qualifying IP profits*, most countries make a further adjustment to account for the **development of the IP asset** (Figure 7). In accordance with the BEPS Action 5 minimum standard, most regimes implement these requirements through the nexus ratio (Box 1, Table 4), which establishes a link between the expenditures incurred in developing the IP and qualifying IP profits. There are important elements worth considering when understanding the impact of the nexus ratio and its calculation in the determination of the share of IP profits qualifying for relief:

- **The definition of qualifying expenditure for the purpose of the nexus ratio determines the type of acquisition strategies that would entail tax benefits for the firm.** Definitions of qualifying expenditure may be stricter in certain jurisdictions as discussed in Section 4.2.2. This affects the strategies that firms can use to obtain IP that still qualifies for tax benefits. It may also impact firms strategies in terms of the location of expenditures, as qualifying expenditures may be subject to geographical limitations depending on whether the entity or jurisdictional versions of the nexus ratio are used.⁵⁵
- **The nexus ratio is cumulative.** It accounts for all past expenses incurred in relation to the IP asset, and hence the nexus ratio changes over time with the acquisition strategies used by firms. This requires firms to have tracking and tracing mechanisms that allow the allocation of R&D expenses to given IP assets.
- **Where possible, the nexus ratio should be calculated on an asset-per-asset basis, or if this is not possible, then on a family of assets basis.**⁵⁶ This implies that the nexus ratio, and the ultimate tax benefits the firm can access, may vary across the portfolio of IP assets held by the firm depending on the acquisition strategy used. This means that firms may observe different effective tax rates for the same type of intangible asset depending on the acquisition strategy used.
- **In some countries, the nexus ratio can be rebutted in exceptional circumstances.** In exceptional circumstances a fraction other than the nexus fraction can be applied if the taxpayer is able to demonstrate that the calculated fraction does not represent its value added to the IP. This possibility to treat nexus as a rebuttable presumption is available in Belgium and the United Kingdom.⁵⁷

Overall, the nexus ratio may create variation in the extent of relief available for different qualifying IP assets within the firms' IP portfolio. Firms face the preferential tax rate with respect to the share of qualifying profits and the full tax rate for the share that is not deemed qualifying by the nexus ratio. In essence, the firm faces a weighted tax rate on its IP income with the weights given by the nexus ratio. Since the nexus ratio varies by IP asset, the firm faces a distribution of tax rates that ranges between the preferential and the full tax rate, with different IP assets potentially sitting at different ends of the distribution depending on the acquisition strategy used. These differences come on top of differences across countries in the definition of the nexus ratio that would also affect the eligibility of support across jurisdictions (Section 4.2.2.).

⁵⁵ All regimes that apply a nexus ratio, with the exception of the Slovak Republic, allow a nexus uplift of 30% of the qualifying expenditures to provide some buffer for acquisition costs or related party outsourcing.

⁵⁶ This would be the case where the firm is not able to separately identify the IP from a product.

⁵⁷ In the Netherlands, instead of calculating a nexus ratio or the profits to allocate to an intangible asset, the taxpayer may attribute 25% of profits with a maximum of EUR 25 000 to the Innovation Box if the IP was developed in that same year or in the two preceding years.

4.5.5. Interaction with expenditure-based tax incentives for R&D and innovation

In most jurisdictions, firms can make use of expenditure-based and income-based tax incentives over the lifetime of the investment. All jurisdictions in the study with income-based incentives except Cyprus and Romania, also offer expenditure-based R&D tax incentives. With the exception of the Czech Republic and Türkiye, the use of expenditure-based R&D tax incentives by a firm does not preclude the use of income-based tax incentives.⁵⁸ At the same time, applying for expenditure-based tax relief is not a requirement to apply for income-based tax incentives in any of the countries in the study, with the exception of the Netherlands for which an R&D statement from the application to the WBSO (i.e. the expenditure-based payroll withholding tax credit scheme for R&D employees) is required to apply for income-based tax relief.

In the majority of regimes surveyed, there are no requirements to adjust the calculation of the tax base of income-based tax incentives for tax benefits received through expenditure-based tax incentives. The interaction of the two becomes particularly salient in situations where expenditure-based tax incentives are granted in the form of tax allowances, which have the effect of inflating the firm's expenses, or where they are granted in the form of relief to payroll withholding taxes or to social security contributions (SSCs) that result in a reduced labour cost for the firm (and have the effect of deflating the firm's expenses). In the United Kingdom, relief granted through expenditure-based incentives (R&D tax allowance and the Research and Development Expenditure Credit Scheme (RDEC)) are excluded as part of the Patent Box computation. In Belgium, the full labour cost (grossed up of any reduction through the application of the payroll withholding tax credit) is used to compute qualifying profits. This means that the SSC deduction is still valued at the full rate and the benefit of the expenditure-based incentive is not adjusted.

Certain regimes require firms to recapture the expenditure-based tax incentives received in the past when applying for income-based tax incentives for the first time. Where recapturing provisions are in place, the government that shared in the risks from the investment is able to recoup some of the upfront subsidy in cases of success. In the Netherlands, the payroll withholding tax credit (WBSO) that effectively reduces the labour cost for the firm is not grossed up to compute IP profits for the purpose of the Innovation Box. In this case, the deduction through the expenditure-based R&D tax incentive is valued at the reduced rate. In Lithuania, associated R&D costs are included in the computation of qualifying IP profits including the value of the tax allowance (200% tax allowance rate, i.e. R&D costs are deducted three times from taxable income). This leads to an adjustment to the value of the expenditure-based incentive at the regime rate. In Switzerland, baseline and any enhanced tax deductions obtained in the past ten years need to be added to taxable profits. Cantons may secure this taxation within five years after the start of the reduced taxation. A taxable hidden reserve is created to the extent of the amount added. If hidden reserves are taxed at the full rate, this implies that the enhanced deduction are revalued at the regime rate (excluding the time value of money).

4.6. Calculation of and limitations to the use of tax benefits

Tax relief, either through a reduced tax rate or an exemption, is typically administered by means of a deduction from taxable income. The value of such deductions simply equals the exemption rate

⁵⁸ Until 2022, in Poland expenditure-based R&D tax relief could not be settled against IP profits subject to the IP regime, but rather against ordinary income. From 1st January 2022, a taxpayer that qualifies for both the IP regime and R&D relief can apply R&D tax relief against IP income. However, the IP income can be decreased only by the R&D costs that directly led to creation, development or improvement of qualified IP right. R&D costs linked to the operational activity and income cannot be deducted from the IP income. The taxpayer has to differentiate the sources of his income: for the regular non-IP related income and IP related income and same rule taxpayer should apply to costs subject to R&D tax relief.

multiplied by qualifying profits for most countries that define tax relief based on an exemption, e.g. Portugal or Hungary. For countries operating a reduced tax rate such as the United Kingdom or the Netherlands, the deduction is calculated by multiplying qualifying profits by the proportionate reduction in the full rate. This adjustment ensures that IP profits are ultimately taxed at the reduced rate. The Slovak Republic uses a different method to administer the tax relief. Instead of granting a tax deduction, the share of qualifying income and its associated expenditures are exempt from the calculation of taxable income. With this method, the case where the firm has insufficient profits to use the regime does not arise.

In most countries, there is no limit to the use of tax benefits arising from the regime. As relief is typically administered by means of a tax deduction, it may occur that while the firm derives positive IP profits, it does not have sufficient taxable income to use the deduction in full. The tax deduction either reduces the taxable income of the firm, lowering the tax liability, or makes the firm enter into a loss position if the firm has insufficient taxable income. Note that in the second case the loss is a general loss, not IP specific, and the general loss-offset provisions would apply. For instance, in the United Kingdom, if the deduction makes the firm enter in a loss position, losses can still be utilised by other entities within the same corporate group or carried forward at the full rate.

Certain regimes establish ceilings or caps that limit the extent of tax benefits that can be accessed through income-based tax incentives. In Belgium and Cyprus, the use of the tax deduction cannot drive the firm into a loss position, hence it is limited to the taxable income of the firm with any unused deductions being carried over to future periods. In Japan, any unused tax benefits are simply lost. In Hungary, tax relief is capped at 50% of taxable income with any unused amount being carried-over to future periods. In the United States, the FDII deduction is limited if a domestic corporation's taxable income is less than the sum of its Global Intangible Low-Taxed Income (GILTI) and FDII, with no carry-over or recapturing of unused FDII deductions.⁵⁹ Ceilings may also be a function of expenditure incurred as is the case of the Czech Republic or with respect to Thailand's IBC regime. General tax provisions may also limit tax benefits. In Switzerland, the maximum amount of tax relief is capped at the cantonal level. The rates of maximum relief vary across cantons but the amount of relief provided cannot be higher than 70% of taxable income. In Korea, a minimum tax sets a lower bound to the effective tax rate that firms can attain. Note that relief may also be limited by the number of years the asset appears in the balance sheet (e.g. capitalisation); or by the application of time-limited reduced tax rates.

5. Conclusion

The KNOWINTAX project seeks to improve the measurement and analysis of income-based tax incentives, advancing prior OECD work on expenditure-based tax incentives for R&D and innovation (OECD, 2021^[21]). Covering overall 49 countries, including all OECD countries and EU countries, this paper provides an overview of the availability of income-based tax incentives and a qualitative discussion of the design features of income-based tax incentives for R&D and innovation for 27 countries with such provisions in force in 2021. These design features will feed into a forthcoming paper that will translate design information in cross-country comparable indicators of implied tax subsidy (González Cabral, Appelt and Hanappi, forthcoming^[6]).

As part of the next steps, the work will seek to develop indicators that facilitate a cross-country comparison of the implied subsidy granted through income-based tax incentives. Building on this initial cross-section of design features, the work will seek to expand this information historically to construct

⁵⁹ The domestic corporation taxable income is defined as gross income minus deductions including deductions for net operating losses under section 172, not taking into account the section 250 deduction. There are no carry-forward or carry-back provisions (nor recapturing accounts) of a taxpayer's FDII deduction in excess of their taxable income limitation.

time series indicators of implied subsidy rates. Those indicators that can facilitate the analysis of trends of support and their comparison across jurisdictions. Such time series indicators paired with indicators currently under development of forgone revenue and uptake can serve further investigate the use, distribution consequences and effectiveness of such policies. Given that most countries combine the use of income-based and expenditure-based tax incentives, future work will seek to provide an integrated view of public support to business R&D through the tax system building on previous OECD work (González Cabral, Appelt and Hanappi, 2021^[9]). An in-depth characterisation of design features can also help improve understanding of trends in revenue forgone and uptake across jurisdictions (Appelt, González Cabral and Hanappi, forthcoming^[21]).

References

- Alstadsaeter, A. et al. (2015), "Patent Boxes Design, Patents Location and Local R&D", No. No 6/2015, IPTS Working Papers on Corporate R&D and Innovation, <https://ec.europa.eu/jrc> (accessed on 26 March 2020). [16]
- Appelt, S. et al. (2016), "R&D Tax Incentives: Evidence on design, incidence and impacts", in *OECD Science, Technology and Industry Policy Papers*, OECD Publishing, Paris, <https://doi.org/10.1787/5jlr8fldqk7j-en>. [3]
- Appelt, S., A. González Cabral and T. Hanappi (forthcoming), "Income-based tax incentives for R&D and innovation: Measures of tax expenditure and uptake", *OECD Science, Technology and Innovation Working Paper series*. [2]
- Arrow, K. (1962), "Economic Welfare and the Allocation of Resources for Invention", in *The Rate and Direction of Inventive Activities: Economic and Social Factors*, Princeton University Press, Princeton, NJ, <http://www.nber.org/chapters/c2144> (accessed on 27 March 2020). [8]
- Celani, A., L. Dressler and M. Wermenlinger (2022), "Investment Tax Incentives Database: Enhancing transparency through comparable data in developing countries", *OECD Working paper*. [25]
- Ciaramella, L. (2017), "Patent Boxes and the Relocation of Intellectual Property", *SSRN Electronic Journal*, <https://doi.org/10.2139/ssrn.2943435>. [17]
- Clift, C. (2007), "Data protection and data exclusivity in pharmaceuticals and agrochemicals.", in *Intellectual property management in health and agricultural innovation: a handbook of best practices, Volumes 1 and 2*, <https://www.cabdirect.org/cabdirect/abstract/20083164080> (accessed on 18 October 2021). [26]
- Dischinger, M. and N. Riedel (2011), "Corporate taxes and the location of intangible assets within multinational firms", *Journal of Public Economics*, <https://doi.org/10.1016/j.jpubeco.2010.12.002>. [13]
- European IP Helpdesk (2019), *Your Guide to IP Commercialisation*. [20]
- Evers, L., H. Miller and C. Spengel (2015), "Intellectual property box regimes: effective tax rates and tax policy considerations", *International Tax and Public Finance*, Vol. 22/3, pp. 502-530, <https://doi.org/10.1007/s10797-014-9328-x>. [12]
- Finances Québec (2021), "Modifications apportées à la deduction incitative pour la commercialisation des innovations au Québec", *Bulletin d'information 17 Décembre 2021*, http://www.finances.gouv.qc.ca/documents/Bulletins/fr/BULFR_2021-9-f-b.pdf. [23]

- Gaessler, F., B. Hall and D. Harhoff (2021), "Should there be lower taxes on patent income?", *Research Policy*, Vol. 50/1, p. 104129, <https://doi.org/10.1016/J.RESPOL.2020.104129>. [18]
- González Cabral, A., S. Appelt and T. Hanappi (2021), *Corporate Effective Tax Rates for R&D: The case of expenditure-based tax incentives*, OECD Publishing, Paris, <https://doi.org/10.1787/ff9a104f-en>. [9]
- González Cabral, A., S. Appelt and T. Hanappi (forthcoming), "Effective tax rates including income-based tax incentives for R&D intangible assets", *OECD Taxation Working Paper*. [6]
- Gouvernement du Québec (2020), *Budget 2020-2021. Renseignements additionnels*, http://www.budget.finances.gouv.qc.ca/budget/2020-2021/fr/documents/Budget2021_RenseignementsAdd.pdf (accessed on 10 May 2022). [22]
- Griffith, R., H. Miller and M. O'Connell (2014), "Ownership of intellectual property and corporate taxation", *Journal of Public Economics*, Vol. 112, pp. 12-23, <https://doi.org/10.1016/j.jpubeco.2014.01.009>. [1]
- Hall, B. (2019), *Tax Policy for Innovation*, National Bureau of Economic Research, Cambridge, MA, <https://doi.org/10.3386/w25773>. [4]
- Keen, M. and K. Konrad (2013), "The Theory of International Tax Competition and Coordination", *Handbook of Public Economics*, Vol. 5, pp. 257-328, <https://doi.org/10.1016/B978-0-444-53759-1.00005-4>. [14]
- Mooij, R., A. Klemm and V. Perry (2021), "Corporate Income Taxes under Pressure", *International Monetary Fund*, <https://doi.org/10.5089/9781513511771.071>. [11]
- OECD (2022), *Corporate Tax Statistics database*, <https://www.oecd.org/tax/beps/corporate-tax-statistics-database.htm>. [28]
- OECD (2022), "Harmful Tax Practices 2018 Progress Report on Preferential Regimes (Update as of July 2022 of Peer Review Results)", <https://www.oecd.org/tax/beps/harmful-tax-practices-consolidated-peer-review-results-on-preferential-regimes.pdf> (accessed on 9 June 2022). [24]
- OECD (2022), "Harmful Tax Practices 2018 Progress Report on Preferential Regimes July 2022", <https://www.oecd.org/tax/beps/harmful-tax-practices-peer-review-consolidated-results-on-preferential-regimes.pdf> (accessed on 9 August 2022). [27]
- OECD (2021), "Harmful Tax Practices 2018 Progress Report on Preferential Regimes: Update (August 2021)", *OECD/G20 Base Erosion and Profit Shifting Project*, <https://www.oecd.org/tax/beps/harmful-tax-practices-peer-review-results-on-preferential-regimes.pdf> (accessed on 17 October 2021). [7]
- OECD (2021), *OECD R&D Tax Incentive Database*, <http://oe.cd/rdtax>. [21]
- OECD (2015), *Addressing the Tax Challenges of the Digital Economy, Action 1 - 2015 Final Report*, OECD/G20 Base Erosion and Profit Shifting Project, OECD Publishing, Paris, <https://doi.org/10.1787/9789264241046-en>. [10]
- OECD (2015), *Countering Harmful Tax Practices More Effectively, Taking into Account Transparency and Substance, Action 5 - 2015 Final Report*, OECD/G20 Base Erosion and Profit Shifting Project, OECD Publishing, Paris, <https://doi.org/10.1787/9789264241190-en>. [5]

OECD (1998), *Harmful Tax Competition: An Emerging Global Issue*, OECD Publishing, Paris, [15]
<https://doi.org/10.1787/9789264162945-en>.

WIPO (2004), “WIPO Intellectual Property Handbook”, *WIPO Publication No. 489 (E)*, [19]
https://www.wipo.int/edocs/pubdocs/en/wipo_pub_489.pdf (accessed on 29 March 2021).

Annex A. Detailed design tables

Table A.1. General information on regimes covered in the study, 2021

| ID | Regime name | Introduction | Central | IP regime | FHTP status | FHTP decision (as of April 2021) ¹ | FHTP decision date |
|-------|--|--------------|---------|-----------|-------------|---|--------------------|
| BEL | Deduction for innovation income | 2016 | x | x | R | Not harmful (amended) | 2017 March |
| CAN-Q | Déduction incitative pour la commercialisation des innovations (DICI) (Québec) | 2021 | | x | | | |
| CAN-S | Saskatchewan Commercial Innovation Incentive (SCII) | 2017 | | x | | | |
| CHE | IP box | 2020 | | x | R | Not harmful | 2020 October |
| CHN1 | Reduced rate for high & new tech enterprises (HNTE) | 2008 | x | | R | Not harmful | 2017 May |
| CHN2 | Tech-based SMEs (TSMES) | 2017 | x | | | | |
| CYP | IP Box regime (new regime) | 2016 | x | x | | | |
| CZE | Investment incentives for R&D centres | 2012 | x | | | | |
| ESP | Partial exemption for income from certain intangible assets (Federal regime) | 2004 | x | x | R | Not harmful (amended) | 2018 October |
| ESP-B | Partial exemption for income from certain intangible assets (Basque country) | 2008 | | x | R | Not harmful (amended) | 2019 January |
| ESP-N | Partial exemption for income from certain intangible assets (Navarra) | 1997 | | x | R | Not harmful (amended) | 2019 January |
| FRA | Reduced corporation tax rate on IP income | 1979 | x | x | R | Not harmful (amended) | 2019 January |
| GBR | Patent Box | 2013 | x | x | R | Not harmful (amended) | 2016 November |
| GRC | Tax patent incentives (second regime) | 2018 | x | x | R | In the process of being amended | 2020 October |
| HUN | IP regime for royalties and capital gains | 2003 | x | x | R | Not harmful (amended) | 2016 November |

| ID | Regime name | Introduction | Central | IP regime | FHTP status | FHTP decision (as of April 2021) ¹ | FHTP decision date |
|--------|--|--------------|---------|-----------|-------------|--|--------------------|
| IRL | Knowledge development box (second regime) | 2016 | x | x | R | Not harmful | 2016 November |
| ISR1 | Preferred enterprise regime | 2011 | x | | R | Not harmful | 2017 July |
| ISR1-S | Special Preferred enterprise regime | 2011 | x | | R | Not harmful | 2017 July |
| ISR2 | Preferred technology enterprise regime | 2017 | x | x | R | Not harmful | 2017 July |
| ISR2-S | Special preferred technology enterprise regime | 2017 | x | x | R | Not harmful | 2017 July |
| ITA | Taxation of income from intangible assets | 2015 | x | x | R | Not harmful (amended) except for the extension to new entrants for trademarks between 1 July 2016 and 31 December 2016, which is harmful | 2017 May |
| JPN | Tax incentive for specified business in the National Strategic Zones | 2017 | x | | | | |
| KOR | Tax reduction for transfer or leases of technology (second regime) | 2014 | x | x | R | Not harmful (amended) | 2017 September |
| LTU | IP taxation regime | 2018 | x | x | R | Not harmful | 2018 October |
| LUX | IP regime | 2018 | x | x | R | Not harmful | 2018 April |
| MLT | Patent Box regime | 2019 | x | x | R | Not harmful | 2019 June |
| NLD | Innovation box ² | 2007 | x | x | R | Not harmful (amended) | 2016 November |
| POL | IP box | 2019 | x | x | R | Not harmful | 2019 June |
| PRT | Partial exemption for income from certain intangible property | 2014 | x | x | R | Not harmful (amended) | 2016 November |
| ROU | Exemption for taxpayers engaged in R&D and innovation | 2017 | x | | | | |
| SVK | Patent Box | 2018 | x | x | R | Not harmful | 2018 April |
| THA1 | International business centre | 2019 | x | | R | Not harmful | 2019 June |
| THA2 | Activity-based tax incentive | 2003 | x | | | | |
| THA3 | Merit-based tax incentive | 2015 | x | | | | |
| TUR1 | Technology development zones regime | 2001 | x | x | R | Not harmful (amended) except for the extension to new entrants between 1 July 2016 and 19 October 2017, which is harmful | 2018 April |
| TUR2 | 5/B regime | 2015 | x | x | R | Not harmful | 2016 November |
| USA | Foreign derived intangible income (FDII) | 2018 | x | | R | In the process of being eliminated/amended | 2021 April |

Note: ¹FHTP decisions are listed as of April 2021, the time of drafting this report and reference year of the design parameters. Since January 2022, Greece operates an amended regime that has been brought in line with the nexus approach. The July 2022 FHTP decision for this regime changed to 'not harmful (amended)' (OECD, 2022^[24]). Similarly, in 2022, the regime in Italy has been repealed and changed for an expenditure-based tax incentive. The IP regime in the Netherlands was referred to as 'Patent Box' before its 2010 reform.

Source: 2021 KNOWINTAX survey, FHTP peer review questionnaires and public sources.

Table A.2. Qualifying IP assets by regime, OECD and selected economies, 2021

Eligible 'x' and potentially eligible '(x)', ⁽ⁱ⁾ indicates a note to data point

| | Patent ¹ | Supplementary Protection Certificates ² | Utility models/ Short-term patents | Plant variety rights | Orphan drugs ³ | Industrial designs and models ⁴ | Industrial processes ⁵ | Secret formulae or processes or other trade secrets | Information concerning know-how | Products benefiting from data or market exclusivity ⁶ | Copyrighted software ⁷ | Patentable inventions (small taxpayers) ⁸ | Copyrights of literary, artistic, scientific work | Trademarks ⁹ | Other ¹⁰ | IP assets not defined or unrestricted |
|--------|---------------------|--|------------------------------------|----------------------|---------------------------|--|-----------------------------------|---|---------------------------------|--|-----------------------------------|--|---|-------------------------|---------------------|---------------------------------------|
| BEL | x | x | x | x | x ⁽ⁱ⁾ | | x | | | x ⁽ⁱ⁾ | x | | | | | |
| CAN-S | x | | | x | | | | x | | | x | | | | | |
| CAN-Q | x | x | | x | | | | | | | x | | | | | |
| CHE | x | x | | x | x | | | | | x | ⁽ⁱ⁾ | | | | x ⁽ⁱ⁾ | |
| CHN1 | x ⁽ⁱ⁾ | (x) | x | x | (x) | x ⁽ⁱ⁾ | (x) | (x) | (x) | (x) | x | (x) | (x) | (x) | x ⁽ⁱ⁾ | x |
| CHN2 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | x |
| CYP | x | x | x | x | x | | | | | | x | x | | | | |
| CZE | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | x |
| ESP | x | x ⁽ⁱ⁾ | x | | | x | | | | | x ⁽ⁱ⁾ | | | | | |
| ESP-B | x | x ⁽ⁱ⁾ | x | | | | | | | | x ⁽ⁱ⁾ | | | | | |
| ESP-N | x | x ⁽ⁱ⁾ | x | | | x | | | | | x ⁽ⁱ⁾ | | | | | |
| FRA | x | x | x | x | | | x ⁽ⁱ⁾ | | | | x | x | | | | |
| GBR | x | x | | x | x | ⁽ⁱ⁾ | | | | | | | | | | |
| GRC | x | | | | | | | | | | | | | | | |
| HUN | x | x | x | x | x | | | | | | x | | | | | |
| IRL | x | x | | x | | | | | | | x | x | | | | |
| ISR1 | x | | x | x | x | | | | | | x | x | | | | |
| ISR1-S | x | | x | x | x | | | | | | x | x | | | | |
| ISR2 | x | | x | x | x | | | | | | x | x | | | | |
| ISR2-S | x | | x | x | x | | | | | | x | x | | | | |
| ITA | x | x | x | x | x | x | x | x | | | x | | | | x ⁽ⁱ⁾ | |
| JPN | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | x |
| KOR | x | | x | | | | | x | | | | x | | | | |
| LTU | x | x | | | | | | | | | x | | | | | |
| LUX | x | x ⁽ⁱ⁾ | x | x | x | | | | | | x | | | | x | |
| MLT | x | x | x | x | x | x | | | | | x | x | | | | |
| NLD | x | x | x | x | x | | | | | x | x | x | | | x | |
| POL | x | x ⁽ⁱ⁾ | x | x | | x | | | | x | x ⁽ⁱ⁾ | | | | x ⁽ⁱ⁾ | |
| PRT | x | | | | | x | | | | | x | | | | | |
| ROU | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | x |
| SVK | x | x | x | | | | | | | | x | | | | | |
| THA1 | x | | | | | | | | | | x | | | | | |
| THA2 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | x |
| THA3 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | x |
| TUR1 | x | | x | x | | | | | | | x | x | | | | |
| TUR2 | x | | x | | | | | | | | | | | | | |
| USA | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) ⁽ⁱ⁾ | (x) | (x) | (x) | (x) | x |
| All | 37 | 26 | 28 | 27 | 21 | 14 | 11 | 11 | 8 | 12 | 32 | 19 | 8 | 8 | 13 | 8 |

Note: Brackets are used to signal that a specific list of IP assets is not defined under the regime, but that none of the IP assets are explicitly excluded and hence potentially eligible. Note that for regimes found to be compliant with the BEPS Action 5 minimum standard, all assets ticked above must be legally protected or liable for legal protection and should be the result of R&D carried out by the taxpayer. Notes are organised by columns (i) indicates a note call-out for the particular regime with reference to the column where it sits.

¹ **CHN1**: In order to qualify for HNTE status the firm must hold ownership of the IP related to its core technology, which can be protected through one of several different forms of IP marked with an 'x' in this table. Upon qualifying as a HNTE, the reduced tax rate applies to all income from the firm, which may include other forms of IP.

² **ESP/ ESP-B/ ESP-N**: SPCs of medical products and plant protection products. **LUX**: Including prorogations of SPCs. **POL**: Supplementary protection certificates for patents of medicinal products or plant protection products.

³ **BEL**: Limited to the first 10 years of listing in the Community Register of orphan medicinal products.

⁴ **CHN1**: Lay-out design of integrated circuits.

⁵ **FRA**: Processes directly related to the patents. **GBR**: Processes if patented.

⁶ **BEL**: Limited to the first 11 years. **POL**: Refers to rights from registration of the medicinal and veterinary product with marketing authorisation.

⁷ **CHE**: Software can qualify if patented outside of Switzerland or if it is part of a patented invention in Switzerland. **ESP/ ESP-B/ ESP-N**: Advanced copyrighted software resulting from R&D projects.

⁸ Other patentable inventions (small taxpayers) refers to assets in the spirit of Category III in BEPS Action 5 report (OECD, 2015^[5]), par. 34 and 37.

⁹ **CAN-S**: Trademarks and industrial design rights are excluded from eligibility but can be included to assist in the assessment of the overall strength of the IP in the Canadian market. **CHN1**: Trademarks are excluded from the types of IP that can protect the core technology. Upon qualifying as a HNTE, the reduced tax rate applies to all income from the firm, which may include other forms of IP.

¹⁰ **CHE**: Topographies protected under the Federal Act on Topographies of 9 October 1992; Data protected under the Federal Act on Therapeutic Products of 15 December 2000; Reports protected under an implementing provision of the Federal Act on Agriculture of 29 April 1998 and foreign rights corresponding to the abovementioned comparable rights. **CHN1**: In order to qualify for HNTE status the firm must hold ownership of the IP related to its core technology, which can be protected through one of several different forms of IP marked with an 'x' in this table. Upon qualifying as a HNTE, the reduced tax rate applies to all income from the firm, which may include other forms of IP. **ITA**: Certificates for semiconductors' topographies and two or more intangible assets, amongst those ticked, connected by a bond of complementarity in a product or a product family or a process or a group of processes. **NLD**: IP connected to items, which are so closely connected to qualifying assets that it would require an unrealistically detailed level of administration by the taxpayer to monitor the costs related to the IP. **POL**: Rights related to integrated circuit topography. **USA**: For purposes of section 250, intangible property does not include copyrighted articles as defined in 1.861-18(c) (3).

Source: 2021 KNOWINTAX survey, FHTP peer review questionnaires and public sources.

Table A.3. IP development conditions and implications for eligible acquisition strategies, 2021

Eligible 'x' and potentially eligible '(x)', eligible but restricted 'xr', eligible only subject to development conditions 'd', (i) indicates a note to the data point

| ID | IP development required | Eligible IP, by type of acquisition strategy | | | | Other eligible IP | |
|------------|-------------------------|--|-------------------------|-----------------------|-------------|-------------------|-------------------------|
| | | Self-developed | Outsourcing (unrelated) | Outsourcing (related) | Acquired IP | Existing | Applied not yet granted |
| BEL | x | x | x | d | d | x | x |
| CAN-S | | (x) | (x) | (x) | (x) | (x) | (x) |
| CAN-Q | x | x | xr | xr | d | x | x |
| CHE | x | x | x | d | d | x | |
| CHN1 | | (x) | (x) | (x) | (x) | (x) | (x) |
| CHN2 | | (x) | (x) | (x) | (x) | (x) | (x) |
| CYP | x | x | x | d | d | | x |
| CZE | | (x) | (x) | (x) | (x) | (x) | (x) |
| ESP | x | x | x | d | d | | |
| ESP-B | x | x | x | d | d | x | |
| ESP-N | x | x | x | d | d | | |
| FRA | x | x | x | d | d | x | x |
| GBR | x | x | x | d | d | x | x |
| GRC | x | x | d | d | d | | |
| HUN | x | x | x | d | d | x | |
| IRL | x | x | x | d | d | x | x |
| ISR1 | x | x | xr | xr | d | x | x |
| ISR1-S | x | x | xr | xr | d | x | x |
| ISR2 | x | x | xr | xr | d | x | x |
| ISR2-S | x | x | xr | xr | d | x | x |
| ITA | x | x | x | d | d | | x |
| JPN | | (x) | (x) | (x) | (x) | (x) | (x) |
| KOR | x | x | xr | xr | xr | | |
| LTU | x | x | x | d | d | x | x |
| LUX | x | x | x | d | d | x | x |
| MLT | x | x | x | d | d | | x |
| NLD | x | x | x | d | d | x | x |
| POL | x | x | x | d | d | x | x |
| PRT | x | x | x | d | d | | |
| ROU | | (x) | (x) | (x) | (x) | (x) | (x) |
| SVK | x | x | d | d | d | x | x |
| THA1 | x | x | xr | xr | d | | |
| THA2 | | (x) | (x) | (x) | (x) | (x) | (x) |
| THA3 | | (x) | (x) | (x) | (x) | (x) | (x) |
| TUR1 | x | x | xr | d | d | | |
| TUR2 | x | x | xr | xr | xr | | |
| USA | | (x) | (x) | (x) | (x) | (x) | (x) |
| All | 28 | 37 | 37 | 37 | 37 | 26 | 26 |

Note: Brackets are used to signal that a specific acquisition strategy is not excluded and hence potentially eligible. IP development required refers to regimes that require R&D activities to be performed by the taxpayer for a given IP asset to be eligible for relief. These conditions are different from eligibility conditions that require the performance of R&D activity at the taxpayer level (not linked to any particular asset that are discussed in Table 3). For countries implementing the nexus approach as defined in BEPS Action 5 report, eligible IP by type of acquisition strategy defines qualifying expenditure for the purpose of the regime. If a given IP asset is eligible for relief conditional upon further development by the taxpayer, this is marked as 'd' and this type of expenditure would enter the denominator of the nexus ratio. For countries where acquisition strategies are allowed only within domestic borders this is marked with an 'r'. Existing IP refers to IP rights granted to the taxpayer before the regime was implemented. IP applied, not granted refers to situations where the firm may be eligible for relief since the moment of the application for protection of the IP asset.

Source: 2021 KNOWINTAX survey, FHTP peer review questionnaires and public sources.

Table A.4. Scope of qualifying income, 2021

Eligible 'x' and potentially eligible '(x)', (i) indicates a note to the data point

| ID | Income from royalties and license fees ¹ | Income from exclusive licenses | Income from the sale and transfer of IP rights or to the capital gains ² | Income from in-kind contributions of IP rights ³ | Embedded IP income | Income from the insurance, damages or compensation in relation to the qualifying asset ⁴ | Income from marketing intangibles | Other income not related to IP ⁵ | IP income not defined |
|--------|---|--------------------------------|---|---|--------------------|---|-----------------------------------|---|-----------------------|
| BEL | x | x | x ⁽ⁱ⁾ | x | x | x ⁽ⁱ⁾ | | | |
| CAN-S | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) ⁽ⁱ⁾ | (x) |
| CAN-Q | x | x | | | x | x | | | |
| CHE | x | x | x | | x | x | | | |
| CHN1 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| CHN2 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| CYP | x | x | x | x | x | x | | | |
| CZE | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) ⁽ⁱ⁾ | (x) |
| ESP | x | x | x | | | | | | |
| ESP-B | x | x | | | | | | | |
| ESP-N | x | x | x | | | | | | |
| FRA | x | x | x | | | | | | |
| GBR | x | x | x | x | x | x | | | |
| GRC | | | | | x | | | | |
| HUN | x | x | x ⁽ⁱ⁾ | x ⁽ⁱ⁾ | x | | | | |
| IRL | x | x | | | x | x | | | |
| ISR1 | x | x | | | x | x | | x ⁽ⁱ⁾ | |
| ISR1-S | x | x | | | x | x | | x ⁽ⁱ⁾ | |
| ISR2 | x | x | x | | x | x | | | |
| ISR2-S | x | x | x | | x | x | | | |
| ITA | x | x | x ⁽ⁱ⁾ | x | x | x | | | |
| JPN | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| KOR | x | | x | | | | | | |
| LTU | x | x | x | | | x | | | |
| LUX | x | x | x | x | x | x | | | |
| MLT | x | x | x | x | x | x | | | |
| NLD | x | x | x ⁽ⁱ⁾ | x | x | x | | | |
| POL | x | x | x | | x | x | | | |
| PRT | x | x | x | x | | x | | | |
| ROU | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| SVK | x | x | | | x | | | | |
| THA1 | x | | | | | | | x | |
| THA2 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| THA3 | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| TUR1 | x | | x | | | | | | |
| TUR2 | x | x | x | | x | x | | | |
| USA | (x) ⁽ⁱ⁾ | (x) | (x) | (x) | (x) | (x) | (x) | (x) | (x) |
| All | 36 | 33 | 29 | 18 | 28 | 27 | 9 | 12 | 9 |

Note: Brackets indicates that there is no exhaustive list of qualifying income streams listed in the legislation.

¹ **USA:** FDII only applies to *foreign-derived* Deemed Intangible Income (DII). DII is calculated by subtracting from Deduction Eligible Income (DEI) which is calculated as gross income net of associated expenses (some exclusions apply), a Deemed Tangible Income Return to isolate the contribution of tangible assets. It is possible that DII contains income that is not solely related to IP. To determine the share that is foreign-derived, the ratio of Foreign Derived Deduction Eligible Income (FDDEI) to Deduction Eligible Income (DEI) is derived. FDDEI includes income from the sales of property (intangible and general property) by the taxpayer to a foreign person and for foreign use (FDDEI sales) and income from services provided by the taxpayer to any person not located in the US or with respect to property not located in the US (FDDEI services). Foreign use means use, consumption or disposition which is not within the U.S. Since the categories of income are not defined, all categories are marked as potentially eligible. In principle, any income from IP meeting the FDDEI definitions would qualify. Income from IP could include income from royalties, licenses, income from the sale of IP, exchange, embedded IP income, etc. Income from marketing intangibles is not explicitly excluded.

^{2,3} **BEL:** The firm is obliged to allocate the sums obtained on the occasion of the sale and transfer of IP rights to qualifying expenses relating to other IP rights, within a period of five years counting from the first day of the calendar year of the disposal and at the latest upon cessation of the professional activity. **HUN:** Capital gains are exempt if they arise from the sale or in-kind contribution (a) of notified intangible assets held for over a year; or (b) of intangibles transferred to a tied-up reserve if capital gains are used in the following five years to the constitution of the reserve to purchase intangible assets embodying rights to royalties. **ITA:** Capital gains realised from the sale of the intangible are exempt (excluded from the tax base) provided that at least 90% of the related consideration is re-invested for the maintenance or the development of other intangible assets, before the end of the second tax year following the year of the disposal. **NLD:** Applies to capital gains.

³ **BEL:** Only damages, any income with punitive character does not qualify.

⁴ **CZE:** The regime applies to all types of incomes excluded interest incomes and all incomes subject to withholding tax. **ISR1/ ISR1-S:** These regimes apply to 'preferred income' which is income derived from the manufacturing activity of the preferred enterprise in Israel and it contains: income from selling manufactured products (excludes any income from selling products linked to natural resources), income from granting permission to use know-how or computer software developed by the enterprise, income from services and services connected to know-how or computer software, and income from industrial R&D for a foreign resident. IP income not attributable to manufacturing such as income from marketing intangibles is not considered 'preferred income' and hence not eligible for relief.

Source: 2021 KNOWINTAX survey, FHTP peer review questionnaires and public sources.

Table A.5. Preferential tax rate and full tax rate, 2021

(i) indicates a note to the data point

| ID | Instrument | Exemption rate ¹ | Lowest preferential tax rate ² | Duration (number of years) ³ | Full rate ⁴ |
|--------|-----------------------------------|-----------------------------|---|---|------------------------|
| BEL | Partial Exemption | 85% | 3.75% | | 25% |
| CAN-S | Reduced Rate | | 21% | 10-15 | 27% |
| CAN-Q | Reduced Rate | | 17% | | 26.5% |
| CHE | Partial Exemption | 90% ⁽ⁱ⁾ | 8.11% ⁽ⁱ⁾ (11.39%) | | 19.7% |
| CHN1 | Reduced Rate | | 15% | | 25% |
| CHN2 | Reduced Rate | | 15% | | 25% |
| CYP | Full Exemption (Capital gains) | 100% | 0% | | 12.5% |
| CYP | Partial Exemption | 80% | 2.5% | | 12.5% |
| CZE | Full Exemption | 100% | 0% | 10 | 19% |
| ESP | Partial Exemption | 60% | 10% | | 25% |
| ESP-B | Partial Exemption | 70% | 7.2% | | 24% |
| ESP-N | Partial Exemption | 60% | 10% | | 25% |
| FRA | Reduced Rate | | 10% | | 27.5% ⁽ⁱ⁾ |
| GBR | Reduced Rate | | 10% | | 19% |
| GRC | Full Exemption | 100% ⁽ⁱ⁾ | 0% | 3 ⁽ⁱ⁾ | 22% |
| HUN | Full Exemption (Capital gains) | 100% ⁽ⁱ⁾ | 0% | | 9% |
| HUN | Partial Exemption | 50% | 4.5% | | 9% |
| IRL | Partial Exemption | 50% | 6.25% | | 12.5% |
| ISR1 | Reduced Rate | | 7.5% | | 23% |
| ISR1-S | Reduced Rate | | 5% ⁽ⁱ⁾ | | 23% |
| ISR2 | Reduced Rate (Capital gains) | | 12% ⁽ⁱ⁾ | | 23% |
| ISR2 | Reduced Rate | | 7.5% ⁽ⁱ⁾ | | 23% |
| ISR2-S | Reduced Rate | | 6% ⁽ⁱ⁾ | | 23% |
| ITA | Full Exemption (Capital gains) | 100% ⁽ⁱ⁾ | 0% ⁽ⁱ⁾ | | 27.9% |
| ITA | Partial Exemption | 50% | 13.95% | | 27.9% |
| JPN | Partial Exemption | 20% | 23.79% | 5 | 29.74% |
| KOR | Partial Exemption | 25% | 15% | | 20% ⁽ⁱ⁾ |
| KOR | Partial Exemption (Transfer) | 50% | 12.5% | | 20% ⁽ⁱ⁾ |
| LTU | Reduced Rate | | 5% | | 15% |
| LUX | Partial Exemption | 80% | 5% | | 24.94% |
| MLT | Partial Exemption | 95% | 1.75% | | 35% |
| NLD | Reduced Rate | | 9% | | 25% ⁽ⁱ⁾ |
| POL | Reduced Rate | | 5% | | 19% |
| PRT | Partial Exemption | 50% | 10.5% | | 21% |
| ROU | Reduced Rate | 100% | 0% | 10 | 16% |
| SVK | Partial Exemption | 50% | 10.5% | | 21% |
| THA1 | Reduced Rate | | 3% ⁽ⁱ⁾ | | 20% |
| THA2 | Full Exemption | 100% | 0% | 8 | 20% |
| THA3 | Full Exemption | 100% | 0% | 13-16 ⁽ⁱ⁾ | 20% |
| TUR1 | Full Exemption | 100% | 0% | ⁽ⁱ⁾ | 25% |
| TUR2 | Partial Exemption | 50% | 12.5% | | 25% |
| USA | Tax deduction | 37.5% | 13.13% | | 21% |

Note:

¹**CHE:** As part of the 2020 tax reform, Switzerland introduced a mandatory IP regime as well as an optional R&D super deduction at the cantonal level. The regime applies to the cantonal tax liability and allows a maximum exemption of 90% of qualifying income from cantonal level taxation. The rate of exemption varies by canton and is subject to mandatory general limitation rules of tax relief that cap the amount of relief firms can obtain from the use of tax instruments at the cantonal level. This cap also varies by canton. **CZE:** Other non-tax benefits apply but are out of the scope of this paper. **GRC:** The regime provides for an exemption on the profits from the sale of goods or services comprising the exploitation of a patent for the three consecutive fiscal years after the first year the sale is realised. The exempted profits are recorded in a special reserve and only taxed upon distribution or capitalisation. The legislation establishes no time limit for profits to be in the reserve. **HUN:** Capital gains from the sale or in-kind contribution of a 'notified' intangible held for over a year. A 'notified' intangible is any intangible asset embodying rights to royalties, acquired or produced, provided that the taxpayer notifies the tax authority concerning the acquisition of such assets within sixty days of the date of acquisition or production. Profits from the sale or in-kind contribution of intangibles transferred to a tied-up reserve if used in the following five years to the constitution of the reserve to purchase intangible assets embodying rights to royalties. **ISR1:** 7.5% corresponds to the rate in Development Region A. The corresponding rate in other regions is of 16%. The regime also provides for reduced tax rates on dividend distributions. **ISR1-S:** 5% corresponds to the rate in Development Region A. The corresponding rate in other regions is of 8%. The regime also provides for reduced tax rates on dividend distributions. **ISR2:** 7.5% corresponds to the rate in Development Region A. The corresponding rate in other regions is of 12%. On capital gains, the corresponding rate in other regions is of 12%. The capital gains tax rate (for a company which owns a technology enterprise) for selling an intangible asset (that was acquired after 1 January 2017) to a foreign related company will be 12% as long as the asset was purchased from a foreign company for 200 million ILS or more. The capital gains tax rate mentioned above is contingent upon the approval of the Innovation Authority. The regime also provides for reduced tax rates on dividend distributions. **ISR2-S:** The reduced rate of capital gains is 6% provided that the firm developed or acquired the IP from a foreign company after 1 January 2017 if approved by the National Authority for Technological Innovation. **ITA:** Capital gains realised from the sale of the intangible are excluded from the tax base provided that at least 90% of the related consideration is re-invested for the maintenance or the development of other intangible assets, before the end of the second tax year following the year of the disposal.

²**CHE:** IP income in Switzerland can benefit from a 90% exemption of qualifying IP income from cantonal taxation. However this exemption is subject to a cap: only 70% of a firm's total profits (IP or non-IP) can be exempt. The 8.11% rate applies to qualifying IP income and assumes that the firm has sufficient other income (non-qualifying IP or non-IP income) that is taxed at higher rates so that it is not subject to the 70% maximum relief limitation. If the firm had enough qualifying IP income that the 70% maximum relief limitation did apply, the rate applied to IP income in the city of Zurich would increase steadily to 11.39% (100% IP Income). **THA1:** Reduced CIT rate is 8%, 5% or 3% depending on the amount of operational expenditure of the IBC. 8% for up to THB 60 million, 5% for up to BHT 300 million and 3% for up to BHT 600 million.

³**CAN-S:** Firms can choose when to start their 10-15 year period of reduced taxation. **GRC:** See note in 1. **THA3:** 100% for 8 years extended to 9-13 years depending on the ratio of R&D expenditure to revenues of the first three years combined. If the ratio equals 1% or expenditures incurred are larger than THB 200 million the tax holiday is increased by 1 year. If the ratio equals 2% or expenditures are larger than THB 400 million the tax holiday is increased by 2 years and if the ratio equals 3% or expenditures are larger than THB 600 million, the tax holiday is extended by 3 years. **TUR1:** Sunset provision applies: Exemption from income and corporate tax apply until 31.12.2028.

⁴**FRA:** 26.5% (for companies with less than EUR 250 million taxable profits), 27, 5% (for companies with more than EUR 250 million taxable profits) and 15% (for companies with less than EUR 10 million and on the first EUR 38.120 of taxable profits). **KOR:** The statutory tax rate varies with turnover between 10 and 25%. SMEs are typically taxed between 10% and 20%. **NLD:** The Netherlands also offers a reduced rate of 15% for taxpayers with taxable income less than EUR 245.000 in 2021. As the Dutch IP regime provides a base reduction, i.e. by only including 9/25 of income to taxation, the applicable reduced rate on qualifying IP profits is lower than 9% in those cases.

Source: 2021 KNOWINTAX survey, FHTP peer review questionnaires and public sources.