

OECD REVIEW OF NATIONAL R&D TAX INCENTIVES AND ESTIMATES OF R&D TAX SUBSIDY RATES, 2017

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Abstract

In measuring tax support for R&D, it is important to understand the potential implications of tax relief provisions on the cost of R&D and the associated levels of implied subsidy entitlement. This report provides an overview of the main design features of R&D tax incentives in OECD, EU and other major economies based on data collected through the 2017 OECD-NESTI R&D tax incentive survey. Measures of tax subsidy rates such as those based on the *B-index* provide a convenient proxy measure for examining the implications of tax relief provisions. These provide a synthetic representation of the generosity of a tax system from the perspective of a generic or model type of firm for the marginal unit of R&D expenditure. Implied marginal tax subsidy rates for 2017 are computed and presented for OECD and EU countries and four other major economies, comparing different firm size and profitability scenarios. Where data or proxy measures for the distribution of eligible R&D spending are available, B-index estimates are based on weighted marginal tax credit (allowance) rates that account for the effect of thresholds and ceilings. A comparison of weighted and unweighted B-index estimates highlights the importance of modelling thresholds and ceilings in assessing and comparing implied marginal R&D tax subsidy rates across different firm size scenarios and countries.

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² The contributions of official representatives from OECD countries and partner economies to the 2017 OECD-NESTI R&D tax incentive survey and follow-up data validation exercise are greatly appreciated.

³ This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. The Statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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ABBREVIATIONS

ASC	Alternative Simplified Credit
B&L	Buildings and land
CCPC	Canadian Controlled Private Corporation
CIT	Corporate Income Tax
DB	Declining Balance
GTARD	Government Tax Relief for R&D
HMRC	Her Majesty's Revenue and Customs
HPE	High-Potential Enterprise
IRAP	Imposta regionale sulle attività produttive (regional tax on productive activities)
JEI	<i>Jeune Entreprise Innovante</i> (Young Innovative Company)
JEU	<i>Jeune Entreprise Universitaire</i> (Young University Company)
M&E	Machinery and equipment
PRO	Public Research Organization
PWH(T)	Payroll Withholding (Tax)
RDA	Research and Development Allowance
R&D(&I)	Research and Development (and Innovation)
RRC	Regular Research Credit
SL	Straight Line
SR&ED	Scientific Research and Experimental Development
SSC	Social Security Contributions
S&T(&I)	Science and Technology (and Innovation)
TA	Tax Allowance
TC	Tax Credit
TMT	Tentative Minimum Tax liability
VAT	Value Added Tax
VTC	Vocational Training Contribution
WBSO	Wet bevordering speur- en ontwikkelingswerk (Act for the Stimulation of Research & Development)
YIC	Young Innovative Company

1. Introduction

R&D tax incentives have become a major tool for promoting business R&D in OECD and partner economies. Governments in several countries seek to promote R&D investment in the economy by granting a preferential tax treatment to eligible R&D expenditures, especially those incurred by firms. As of 2017, 30 of the 35 OECD countries, 21 of 28 EU countries and a number of non-OECD economies provide tax relief on R&D expenditures.

This report focuses on providing a structured representation - both qualitative and quantitative - of the qualitative information collected by the OECD on the design of tax relief measures explicitly intended to support R&D by firms. In measuring the incidence and possible impact of R&D tax support on R&D, innovation and economic outcomes, it is important to understand the detailed design of tax support schemes and the implications of tax relief provisions on the user cost of R&D capital and implied subsidy rate. Based on design features that include headline tax rates and allowance or tax credit rates, a number of indicators can be derived and used as a synthetic representation of how generous a tax system is a priori from the perspective of a generic type of firm. This report therefore provides a detailed and structured analysis of qualitative features of R&D tax support schemes which then supports the generation of synthetic indicators, “quantifying” a number of qualitative features of a national tax system in the form of estimates of implied R&D tax subsidy that apply to “model” types of firms. Such indicators have been featured in a number of OECD flagship publications such as the 2015 and 2017 STI Scoreboard (OECD, 2017). Related outputs have been used in a number of OECD studies and country reviews carried out across the OECD.

The focus of this report is entirely descriptive, based on data provided by national authorities to the OECD through the OECD-NESTI data collection on tax incentive support for R&D expenditures carried out in 2017. This data collection, now in its seventh edition, attempts to identify and address subtle differences in the tax treatment of R&D expenditures in firms. National experts on science and technology indicators have collaborated with public finance and tax authorities to provide the most up-to-date information using a common approach towards describing the various features that are relevant to describing the nature and generosity of tax support for R&D.

This report is structured as follows:

- Section 2 provides a summary overview of the main design features of R&D tax incentives and descriptive statistics for OECD, EU and partner countries, based on data collected during the second and third quarters of 2017. This includes an outline of changes in R&D tax relief provisions throughout 2017.
- Section 3 describes how implied R&D tax subsidy rates can be calculated for different business profiles based on qualitative data on the design of R&D tax incentive schemes and general tax system information. This includes an outline of the basic formula, general and country-specific assumptions and additional data feeding in to the calculation.
- Section 4 presents new evidence on the generosity of R&D tax support in OECD, EU and partner economies for 2017. The tax subsidy indicators presented allow for an examination of the distribution of R&D tax subsidy rates across countries by firm size and profit scenario.
- Section 5 concludes with an outline of possible avenues to improve existing R&D tax subsidy indicators and an outlook on future OECD work in this area.

More detailed information is available in the annex section.

This report includes some novel components and informs about subcontracting rules, the treatment of grant-funded R&D projects and aggregation rules. The report complements indicators of the foregone revenues and additional costs incurred by government as a result of provisions for tax-based relief that is specifically targeted towards reducing the cost to firms of R&D efforts, which are discussed in a separate, companion report [D2.3]. The latest indicators and information on R&D tax incentives feature on the OECD website Measuring R&D tax incentives (<http://oe.cd/rdtax>).

2. Design of R&D tax incentives - the situation in 2017

2.1. Scope

Countries differ in the extent to which they rely on tax measures to support R&D, and those that do design tax relief measures in substantially different ways. The diversity of national R&D tax arrangements is a factor hampering cross-country comparisons (OECD, 2014). This document focuses on document tax relief for R&D within the following boundaries:

- Focus on **R&D**: Definitions of R&D or other types of expenditures eligible for tax relief differ across jurisdictions and with respect to the OECD Frascati Manual, although in a number of instances the manual's definitions are part of tax legislation. Definitions of R&D for tax purposes are under continuous evolution and reinterpretation by national tax authorities. This will be discussed in Section 2.2.
- Focus on **business**: This report is concerned with tax relief provided by government for R&D expenditures incurred by tax-paying units in the business sector. The Business enterprise sector is usually the main intended direct recipient of tax relief for R&D. However, provisions may allow relief for R&D expenditures subcontracted to third parties, in other domestic sectors such as higher education or located abroad. These are within the scope of this report and are discussed in section 2.3 and **Annex 2**. Outside the scope of the report are incentives provided outside the business sector, including firms other than incorporated companies. This may include in some cases self-employed individuals.⁴
- Focus on **tax relief from central government**: For practical information collection reasons, only estimates of tax relief at central (or federal) level have been included within this document. Within some federal states like the United States and Canada, state/provincial-level incentives accumulate to federal tax incentives. In those cases, our estimates provide a lower bound representation of total tax support for R&D.
- Focus on relief for **R&D inputs**: Support for R&D through tax incentives can take the form of advantageous tax treatment of innovation inputs (R&D expenditures), as well as preferential treatment of R&D outputs (incomes from licensing or asset disposal attributable to R&D or patents). For the purpose of this report, *Tax incentives for business R&D* are confined to allowances and credits, as well as other forms of advantageous tax treatment of business R&D expenditure. It is more difficult to establish the scope and identify the link to substantive innovative activities in the case of income-based tax incentives, commonly referred to as patent or innovation boxes. To this date, there is significantly less evidence

⁴ Individuals /self-employed are reported to be eligible to claim R&D tax relief in Belgium (R&D investment deduction), Canada (SR&ED tax credit), Denmark (R&D tax credit for deficit-related R&D expenditure), Japan (R&D tax credits), Netherlands (WBSO and RDA), Slovenia (R&D tax allowance), Turkey and the United States (R&D tax credits). In Hungary, private entrepreneurs are eligible to claim R&D tax relief in form of an exemption of social security contributions paid for their employees but not for their own social security contributions.

available on the incidence and impact of income-based vis-à-vis expenditure-based tax incentives – a recent review of this evidence is provided in Appelt et al. (2016).

Based on information provided to OECD by national officials, 30 of the 35 OECD countries, 21 of 28 EU⁵ countries and a number of non-OECD economies give preferential tax treatment to R&D expenditures in 2017 (or closest fiscal year). **Table 1** highlights the geographical scope and the degree of data coverage with respect to the design information collected by OECD.

Table 1. Geographical scope and coverage of R&D tax incentive design information, 2017

	OECD	Non-OECD EU	Other economies
Countries with expenditure-based R&D tax incentives			
Full coverage	AUS, AUT, BEL, CAN, CHL, CZE, DNK, ESP, FRA, GBR, GRC, HUN, IRL, ISL, ITA, JPN, KOR, LVA, NLD, NZL, NOR, POL, PRT, SVK, SVN, SWE, USA	LTU, ROU	BRA, ZAF
Partial coverage	ISR, MEX, TUR	-	ARG, CHN, RUS
No details available	-	MLT	-
Countries with no expenditure-based R&D tax support			
Full coverage	CHE, DEU, FIN, LUX	BGR, CYP	-
Partial coverage	EST	HRV ⁶	-

Notes: This summary table is limited to expenditure-based R&D tax incentives for the business sector and does not cover sub-national or income-based R&D tax incentives. Data coverage based on country responses to the 2017 OECD data collection on tax support for R&D expenditure, targeting 35 OECD, 6 non-OECD EU and 5 other major economies.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, October 2017.

OECD, EU and other partner economies are fully or at least partially covered in terms of R&D tax incentive design information, with the exception of Malta, whose response to the 2017 OECD R&D tax incentive survey is still pending. **Annex 1** summarises the approach adopted by countries towards a range of generic R&D tax incentive design features. Those design features are discussed in detail in the remainder of this section, focussing on R&D tax credits and allowances as well as tax relief redeemable against payroll withholding taxes or social security contributions.

⁵ Compared to previous OECD reports, this includes data for Latvia, as well as the following EU countries: Bulgaria, Croatia, Lithuania, Malta, Romania and Cyprus.

Footnote by Turkey: 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. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Footnote by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

⁶ Croatia did not participate in the 2016 OECD-NESTI R&D tax incentive survey and clarified in the 2017 round of data collection that companies have not been able to (retrospectively) claim support via its former R&D tax support measure (State Aid on Research and Development Projects, 2007-2014) since January 2015. A new R&D tax incentive has not yet been adopted by Croatia at the time of reporting but is planned to be implemented by the Ministry of Economy, Entrepreneurship and Crafts in Croatia in 2018.

While the R&D tax subsidies estimated account for accelerated depreciation provisions for capital R&D expenditure, the cross-country descriptive statistics and tabulations presented here exclude such provisions. Accelerated depreciation schemes are reported to be currently available in 14 countries (Belgium, Brazil, Chile, the People's Republic of China -China henceforth-, Denmark, France, Ireland, Israel, Lithuania, Poland, Romania, Russian Federation, Spain and the United Kingdom). With a 60:30:5:5 percentage distribution of labour, other current, machinery and equipment, and building expenditures across OECD countries (www.oecd.org/sti/rds), these schemes possibly account only for a small fraction of R&D tax incentive benefits overall. Based on the information collected, some of these provisions do not always seem to be entirely R&D-specific and classifiable as a dedicated R&D tax relief measure. Moreover, accelerated depreciation schemes may be combined with an R&D tax credit (e.g. Chile) or allowance scheme and thus not represent a standalone tax relief measure (e.g. United Kingdom). In order to avoid incorrect attribution as R&D tax support or double-counting, further investigation into the nature of these provisions is foreseen within this project.

2.2. The link with R&D

For the purposes of identifying tax relief for R&D, there has to be a well-defined link with policy intentions to grant preferential tax treatment to a range of R&D expenditures. Definitions of R&D or other types of expenditures eligible for tax relief differ across jurisdictions and with respect to the OECD Frascati Manual definition (OECD, 2015) and its explanatory guidance.⁷ However, in cases like Austria, the tax incentive legislation refers explicitly to the Frascati Manual and the Austrian Research Promotion Fund in charge of monitoring the support uses the manual for assessing the R&D content of a project.⁸ A majority of countries explicitly note the existence of the OECD Frascati definition as a general reference or starting point but then go on to explain or qualify distinctive features of R&D for tax relief purposes (e.g. France, United Kingdom). In other cases, no formal definition is provided but the characterisation of R&D in the context of R&D tax support measures largely corresponds to that found in the Frascati Manual (e.g. Belgium).

Table 2 - directly based on responses from countries - suggests that there are instances where the scope of R&D tax relief covers only partially some types or domains of R&D recognised by the Frascati Manual. Basic research is excluded for tax relief purposes in Iceland, Norway and Romania. R&D in the social sciences is excluded in a number of jurisdictions as domain of R&D qualifying for tax relief. In other instances, the scope of R&D tax relief measures is broader than Frascati R&D and extends to other science, technology and innovation activities.

Analysis of responses provided by officials to the OECD questionnaire suggests that there may be differences of appreciation within the OECD definition of R&D and how respondents (e.g. from tax offices, finance or innovation ministries, etc.) characterise the scope of their R&D support schemes in relation to it. One of the key features of R&D as defined by the OECD is that different activities which in some contexts would not be characterised as R&D, might be described and quantified as

⁷ Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge. For an activity to be considered as an R&D activity, it must satisfy five core criteria. The activity must be: novel, creative, uncertain, systematic, transferable and/or reproducible. R&D covers three types of activity: basic research, applied research and experimental development.

⁸ For more information on R&D definitions used by countries for R&D tax incentives, please see the OECD compendium of R&D tax incentive schemes (www.oecd.org/sti/rd-tax-incentives-compendium.pdf).

R&D if they are conducted as part of a project that fulfils the criteria for R&D.⁹ The revised Frascati Manual of 2015, while intended for statistical use, may turn out to be useful to tax practitioners as an additional source of guidance.

Table 2. R&D definition for tax purposes in OECD, EU and other major economies, 2017

Types of R&D		Excluded	No details
Basic research		Iceland (R&D TC), Norway (R&D TC), Romania (R&D TA)	Mexico (R&D TC), New Zealand (R&D TC deficit)
Applied research		-	Mexico (R&D TC), New Zealand (R&D TC deficit), Slovenia (R&D TA)
Experimental development		-	Mexico (R&D TC), New Zealand (R&D TC deficit)
Other eligible activity		Included	No details
Other S&T and innovation activities		Belgium (R&D TA and TC), Brazil (R&D TA), Canada (R&D TC), Chile (R&D TC), China (R&D TA), France (R&D TC, SSC exemption – JEI/JEU), Greece (R&D TA), Korea (R&D TC and TC – investment), Latvia (R&D TA), Netherlands (PWH TC), Norway (R&D TC), Poland (R&D TA), Portugal (R&D TC), Russia (VAT and property tax exemption, R&D TA and SSC exemption), Slovak Republic (R&D TA - volume), Slovenia (R&D TA), South Africa (R&D TA), Spain (R&D TC and SSC exemption), Turkey (R&D TA and SSC exemption), United States (R&D TC)	Hungary (SSC/VTC exemption), New Zealand (R&D TC deficit), Norway (R&D TC), Poland (R&D TA), Romania (R&D TA), Slovak Republic (R&D TA – hybrid and volume), Turkey (R&D TA and SSC exemption).
Domain of R&D		Excluded	No details
Natural sciences and engineering		-	-
Social sciences and humanities		Australia (R&D TC), Canada (R&D TC), China (R&D TA), Iceland (R&D TC), Ireland (R&D TC), Japan (R&D TC: volume, special, incremental and high-intensity), Netherlands (PWH TC), New Zealand (R&D TC deficit), Slovak Republic (R&D TA hybrid and volume), South Africa (R&D TA), Turkey (R&D TA and SSC exemption), United Kingdom (R&D TA - SMEs and TC - large firms), United States (R&D TC)	-

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

2.3. Types of R&D costs

The target of tax relief is often more closely aligned to the financial cost of R&D to the firm (expense), regardless of who carries out the R&D, than the cost of the R&D activity incurred within the firm (i.e. intramural R&D, regardless of who funds the work). R&D carried out internally on own account and R&D expenditure subcontracted to off-site consultants, contractors and other third-parties, tend to be eligible under most R&D tax incentive provisions available in OECD, EU and other major economies (**Table 3**).

Some R&D tax incentive schemes explicitly target specific types of R&D costs. Overall, there is a general preference for considering within the scope of eligible R&D costs those relating to labour and other current expenditures. R&D personnel costs account for the largest share of intramural R&D costs, and the focus on R&D personnel does in principle incentivise investment in human

⁹ The Frascati Manual notes that care must be taken to exclude activities that, although part of the innovation process, do not satisfy the criteria required to be classified as R&D. For example, patent application and licensing activity, market research, manufacturing start-up, and tooling up and redesign for the manufacturing process are not in their own right R&D activities and cannot be assumed to be part of an R&D project. Some activities, such as tooling up, process development, design and prototype construction, may contain an appreciable element of R&D, making it difficult to identify precisely what should or should not be defined as R&D.

resources based in the domestic economy. Acquisition of capital assets to be used for R&D is less typically supported as assets may be subsequently disposed of or used for other purposes. More information on the eligibility status of different types of expenditures for R&D tax relief in OECD countries and other major economies is available in **Annex 2**.

Table 3. Types of eligible R&D expenditure in OECD, EU and other major economies, 2017

Number of schemes with relevant provisions

	OECD	EU-28	All countries
Number of R&D tax incentive provisions	41	28	49
Number of countries	29	20	24
Current R&D expenditure			
R&D labour costs			
Wages and salaries of researchers and other R&D personnel	37	27	44
Subcontracted and collaborative R&D			
Payments for R&D services provided by consultants and other third parties	30	21	37
Payments for other services	12	12	18
Contributions to R&D carried out with 3rd parties (e.g. collaboration agreements)	25	16	29
Other current R&D expenditure			
Materials and other consumables	30	21	37
Overheads	20	13	25
Capital R&D expenditure			
Acquisition of plant and machinery used for R&D	19	15	20
Acquisition of software, licences and IP rights used for R&D	22	20	24
Acquisition of land and buildings used for R&D	14	11	15
Depreciation /amortisation of assets used for R&D	15	12	18

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

The treatment of subcontracted R&D expenditures varies across countries. Eligibility criteria often relate to nature of the contractual relation between contractor and contracted party, the type of R&D service provider and the location where the R&D service is performed. In Canada, the nature of the contract (arm's length principle) determines whether the contract amount represents an allowable SR&ED expenditure of the claimant (payer). In the United Kingdom, large companies may only apply for tax relief on subcontracted expenditures if they are purchased from a recognised organisation (e.g. scientific research organization). Within the European Union, several countries consider subcontracted R&D performed in other member states as eligible R&D expenditure. In some countries, provisions allow the same activity to generate relief for both the entity that carries out the work (if it qualifies as R&D) and the firm that has contracted and paid for it, but in a majority of cases, provisions are in place to avoid such form of “double-dipping”.

Table 4 outlines which countries allow the funder or performer of R&D to claim tax benefits in the case of subcontracting. This summary overview is based on data newly collected by OECD and is subject to further validation by countries. The most common approach is to restrict the eligibility for tax relief to the contracting or purchasing party (funder). A few countries allow the performer of R&D to claim tax benefits (e.g. Belgium and Hungary) or establish a non-double dipping clause that

does not explicitly restrict tax relief to either party (e.g. Austria and Ireland). In only few countries (e.g. Denmark and Turkey) both the performer and the funder may fully or partially benefit from the tax benefits generated in an R&D subcontracting arrangement. **Annex 3** details the terms and conditions under which businesses can claim tax relief in the case of R&D subcontracting, based on countries responses to the 2017 OECD-NESTI data collection.

Table 4. Tax relief eligibility in the case of R&D subcontracting, 2017

Party entitled to claim R&D tax benefits
R&D funder
Australia, Canada, Czech Republic, France, Greece, Iceland, Italy, Japan, Korea, Latvia, Lithuania, New Zealand, Norway, Portugal, Russian Federation, Slovak Republic (if performer is public entity), Slovenia, Spain, United Kingdom (SMEs, large companies if performer is recognized institution), United States
R&D performer
Belgium, Hungary, Netherlands, Romania, United Kingdom (large companies if funder is not subject to UK tax)
R&D funder or performer
Austria, Ireland, Slovak Republic (if performer is private entity)
R&D funder and performer
Denmark, Iceland (if R&D collaboration), Turkey

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Across the surveyed economies, R&D grants and other direct subsidies generally reduce the expense base for calculating R&D tax relief by an amount equivalent to the subsidy received, as highlighted in **Table 5**. However, the treatment of grants can vary depending on the source of funds and by type of tax incentive scheme (see **Annex 4**).

Table 5. Treatment of grant-funded R&D projects, 2017

Direct and tax support for business R&D
Mutually exclusive in their use
Czech Republic, Latvia, Mexico, Poland, United Kingdom (R&D TA)*, United States
Coexist with limitations
Grant funding reduces base of R&D tax credit/allowance
Austria, Canada, France (CIR), Ireland, Lithuania, New Zealand, Portugal**, Slovak Republic, Spain (R&D TC), United Kingdom (R&D TC)*
Grant funding is part of taxable income
Australia, Japan
Ceiling on total support (direct and tax)
Iceland, Norway, Slovak Republic (TA for grant recipients)
Complementary in their use
France (JEI/JEU), Hungary, Portugal*, Sweden, Turkey, United Kingdom (RDEC)**

* United Kingdom: the R&D tax allowance is incompatible with direct funding if it is "state aid" recognised by the European Commission; reduces the tax base for other types of grants and subsidies. In the case of RDEC, there is no reduction for the grant or subsidy.

** Portugal: Support from the European Commission or Portuguese government reduces the tax base; support by 'Measures of Support R&D' under the Portugal 2020 and Horizon 2020 are eligible for relief.

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

In the United Kingdom, SMEs receiving state aid support for R&D cannot use such R&D to claim the enhanced SME R&D tax allowance which is state aid, but may claim the less generous R&D tax credit (RDEC) for large companies. In contrast, R&D expenditures covered by grants and subsidies which do not qualify as state aid can be used to claim tax relief up to a limit. In Sweden, companies can combine the partial exemption of social security contributions with public funding for their own research activities (e.g. from a county council or Vinnova). In France, young innovative enterprises (JEI) and young university enterprises (JEU) can accumulate the JEI/JEU status with the research tax credit (CIR) and other innovation and employment subsidies.

In other countries, direct subsidies and R&D tax incentives are mutually exclusive in their use. In the Czech Republic and Latvia, for instance, direct and indirect sources of funding cannot be combined under the same R&D project. Different rules may also apply depending on the characteristics of the taxpayer or the type of direct subsidy. In the case of Portugal, subsidies from the European Commission or Portuguese government reduce the base for the R&D tax credit, while projects financed under Portugal 2020 and Horizon 2020 are eligible for the SIFIDE II tax credit.

2.4. Types of tax instruments

Tax credits and allowances

Tax relief can take the form of an allowance, exemption, deduction or credit. Tax allowances, exemptions and deductions effectively subtract from the tax base before the tax liability is computed, reducing the taxable amount before assessing the tax. A tax credit is an amount subtracted directly from the tax liability due from the beneficiary unit after the liability has been computed. The choice between credits and allowances is largely a formal one, as they can be converted and made equivalent. However, the value of the tax benefit will react differently to changes in the tax rate, as the value of R&D tax allowances is directly linked to the level of the corporate income tax rate.

Tax base

Tax relief measures can also be distinguished according to whether they are redeemable against corporate income vis-à-vis payroll (e.g. withholding) taxes or social security contributions. Most countries provide corporate income tax offsets (**Table 6**), payroll withholding tax credits and social security exemptions being offered in only seven OECD countries and the Russian Federation as of 2016. Some countries target tax credits (e.g. United States, Mexico as of 2017) to R&D expenditures over and above of a pre-defined baseline amount. The latter type of incentive is commonly described as “incremental”. Some countries offer a hybrid system comprising both a volume and an incremental tax credit (Korea, Portugal and Spain) or allowance (Czech Republic, Slovak Republic).

Table 6. Expenditure-based R&D tax incentives in OECD, EU and other major economies, 2017

Tax relief redeemable against CIT	
R&D tax credit	
Volume-based	Austria, Australia, Belgium (incompatible with TA), Canada, Chile, Denmark, France, Iceland, Ireland, Japan (volume and special R&D), Korea (investment tax credit), New Zealand, Norway, Hungary, United Kingdom (large firms)
Incremental/hybrid	Italy*, Japan, Korea, Mexico, Portugal, Spain, United States
R&D tax allowance	
Volume-based	Belgium, Brazil, China, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovenia, Slovak Republic, South Africa, United Kingdom (SMEs)
Incremental/hybrid	Czech Republic, Slovak Republic, Turkey
Tax relief redeemable against PWH or SSCs	
Belgium (PWH TC), France (SSC exemption – JEI/JEU), Hungary (SSC/UTC exemption), Netherlands (PWH TC), Russian Federation (SSC exemption), Spain (SSC exemption), Sweden (SSC exemption), Turkey (SSC exemption).	

* Companies may offset earned credits against regional taxes (IRAP) and social security contributions, instead of their income tax liability, and carry forward any excess claims (R&D tax benefits are limited to EUR 20 million per year).

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Temporary vs permanent schemes

The use of and impact of tax incentives can be influenced by the temporary or permanent nature of these programmes, as well as by how the business community expect R&D tax support to continue to be provided and under which terms (Appelt et al. 2016). Most R&D tax support schemes initially came into being as temporary measures. Finland, introduced a scheme on a temporary basis over the 2013-14 biennium. The United States introduced the federal research and experimentation (R&E) credit as a temporary measure in 1986, which after 17 extensions became permanent with effect from 2016 (H.R.2029 - Consolidated Appropriations Act, 2016).

Taxability of tax relief

Tax credits represent taxable income in Canada and the United Kingdom (R&D tax credit for large companies) or are effectively taxable (Australia, Chile and the United States) because in order to claim the headline credit rates the taxpayer has to renounce to the deductibility of the R&D expenses that are claimed. As payroll and social security related incentives reduce the expense base and increase the taxable income of businesses, such incentives are effectively taxable as well.

2.5. Provisions for firms with insufficient tax liability

Some countries address the limited incentive effect of standard types of tax relief instruments among firms with low or no profits by providing for the carry-over of tax benefits or even allowing for offsetting payments to be made by the tax authority to the firm for the relevant period.

Carry-over

While carry-over provisions are in place in most OECD and partner economies (**Table 7**), the period of time over which unused tax incentive claims can be carried forward differs notably across countries. Firms can carry over unused claims for three years in the Czech Republic and Poland, for instance, 20 years in the United States, and over an indefinite time horizon in overall eight OECD

countries and two partner economies (Lithuania and South Africa). Furthermore, different provisions may be in place for different schemes within a country. In Belgium, for instance, unused tax credits are carried forward for five years before any excess amounts are made payable to firms. Under the Belgian R&D tax allowance scheme, by contrast, an indefinite carry-forward is available to firms.¹⁰

Refunds

A tax credit becomes “payable” or refundable, as mentioned above, when any credit excess on top of the tax liability can be paid in full or in part to the taxpayer. Refundability can be particularly beneficial for young, innovative firms, at the stage of investing in developing and launching their products. A potential downside of such provisions is that they can also be used by firms with the ability to shift profits to other jurisdictions.

Table 7. Treatment of unused claims in OECD, EU and other major economies, 2017

Carry-forward option	
1-5 years	Belgium (R&D TC), China, Czech Republic, France (large companies), Greece, Korea, Poland, Slovak Republic, Slovenia, Hungary (R&D TA), Russian Federation (R&D TA).
6-10 years	Portugal, Romania, Mexico.
11-20 years	Canada, Hungary (R&D TC), Spain (unreduced, non-payable TC), United States
Indefinite	Australia, Belgium (R&D TA), Chile, Ireland, Italy, Latvia, Lithuania, South Africa, Turkey, United Kingdom
Refund option	
SMEs and large firms	Austria, Belgium (R&D TC after five years), Denmark (deficit), Iceland, Ireland, New Zealand (deficit), Norway, Spain (reduced, payable TC optional), United Kingdom
SMEs only	Australia, Canada (CCPCs), France*
Tax relief redeemable against PWHT or SSCs**	
SMEs and large firms	Belgium (PWH TC), France (SSC exemption – JEI/JEU), Hungary (SSC/VTC exemption), Italy***, Netherlands (PWH TC), Russian Federation (SSC exemption), Spain (SSC exemption), Sweden (SSC exemption), Turkey (SSC exemption)
SMEs only	United States (certain start-ups)****
No Refund or Carry-forward provision	
Brazil, Japan, Russian Federation (VAT and property tax exemptions)	

* The French tax credit provides an immediate refund only for SMEs; large firms obtain a refund of unused credits after three years.

** Tax relief limited to PWHT/SSC liability in corresponding tax period; additional restrictions may apply.

*** Companies may offset earned credits against regional taxes (IRAP) and social security contributions, instead of their income tax liability, and carry forward any excess claims (R&D tax benefits are limited to EUR 20 million per year).

**** Qualified small firms may elect to apply a portion of its research credit against their payroll tax liability, instead of their income tax liability.

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Tax relief redeemable against payroll and related taxes

Tax offsets redeemable against payroll tax or social security contributions provide in general an alternative means to address the limited income tax liability problem. Such incentives, while limited to the payroll tax and social security liability of the corresponding tax period, unless alternative restrictions apply, are disconnected from the corporate tax liability of the firm and thus in principle payable in both the profit and loss-making scenario. In their original design limited to labour costs

¹⁰ In this case, the R&D tax credit and R&D tax allowance are mutually exclusive in their applicability.

for R&D, payroll tax and social security related incentives may be extended to cover other qualifying current or capital expenditure. The Netherlands, for instance, merged its payroll withholding tax credit (WBSO) and R&D tax allowance (RDA) scheme for non-labour related R&D expenditure, providing a broad –based payroll tax offset with effect from 2016.

Related provisions across OECD countries and surveyed economies

While carry-over options are frequently available across OECD and other major economies, only 14 out of the 30 OECD countries that provide tax support for R&D in 2017 offer refundable (payable) or equivalent incentives. **Annex 5** details the terms and conditions under which firms can make use of existing refund options in the event of insufficient tax liability.

Brazil, Japan and the Russian Federation (VAT and property tax exemptions) provide neither a refund nor a carry-forward option to firms with an insufficient tax liability. Denmark and New Zealand offer companies in a tax loss position the possibility to earn a refund for deficit-related R&D expenditures, but this only applies to the standard deductibility of R&D expenses - no extra allowances are involved in those two countries for R&D expenses. In the case of New Zealand, such payments have to be reimbursed to the authorities once the company becomes profitable again.

A number of countries specifically target firms with an insufficient corporate income tax liability that prevents them to fully make use of earned R&D tax credits. In most of such cases, SMEs are exclusive beneficiaries (e.g. Australia, Canada) or enjoy better terms than larger firms (e.g. France, United Kingdom). From 2016, a "deficit-related" refund provision in the United States allows qualified small firms to apply a portion of its research credit against their payroll tax liability, instead of their corporate income tax liability. Payroll tax/social security contribution related incentives are available in seven OECD countries and the Russian Federation. As aforementioned, such incentives increase in principle the predictability of tax support among firms facing uncertainty about their tax profits.

2.6. Limitation of R&D tax benefits

A firm's ability to benefit from R&D tax relief may not only be reduced in the context of insufficient taxable profits but may also arise as a result of additional provisions that authorities include to manage the overall financial burden on the public finances and assure a more equitable distribution of tax benefits. On this basis, several countries introduce different types of thresholds or upper ceilings for eligible R&D volumes or tax benefits. Most countries impose an upper ceiling (**Table 8**) on either the maximum amount of qualifying R&D expenditure or value of R&D tax relief.

Table 8. Limitation of R&D tax relief in OECD, EU and other major economies, 2017

Floors, Base amounts and Ceilings	
R&D tax expenditure	
Floor (min. amount)	Australia, Chile, Hungary (R&D TC), Iceland, Italy
Ceiling (max. amount)	<ul style="list-style-type: none"> • Absolute: Austria (subcontracted R&D), Argentina, Australia, Chile, Denmark (R&D TC deficit), France (R&D TC - subcontracted R&D), Hungary (SSC/VTG exemption), Iceland (subcontracted R&D), Norway, Portugal (incremental tax offset) • Relative: China (subcontracted R&D), Ireland (subcontracted R&D)
Base amount (incremental incentives)	Czech Republic, Italy, Japan (high R&D intensity TC), Korea (hybrid R&D TC), Mexico, Portugal, Slovak Republic (R&D TA - hybrid), Spain, Turkey (R&D TA), United States (Regular Research Credit, Credit for Basic Research, Alternative Simplified Credit)
R&D tax relief*	
Ceiling (max. amount)	<ul style="list-style-type: none"> • Absolute: Belgium (PWH TC), France (SSC exemption – JEI/JEU), Hungary (R&D TA: R&D collaboration), Hungary (SSC/VTG exemption), Italy, Mexico, Netherlands (PWH TC), Russian Federation (SSC exemption), Slovak Republic (R&D TA - volume), Sweden (SSC exemption) • Relative: Hungary (R&D TC), Japan, Korea (large firms), New Zealand (R&D TC deficit), Spain (R&D TC, SSC exemption), Turkey (SSC exemption), United Kingdom (SMEs), United States, Turkey (R&D TA: subcontracted R&D)
Threshold-dependent credit rates	
Canada (CCPCs), France (R&D TC), Netherlands (PWH TC)	
No Thresholds or Ceilings	
Belgium (R&D TC and R&D TA), Brazil, Greece, Korea (R&D TC Investment), Latvia, Lithuania, Poland, Russian Federation (VAT and property tax exemption and R&D TA), Romania, Slovenia, South Africa, United Kingdom (R&D TC large firms)	

* PWHT and SSC offsets limited to PWHT/SSC liability in corresponding tax period; additional restrictions may apply.

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

In some countries, a specific ceiling applies to subcontracted or joint R&D. Ceilings may be defined in absolute monetary or relative terms (e.g. as a percentage of qualifying R&D expenditure or corporate tax liability), typically at company level. Exceptions include the United Kingdom (SME scheme), Slovak Republic and Norway which define R&D tax relief related ceilings at project level. Offsets against payroll withholding taxes and social security contributions, by construction, are limited to the payroll withholding tax or social security contributions liability of the tax period unless additional restrictions (e.g. minimum required level of social security contributions) apply.

Overall, few countries (e.g. Australia and Italy) adopt a floor (minimum threshold) as a means of establishing a minimum level of R&D expenditure that determines tax relief eligibility. Only firms that incur a level of qualified R&D expenditure greater or equal to the floor amount qualify for tax support. Some countries offer incremental tax incentives with a specified base amount, i.e. the baseline level of R&D spending for which the firm cannot claim tax relief. In such cases, only amounts in excess of the base qualify for support, hence their description as “incremental”. Base amounts are typically defined as a function of past R&D expenditure (rolling average over previous *n* years) but alternative specifications have also been adopted. Countries use different base amount definitions and also revise them over time. **Annex 6** provides a summary table with more detailed information on floors, base amounts (definitions), upper ceilings and incentives with threshold-dependent rates, as applicable in OECD and other major economies in 2017.

Threshold-dependent rates imply a discrete reduction in the size of the R&D tax credit or allowance rate once qualified R&D spending surpasses a pre-defined threshold amount. France and the Netherlands offer such incentives aside Canada where enhanced tax credit rates are made available to eligible small companies, the so called Canadian Controlled Corporations (CCPCs), up to a pre-defined threshold amount. In the case of France and the Netherlands, this threshold amount represents a fixed value. In Canada, by contrast, this threshold amount ("expenditure limit") of CAD 3 million is gradually reduced to zero, i.e. fully phased out, as prior-year taxable income rises from CAD 500 000 to CAD 800 000 or as business assets rise from CAD 10 to CAD 50 million.

It is also worth noting that 12 countries report not limiting R&D tax benefits through floors, base amounts, upper ceilings or threshold-dependent rates. In those cases, tax benefits are in principle an increasing function of R&D expenditure and may only be limited by insufficient taxable profits unless immediate refund provisions are in place. Some countries (e.g. Ireland, Spain) set refund-specific ceilings on the value of payable tax benefits (**Table 9**). Ceilings on the amount of R&D expenditure (e.g. Australia and Norway) or tax relief (e.g. United States) may also indirectly limit the amount of refund. No indirect or direct limits are placed on refundable tax benefits in Belgium (R&D Tax credit), Canada (enhanced tax credit for CCPCs) and the United Kingdom (tax credit for large companies).

Table 9. Refund-specific ceilings and discounts in OECD, EU and other major economies, 2017

Ceiling (maximum amount)	
R&D expenditure	Australia, Austria (subcontracted R&D), France (R&D TC – subcontracted R&D), Iceland, Ireland (subcontracted R&D), Norway
R&D tax relief	Italy, United Kingdom (SMEs), United States
Refund amount	Denmark, Ireland, New Zealand, Spain (R&D TC), United States (certain start-ups)
None	Belgium (R&D TC – after five years), Canada (CCPCs), United Kingdom (large companies)
Partial refund or refund at discount	
Partial	Canada ¹¹ (CCPCs above expenditure limit)
At discount	Spain (R&D TC), New Zealand, United Kingdom (R&D TA SMEs)

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Furthermore, the table is confined to countries with corporate income tax offsets that entail a refund option.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

However, the R&D tax credit for Canadian CCPCs is only fully refundable at the enhanced rate of 35% up to the expenditure limit of CAD 3 million. R&D spending in excess of the CAD 3m expenditure limit is eligible for a 15% tax credit that is 40% refundable for CCPCs until the firm exceeds either CAD 500k in prior year taxable income or CAD10m in prior year capital. A refund at a discounted value is also provided by Spain, New Zealand and the United Kingdom. Whereas in Spain a refundable tax credit is available on an optional basis at the expense of a 20% reduction in the value of the tax credit¹², cash payments are to be repaid and corresponding losses to be reinstated in New Zealand (see **Annex 5**). In the United Kingdom, SMEs may claim a payable tax credit of 14.5% on the allowed loss for that period (R&D expenditure qualifying for conversion to credits). This represents a

¹¹ Credits earned by small CCPCs above the expenditure limit are partially refundable (40%). The balance (60%) is not lost, but simply carried forward (20 years) or back (3 years) to offset income in other years.

¹² If the tax payer in Spain selects this option, the general annual limitation of R&D tax benefits (see Annex 6) does not apply but a refund-specific ceiling of EUR 3 million. This ceiling is raised to EUR 5 million when R&D expenses exceed 10% of turnover.

5.85% discount with respect to the 130% tax allowance that can be carried forward (based on a corporate income tax rate of 19%). On this basis, most firms opt for the immediate refund.

While reducing the overall cost of support, the presence of upper ceilings may reduce the incentive effect at the margin among firms with higher levels of R&D. Aggregation rules can play an important role, as some groups may be able to break down their R&D tax support claims across separate enterprises to optimise their tax bill. Aggregation rules for related companies can also matter if there are beneficial terms for SMEs¹³ since, in the absence of such rules, firms may have incentives to offload their R&D to smaller affiliates. In order to ensure that tax support accrues to the intended beneficiaries and to avoid unintended behaviours, tax authorities often impose aggregation and independence rules (e.g. Canada, United Kingdom).

Table 10 shows that countries differ in the extent to which they rely on a joint or separate assessment of the tax benefits of affiliated companies. In Australia, Japan and the United States, for instance, members of consolidated groups act as a single taxpayer for tax purposes. Denmark and New Zealand, which offer tax credits for deficit R&D related expenditure, require the taxable income of the group to be negative in order to qualify for relief.¹⁴ Aggregation rules may also apply in the assessment of cash refunds (Spain, Canada), the application of thresholds (e.g. expenditure limit for CCPCs in Canada¹⁵) and classification of firms as SMEs (e.g. United Kingdom).¹⁶

Table 10. Aggregation rules applicable in determining R&D tax benefits, 2017

Treatment of R&D tax incentive claims of enterprises that are part of a group
Joint assessment of associated parties
Australia (consolidated groups), Canada (associated corporations), Denmark (deficit), Ireland, Japan, New Zealand (deficit), Spain (cash refund), United States
Separate assessment of associated parties
Australia (R&D partnerships), France, Norway, Latvia, Lithuania, Romania, United Kingdom (SME status)
No details available
Austria, Belgium, Czech Republic, Greece, Hungary, Iceland, Italy, Korea, Portugal, Russian Federation, Slovak Republic, Slovenia, Turkey.

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Specific rules establish how associated parties may apply for R&D tax support. In France, the credit is calculated and declared at each level of the consolidated group. The parent company receives the R&D tax credit generated by the group members and can offset the CIT liability of the consolidated

¹³ See also section 2.7 and Annex 8. Definitions of qualified SMEs, start-ups and young firms, 2017 for SME definitions for tax purposes.

¹⁴ In New Zealand individual companies that are part of a group may still be eligible if the group has an overall net loss position. Other requisites apply at the individual level. The firm needs to be resident in NZ, be in a tax loss position in the year, needs to have eligible tax expenditure and sufficient R&D wage intensity. In the case of a firm being part of a group, the R&D wage intensity calculation is based on the entire group's total R&D labour expenditure, divided by the total labour expenditure for the entire group.

¹⁵ In Canada, the applicable ceiling and refundability of the tax credit is a function of the taxable income and taxable capital. For CCPCs with associated enterprises, taxable income is computed for the sum of CCPCs and associated enterprises.

¹⁶ In the case of the United Kingdom, aggregation rules do not affect the distribution of R&D but they are a tool to distinguish which companies are eligible to apply as an SME or large firm due which would ultimately impact the degree of relief.

group. The definition of associated entities also varies across countries but a common element is whether one corporation exercises has directly or indirectly control over the other (see **Annex 7**).

2.7. Targeted relief measures

Although tax incentives are generally seen as the more market-based, non-discretionary alternative to direct support for R&D, a number of countries target R&D tax incentives to particular types of firms, industries or activities. Targeted relief measures may be motivated by evidence or the belief that some groups of firms with observable characteristics, e.g. by firm size or age, can be more responsive to a given unit of financial support.

In this respect, it is important to take into account the differential treatment that some countries assign to certain SMEs or young firms and the specific definitions (see **Annex 8**) that apply to these. In 13 out of 30 OECD countries (**Table 11**), tax provisions imply a more favourable treatment for SMEs and young firms in form of more generous rates of tax support or a refund provision that is exclusively available to these firms. Australia and Canada provide both enhanced tax credit rates and an exclusive refund option to eligible small businesses. In Spain, the R&D&I tax credit and SSC exemption are partially mutually exclusive in their use, except for innovative SMEs, and France has provided an SSC exemption explicitly for young innovative enterprises (JEI) since 2004, extended to young university enterprises (JEU) in 2008.

Table 11. Preferential tax treatment of SMEs and young firms, 2017

	SMEs	Start-ups and Young firms
Enhanced tax credit/allowance rates	Norway, Japan (volume-based R&D TC), Korea, United Kingdom (R&D TA – SMEs)	Netherlands, Portugal
Exclusive refund of excess claims	France (R&D TC)	United States (certain start-ups)
Enhanced tax credit/allowance rates and exclusive refund of excess claims	Australia, Canada (CCPCs)	-
Other favourable terms	Spain (innovative SMEs), United States (qualified small business)	Belgium (PWH TC: young innovative firms), France (SSC exemption – JEI/JEU)

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Furthermore, the table is confined to countries that provide a preferential tax treatment for certain SMEs or young firms within the realms of their R&D tax incentive provisions.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

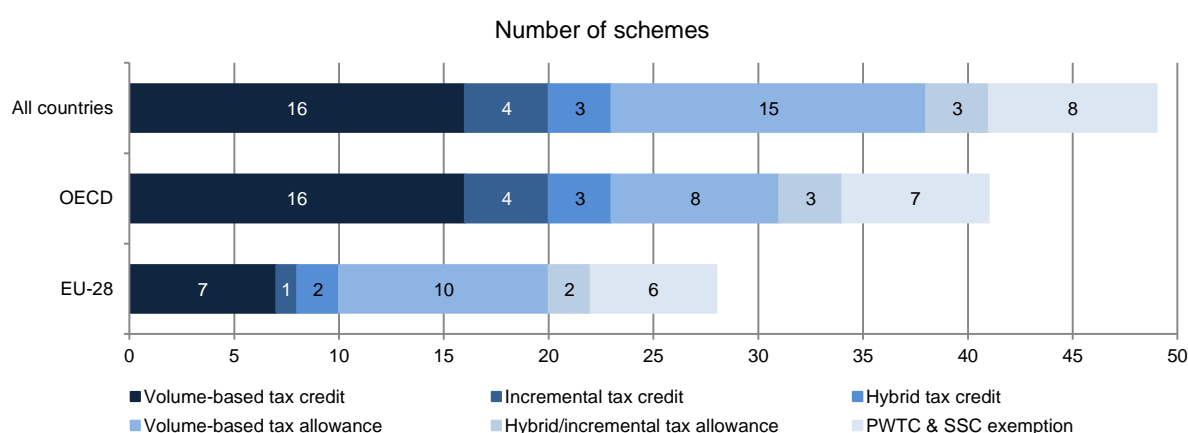
Countries may also target collaborative forms of R&D or basic research on the basis that incentives to carry out such forms of R&D with high “spillover” potential are most likely lower than for other types of R&D. Currently, only few countries explicitly incentivise collaborative forms of R&D or basic research. This includes Belgium, France, Hungary, Iceland and Japan (see **Annex 1**).

2.8. Summary overview and recent changes

Figure 1 depicts the distribution of different types of tax incentive arrangements across countries, and the OECD and EU region more specifically. In 2017, most OECD and other surveyed economies providing tax incentives for R&D use either a tax credit (e.g. Australia, Canada, France, Ireland, Netherlands, Norway) or tax allowance (e.g. Brazil, China, United Kingdom) that is applicable on the

volume of R&D expenditure undertaken. A similar pattern can be found for EU countries, where volume-based tax incentives are most prevalent. However, R&D tax allowances outnumber volume-based R&D tax credits in terms of frequency of adoption in the EU-28 area as of 2017.

Figure 1. Types of tax relief schemes used in OECD, EU and other major economies, 2017



Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. VAT and property tax exemptions in the Russian Federation feature as volume-based tax allowances for classification purposes. No details available for Argentina, Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Figure 2 provides a summary overview of the distribution of some of the main design features discussed in this section. The country-scheme level statistics highlight that tax incentives with carry-over provisions are comparatively more frequent than “payable” tax incentives (including tax relief measures redeemable against payroll withholding taxes or social security options).

Focusing on corporate income tax offsets alone, around one third of surveyed schemes in the OECD and EU area provide firms with insufficient tax liability with a refund option, whereas around seven out of ten tax relief measures allow for a carry-over of unused credits. Of those schemes with a carry forward option, more than half (63%) have a limited rather than indefinite time frame over which unused credits can be carried-forward and used in the future, ranging from 3 to 20 years (**Table 7**).

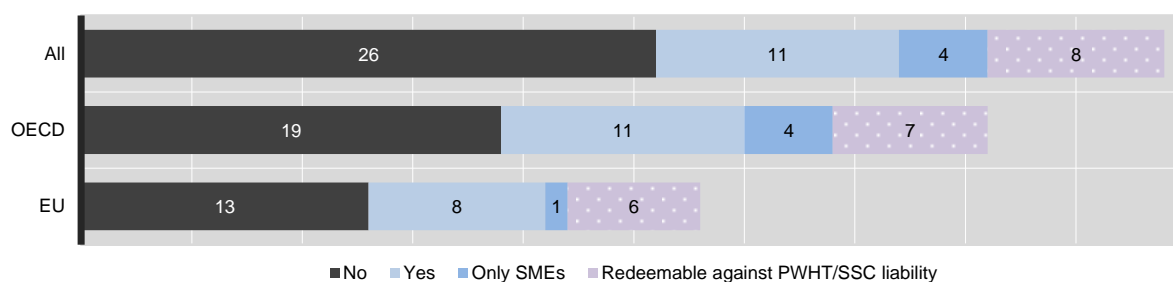
The benefits of most R&D tax relief measures are limited through some form of threshold or upper ceiling on the amount of R&D expenditure or value of R&D tax relief. This is the case for 8 out of 10 schemes in the OECD area and 7 out of 10 schemes in the EU area. Only 33% of all surveyed schemes (37% in the OECD and 29% in the EU) provide a preferential tax treatment for SMEs, young firms or start-ups in form of enhanced tax credit or allowances rates or other more favourable terms. A majority of them offer more generous tax credit or allowance rates to such firms, but a few also provide exclusive or preferential refund options.

Over the last decade, many countries have tried to increase the availability, simplicity of use and generosity of R&D tax incentives. More countries currently rely on tax support to encourage business R&D than a decade ago. New Zealand, for example, reintroduced R&D tax relief in form of a tax credit for research and development tax losses and Japan complemented its R&D tax credit regime with a new special tax credit for collaborative R&D. Furthermore, many countries have been progressively replacing relatively complex incremental/hybrid tax incentives with simpler and more generous volume-based tax incentives, such as France in 2008, Australia in 2011 and Ireland in 2015.

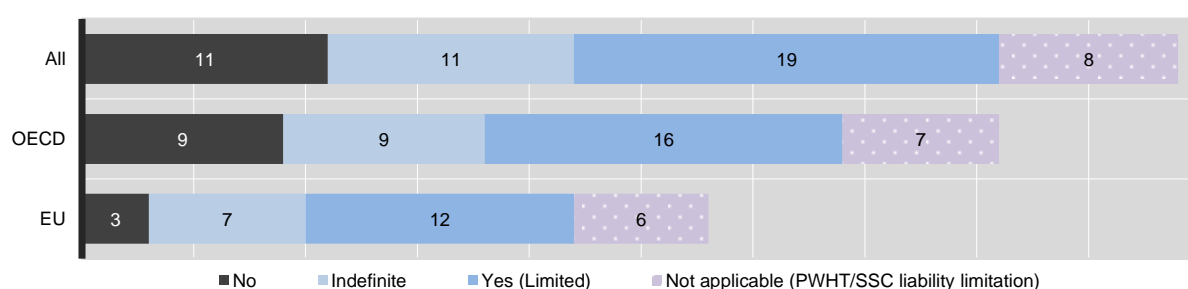
Figure 2. Design of R&D tax incentive relief across OECD, EU and other major economies, 2017

Number of schemes subject to relevant provisions

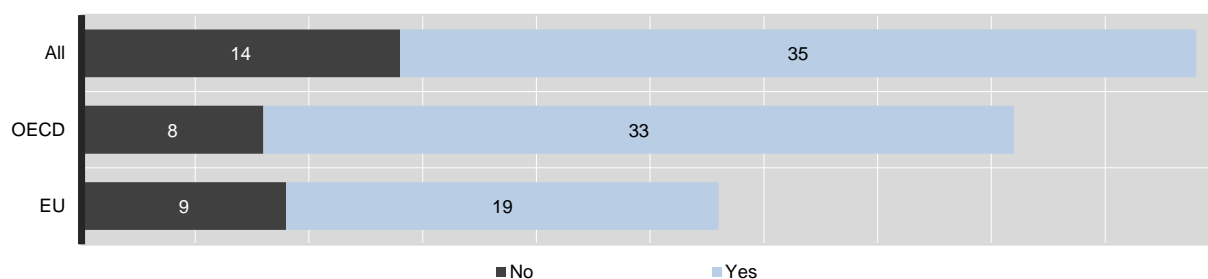
1. Refundability of unused credits (payable credit)



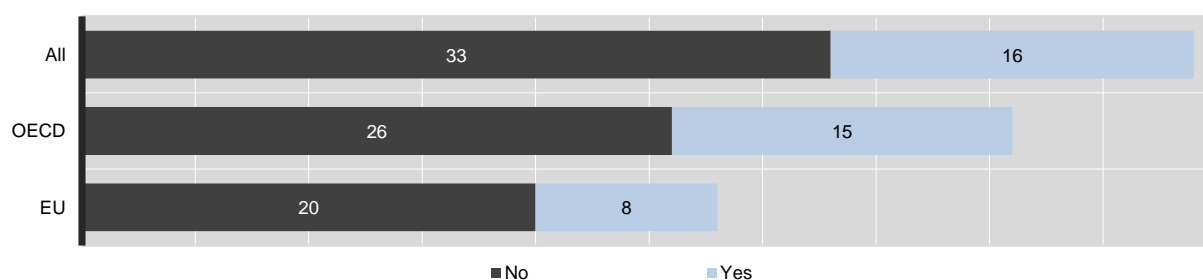
2. Carry-over provision



3. Thresholds and ceilings



4. Preferential treatment of SMEs/young firms/start-ups



Notes: i. These summary charts are limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel.

ii. Tax incentives with R&D expenditure floors, threshold-dependent rates, base amounts or ceilings on the maximum amount of R&D expenditure, value of R&D tax relief or refundable amount (payable credit), are classified as schemes with "Thresholds and ceilings". This includes PWHT and SSC exemptions, limited to the payroll withholding tax/social security contribution liability of the corresponding tax period (additional restrictions may apply).

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Across OECD countries and other surveyed economies, regular reforms of R&D tax incentives have led to a continuous change in the scope and generosity of R&D tax relief measures over time. Such reforms relate to the R&D definition adopted for tax purposes, changes in tax credit and allowance rates, adjustments of thresholds or upper ceilings on qualifying R&D expenditure or tax relief amounts, or changes in the terms and availability of refunds.

Table 12 summarises a number of such reforms, covering the most recent changes in R&D tax incentive provisions that took effect in 2017. This includes:

- Changes in the availability of R&D tax incentives such as:
 - Introduction of a new R&D tax relief measure (Mexico);
 - Streamlining of R&D tax incentive system: non-extension of one tax credit (Japan);
- Increases in R&D tax credit and allowance rates (China, Japan and Poland);
- Reductions in R&D tax credit or allowance rates (Hungary and Korea).
- Increases in the ceiling for R&D tax relief (Japan and Norway).
- Reduction of the number of years the claim can be carried forward (Russian Federation).
- New administration process for collaborative projects introduced (Hungary).

Table 12. Changes in main design features of R&D tax incentives in selected OECD countries, 2017

R&D tax credit/enhanced R&D tax allowances rates			
Change	Country	Incentive	Description
Increased	China	R&D TA	Preferential tax allowance rate for SMEs as of 2017. The volume-based rate of the R&D TA increases from 50% in 2016 to 75% in 2017.
	Japan	R&D TC (volume)	Temporary measure (until FY2018): the rate of the volume-based tax credit amounts to 6-14% (previously 8-10%) for large companies and 12-17% for SMEs (previously 12%) according to the percentage change in R&D expenditures relative to the past 3 year average.
	Poland	R&D TA	The R&D tax allowance rate for R&D labour expenditure increases from 30% in 2016 to 50% in 2017, and the allowance rate for qualifying, non-labour related expenditure is lifted from 10% (20%) in 2016 to 30% (50%) in the case of large (small) companies.
Reduced	Korea	R&D TC	Incremental R&D tax credit rate for large firms reduced from 40% to 30%.
	Hungary	SSC exemption	The SSC rates were reduced from 28.5% in 2016 to 23.5% in 2017. The rate for PhD students or doctoral candidates changed from 14.5% to 11%.
Threshold/ceiling on amount of eligible R&D expenditure or value of R&D tax relief			
Threshold removed or redefined	Russian Federation	R&D TA	50% of operating losses attributable to a super deduction may be carried forward to the next period (previously 10 year carry-forward), but are not refundable if the losses cannot be utilized.
Ceiling increased	Japan	R&D TC (volume)	Temporary measure (until FY2018): the volume-based tax credit limitation may be increased by up to 10 percentage points from 25% to 35% if i. the High R&D intensity-based R&D tax credit is not used, and ii. the ratio of current R&D expenditure to 3-year average turnover is larger than 10% (large firms); the percentage increase in R&D expenditure is larger than 5% (SMEs).
	Norway	R&D TC SKATTEFUNN	Cap on intramural R&D expenditure increased from NOK 20m to NOK 25m and cap on R&D purchased from approved R&D institutions increased from NOK 40m to NOK 50m. Cap on total R&D expenditure (intramural + extramural) increased from NOK 40m to NOK 50m.
Availability of R&D tax incentive schemes			
Introduction	Mexico	R&D TC	Incremental R&D tax credit introduced at a rate of 30% for eligible expenditures in excess of the average R&D spending in the previous 3 years.
Extension	Japan	R&D TC (high R&D intensity)	Extension of high R&D intensity tax credit for two years (until FY2018: 31 March 2019).
Removal	Japan	R&D TC (incremental)	The incremental R&D tax credit was abolished with effect of 1 April 2017.
Expansion	Japan	R&D TCs	Expansion of the type of eligible costs for tax credits to include R&D costs for the development of services (businesses using IT, big data, artificial intelligence, etc.) with effect of 1 April 2017.
Modification of terms	Hungary	R&D TA	New administration process: After 2017 HIPO's qualification of R&D projects can be requested by group of projects, not only individually

Notes: This summary table presents country-scheme level information based on country responses to the 2017 OECD data collection on tax support for R&D expenditure. The table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Argentina, Malta and Israel. Recent changes in the main design features of R&D tax incentive provisions apply with effect from 2017.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

In addition to changes introduced with effect from 2017, it is note to note that some countries haven taken policy actions that are due to take effect in 2018. The R&D tax allowance in Latvia will cease to apply from January 2018. Several countries have undertaken in depth reviews and consultations that included within their scope the operational procedures used in the process for awarding tax relief for R&D. Evidence on such procedures will be discussed in future OECD work.

3. Estimation of implied R&D tax subsidy rates

3.1. Methodology - the B-index

The generosity of R&D tax incentives is related to both the design of tax relief measures as well as business characteristics. One approach to measure the potential incentive effect of tax relief for R&D is to consider a hypothetical firm with given characteristics and examine the expected impact of the provisions (e.g. tax credit/allowance rate and availability of refund and carry-over provisions) on the after tax cost of R&D for the marginal unit of spend on R&D.

General formula

The B-index specifies the pre-tax income needed for a “representative” company to break even on a marginal, monetary unit of R&D outlay (OECD, 2013; Warda, 2001), taking into account provisions in the tax system that allow for an enhanced treatment of R&D expenditures. A “representative firm” is typically defined for convenience as one with sufficiently large profits to be able to fully make use of earned tax credits in the reporting period. It is customary to present this indicator in the form of an implied subsidy rate, namely *one* minus the *B index*. More generous provisions imply a lower “breakeven” point and therefore a higher subsidy. The *B index* is defined, in the case of a “representative” firm with sufficiently large profits and only current R&D expenditures¹⁷, as:

$$B \text{ index} \equiv \frac{1-A}{1-\tau}.$$

In this expression, τ is the corporate tax rate and A is the combined net present value of allowances and credits applying to the marginal R&D outlay. For example, in the case of a θ allowance rate on R&D (deduction from taxable profits), it is defined as: $A = \tau \cdot \theta$. When $\theta = 1$, current expenditures are fully (100%) deductible but no enhanced incentive is provided, the benchmark scenario in most countries, *B index* = 1 and the subsidy rate is zero.¹⁸

Annex 9 specifies the design and tax system parameters feeding into the B-index estimation for 2016, including targeted tax relief provisions (e.g. enhanced tax credit rates) for SME vs. large firms.

¹⁷ This assumption is only made for illustrative purposes. This general framework has been adapted to account for R&D capital expenditures or specific types of eligible current expenditures. Across the OECD, current expenditures account on average for 90% of R&D expenditures and hence capital provisions account for a very minor component of the final estimate.

¹⁸ While current expenditures are typically fully deductible, capital expenditures are depreciated over their useful life in most countries. Unless there is an immediate write-off, the net present value of capital allowances is smaller than one and the B-index is larger than one (negative tax subsidy rate) when capital expenditures are included in the benchmark scenario (no enhanced tax incentives are provided).

Relationship to related measures of tax subsidy

Another possible interpretation of the B-index relates to the **user cost of R&D capital** faced by firms. Under some conditions,¹⁹ it can be shown that:

$$u + \delta = (B \text{ index}) \cdot (r + \delta),$$

where u is the cost of capital for a marginal investment in R&D which only increases the stock of R&D capital in one period, financed by retained earnings, r is the real interest rate and δ is the rate of economic obsolescence for the stock of R&D capital.²⁰ In other words, the *B index* can be interpreted as the tax-based adjustment to the minimum pre-tax rate of return on an investment required by an investor.

Effective marginal tax rates (EMTR) are calculated as the difference between the before-tax real rate of net return of economic depreciation required on a marginal project (u) and the real rate of return after taxes required by the investor (r). Dividing the difference by the before-tax rate of return yields the EMTR.

$$EMTR = \frac{u - r}{u}$$

B-index and EMTR therefore yield identical qualitative results (Warda, 2001) as the EMTR increases monotonically with the B index. In other words, as the tax subsidy becomes larger, firms experience a lower user cost of R&D capital and a lower marginal effective tax rate.

3.2. Modelling R&D tax benefit limitations

Insufficient tax liability scenarios

To provide a more accurate representation of different, relevant, scenarios, B-indices have been calculated for “representative” firms according to whether they can claim tax benefits against their tax liability in the reporting period. When credits or allowances are fully refundable, the B-index of a firm in such a position is identical to the profit scenario. Carry-forwards are modelled as discounted options to claim incentives in the future.

The adverse economic climate experienced by some countries in the aftermath of the global economic and financial crisis has dented the profitability of many companies, particularly in the early phase of the global economic crisis where operating surplus has been negative in many countries’ corporate sector. This calls into question the relevance of the headline *B index* or related measures as a representative indicator for all R&D-performing companies, especially R&D start-ups. In recognition of the fact that there are significant differences in the provisions made by countries for scenarios in which companies cannot immediately realise the entire value of tax incentives on R&D, the B-index formula has been generalised as follows:

$$B \text{ index} \equiv \frac{1 - \tau \cdot (x + (1-x) \cdot \psi) \cdot \theta}{1 - \tau \cdot (x + (1-x) \cdot \psi)},$$

¹⁹The simplified version of the B-index abstracts from issues concerning the tax treatment of alternative finance sources of R&D, provisions on the taxation of R&D outputs and the asset-like nature of R&D knowledge, including its actual economic obsolescence and that of its capital components.

²⁰The user cost is derived by imposing that the economic rent from such an investment is zero at the margin. The company boosts its R&D investment in period t and undertakes a downward correction in $t+1$. This shifts profits in period t (higher losses), $t+1$ (increased revenues from higher stock, lower R&D).

In this formula, x denotes whether the firm has a sufficiently large profit to claim the incentives ($x = 1$ if so, $x = 0$ otherwise). ψ is the net present value adjustment factor for the allowance (or equivalent incentive) in the scenario with an insufficiently large profit base (“loss making” for brevity). $\psi = 1$ if the incentive is fully and immediately refundable in the “loss” case and $0 < \psi < 1$ if the incentive can be carried forward.²¹ The value of ψ has been modelled, using some additional, simplifying assumptions, to reflect the terms of carry-forward provisions as well as instances when refunds are postponed for a given number of years if not previously used.

A firm with low or negative profits faces an implicit lower tax rate $\hat{\tau} = \tau \cdot \psi$ through which to realise the incentives theoretically available. For this reason, when $\theta > 1$, i.e. when the tax system subsidises R&D, $B \text{ index}(\text{loss}) > B \text{ index}(\text{profit})$ and the subsidy rate is lower for loss than for profit making firms. In the opposite case, when $\theta < 1$ (e.g. where no incentives are provided and R&D capital costs cannot be immediately amortised), a net tax is in place and the breakeven point is thus higher in the profit-making case $B \text{ index}(\text{loss}) < B \text{ index}(\text{profit})$. In the case where authorities apply different carry forward provisions to general losses and special allowances and credits, the following formulation has been derived:

$$B \text{ index} \equiv \frac{1 - \tau \cdot \left[x \cdot \theta + (1 - x) \cdot \psi_{\infty} \cdot \left(1 + \frac{(\theta - 1) \cdot \psi_T}{\psi_{\infty}} \right) \right]}{1 - \tau \cdot (x + (1 - x) \cdot \psi_{\infty})}$$

where ψ_{∞} is the expected net present value of a unit of loss which can be carried forward indefinitely, and ψ_T is the net present value that reflects a time limit T for carrying forward special credits and allowances.

Thresholds and ceilings

Incremental R&D tax incentives have been modelled considering the impact that current decisions have on future baseline R&D levels. This is formally equivalent to implementing adjustments to the credit or allowance rates, a correction that also needs to be made when modelling the provisions in countries that treat credits as taxable income. The net present value of an incremental tax credit provided at rate c on qualifying R&D expenditure in excess the base amount (average R&D expenditure in the previous n years), can be derived as follows:

$$\text{NPV Incremental Tax credit} = c \cdot \left(1 - \frac{1}{n \cdot r} (1 - (1 + r)^{-n}) \right).$$

The formula for incremental tax allowances can be derived analogously. For companies with planned declining R&D profiles over time, the modelled B index may overstate the level of incentive as these firms are unlikely to qualify for the incremental component of the incentive, as the formula assumes that the marginal outlay qualifies for the incentive.

Marginal tax credit rates reflect the magnitude of marginal tax credit rates applicable to an extra unit of R&D spend across a segment of the business population (e.g. SMEs or large enterprises). Whenever caps and thresholds apply to eligible R&D expenditure or the amount of R&D tax relief, an

²¹ The NPV of an allowance carried forward is $\psi(T, \lambda, i) := [1 - \left(\frac{\lambda}{1+i}\right)^T] \left(\frac{\lambda}{1+i}\right) / (1 - \left(\frac{\lambda}{1+i}\right))$ in the case of a constant probability λ of returning to profit (arbitrarily set to 50%), and interest rate i (10% in line with the literature). It can be noted that $\psi(T, \lambda, i) < \psi(\infty, \lambda, i)$. This formula has been adapted to the case of specific countries which allow a full refund of outstanding credits at the end of the period.

attempt was made to compute weighted marginal tax credit (allowance) rates for SMEs and large firms, using available data or proxy measures for the distribution of eligible R&D spending. In the presence of thresholds and upper ceilings for relief, the marginal unit of expenditure will lie at different points in relation to such thresholds for different firms. Whenever the information available makes it possible, these are estimated as a weighted average of marginal rates across the relevant group. This is the case for Australia, Canada, Chile, France, Hungary, Norway, Portugal and the United States (see **Annex 10** for notes on the calculation of the B-index for these countries).

For reasons such as thresholds, marginal subsidy rates will also differ from the average subsidy rate that is relevant for firms, especially multinationals, deciding whether to invest in discrete amounts of R&D in a given country. Different measures can be relevant for different types of R&D investment decisions: the average at the extensive margin (whether to invest in a country), the marginal one at the intensive margin (how much to invest within a country at the margin). It is a well-established fact in the literature that B-indices or effective marginal tax rates are not adequate for analysing discrete or lumpy investment decisions. Devereux and Griffith (1998, 2003) and argue that the effective average tax rate (EATR) is most relevant when considering location decisions of firms and other extensive investment margins or choices. An EATR measures the discrete cost of capital associated with investing in a specific jurisdiction relative to not doing so.

4. Generosity of R&D tax support in 2017

Figure 3 presents the notional levels of tax support (before tax) per additional unit of R&D to which firms with defined characteristics are in principle entitled in 2017. In the case of SMEs, this level is highest for France, Portugal and Chile in the profit-making scenario (Panel 3A) and France, the Netherlands and Portugal in the loss-making (Panel 3B) case (insufficient tax liability). The gap in the implied R&D tax subsidy rates for SMEs between France, Portugal and Chile is significantly more pronounced in the loss-making scenario. Refunds and carry-forward provisions are sometimes used to promote R&D in firms that may not otherwise use their credits or allowances. Such provisions can be exclusively available to or more generous for SMEs and young firms as opposed to large enterprises. This is the case for France as well as Australia and Canada. In the Netherlands, tax offsets are redeemable against payroll taxes and disconnected from the corporate tax liability of the firm. The implied marginal R&D tax subsidy rates for profitable and loss-making firms thus coincide.

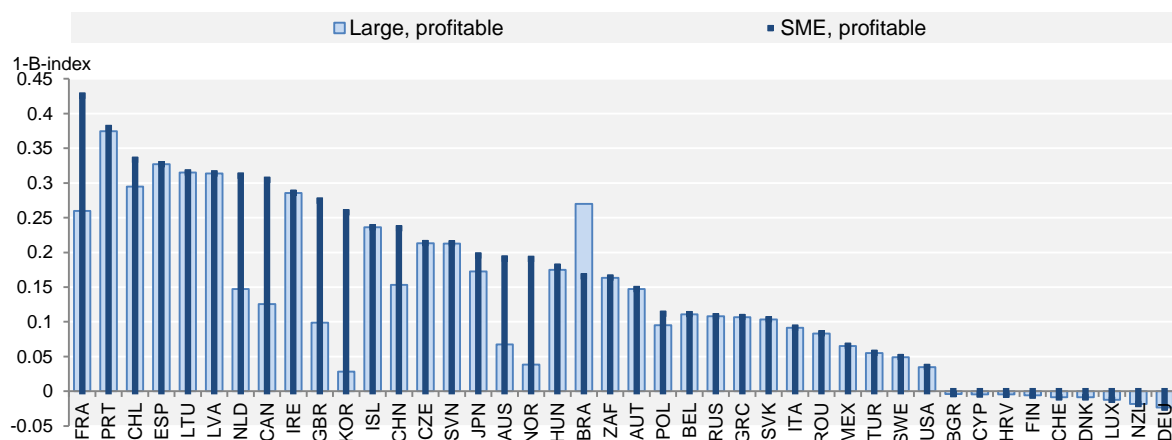
In countries where R&D tax incentives entail neither a carry-over nor refund option (Brazil and Japan), loss-making firms experience a full loss of tax benefits (Panel 3C). Large firms receive the highest (lowest) tax subsidy rate in Portugal and Spain (New Zealand and Germany) in the profit and loss-making scenario. Overall, there is large variation in tax subsidy rates across countries.

Table 13 summarizes the tax subsidy estimates for 2017, highlighting (unweighted) average and median R&D tax subsidy rates by firm size and profit scenario across countries, and for the OECD and EU regions. The estimated R&D tax subsidy rates suggest that large companies tend to benefit from a similar level of R&D tax support in the OECD and EU area. The mean (median) R&D tax subsidy rate for large profitable companies is estimated at 0.13 (0.10) for OECD and 0.13 (0.11) for EU countries. This compares with a mean (median) R&D tax subsidy rate for large loss-making companies of 0.10 (0.08) in OECD and 0.11 (0.10) in EU countries.

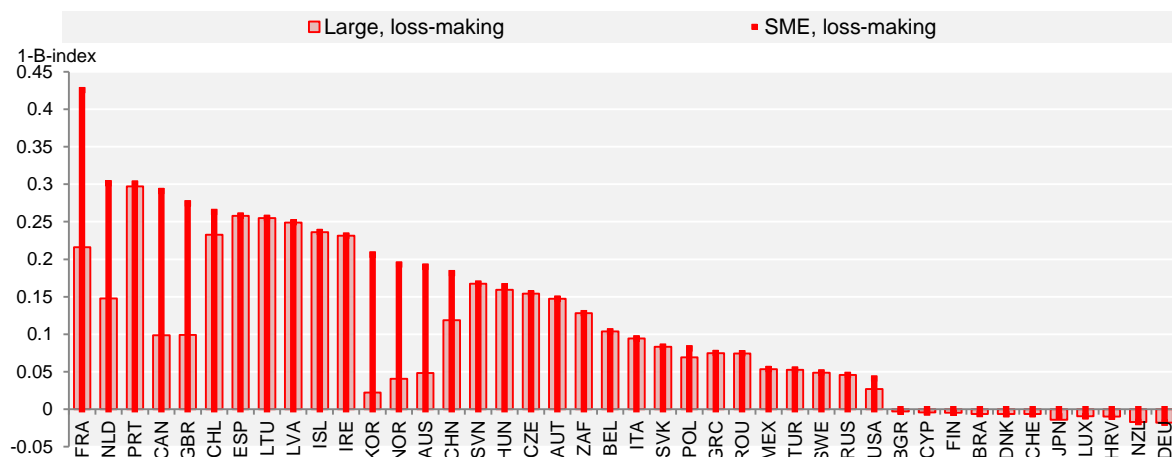
Figure 3. Implied tax subsidy rates on R&D expenditures, 2017

1-B-Index, by firm size and profit scenario

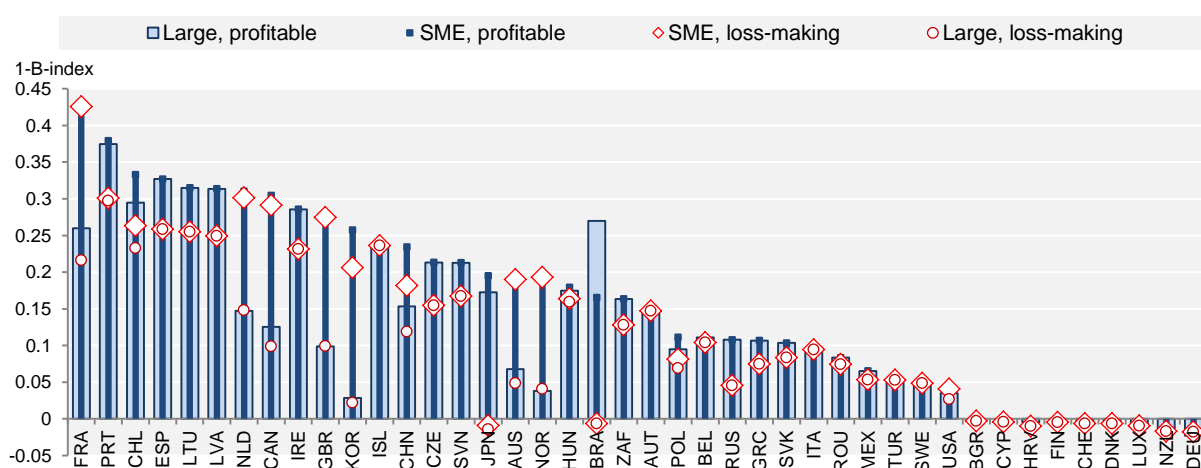
Panel 3A. Profit-making scenario



Panel 3B. Loss-making scenario



Panel 3C. Profit and Loss-making scenario combined



Note: Figures reflect the tax treatment of R&D expenditure for SMEs and large enterprises in OECD, EU and other major economies, some countries of which but not all, offer tax incentive support for business R&D expenditure. No estimates are available for Argentina, Estonia, Israel and Malta. Figures do not reflect preferential provisions for start-ups, young firms or a specific subset of SMEs (e.g. innovative SMEs).

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, March 2018.

Table 13. Mean and median tax subsidy rates on R&D expenditures, 2017

1-B-Index, by firm size and profit scenario

	Mean				Median			
	Profit		Loss		Profit		Loss	
	Large	SME	Large	SME	Large	SME	Large	SME
OECD	0.13	0.16	0.10	0.14	0.10	0.18	0.08	0.15
EU	0.13	0.15	0.11	0.13	0.11	0.11	0.10	0.10
All countries	0.12	0.15	0.09	0.13	0.11	0.16	0.07	0.10

Note: Figures reflect the tax treatment of R&D expenditure for SMEs and large enterprises in OECD, EU and other major economies, some countries of which but not all, offer tax incentive support for business R&D expenditure. No estimates are available for Argentina, Estonia, Israel and Malta. Figures do not reflect preferential provisions for start-ups, young firms or a specific subset of SMEs (e.g. innovative SMEs). Mean values reflect unweighted average R&D tax subsidy rates.

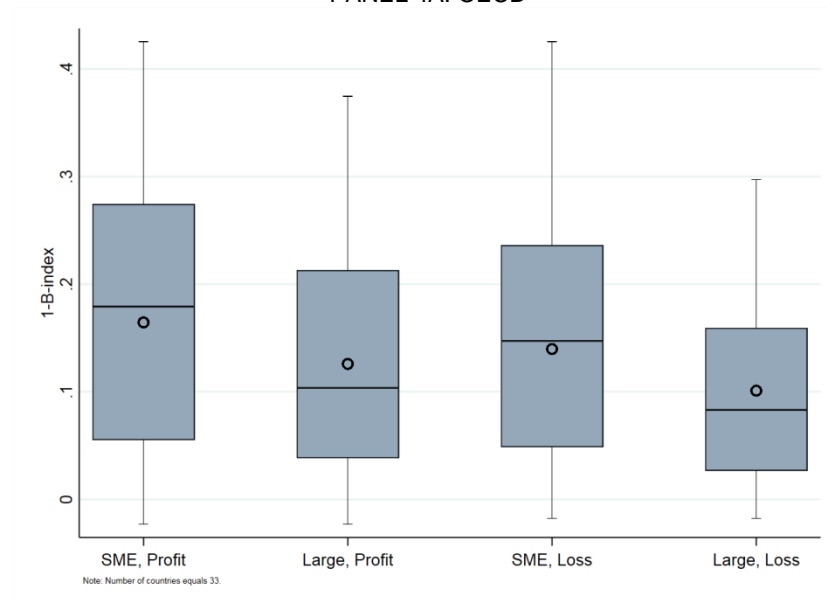
Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, March 2018

A somewhat different result applies to SMEs, where mean tax subsidy rates for profitable (loss-making) SMEs imply a similar level of tax support of 0.16 (0.14) in OECD and of 0.15 (0.13) in EU countries. However, median²² tax subsidy rates for SMEs are lower for EU vis-à-vis OECD countries in both the profit and loss-making scenario. For the OECD area, the median tax subsidy rate is estimated at 0.18 and 0.15 for profitable and loss-making SMEs respectively. This compares with median tax subsidy rates of 0.11 and 0.10 for profitable and loss-making SMEs in the EU region. OECD countries (**Table 11**) tend to more frequently offer a more favourable tax treatment for SMEs vs. large companies compared to EU countries. **Figure 4** presents the distribution of implied R&D tax subsidy rates in OECD (Panel 4A) and EU (Panel 4B) countries.

Figure 4. Distribution of implied tax subsidy rates on R&D expenditures, 2017

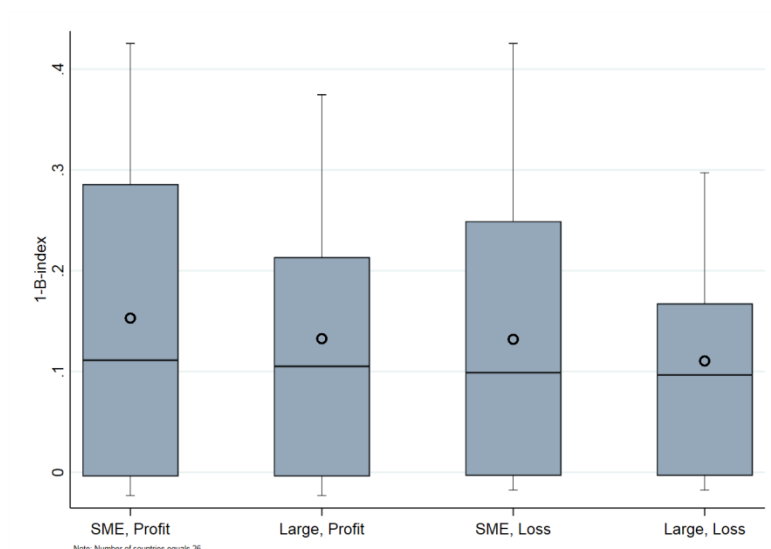
1-B-Index, by firm size and profit scenario

PANEL 4A. OECD



²² The median describes the tax subsidy rate of a country situated at the centre of the distribution. The median is unaffected by extremely high or low values and becomes important in asymmetrical distributions.

PANEL 4B. EU-28



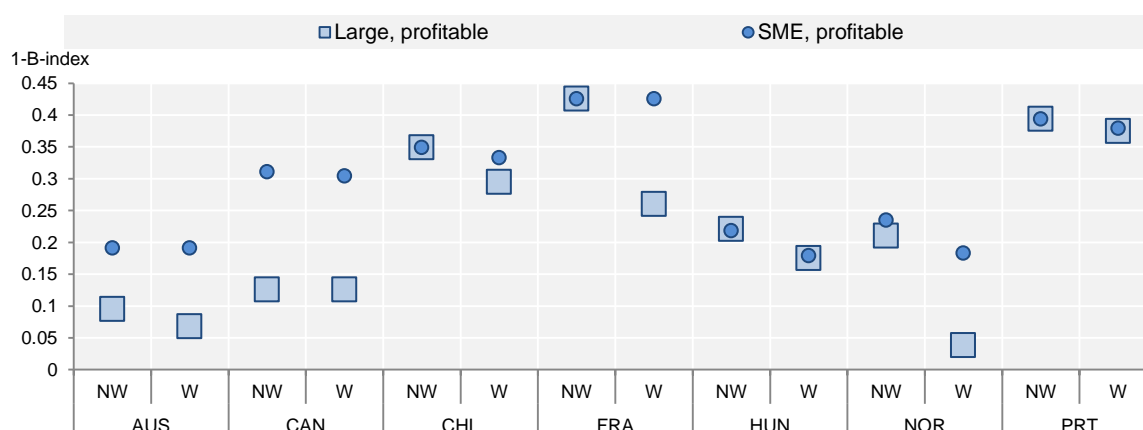
Note: This figure depicts highest and lowest values, 25th, 50th, 75th percentiles (box lines) and average (white dot). Figures reflect the tax treatment of R&D expenditure for SMEs and large enterprises in OECD, EU and other major economies, some countries of which but not all, offer tax incentive support for business R&D expenditure. No estimates are available for Estonia, Israel and Malta. Figures do not reflect preferential provisions for start-ups, young firms or a specific subset of SMEs.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, March 2018

The marginal tax subsidy rates presented for 2017 account for the effect of thresholds and ceilings whenever data or proxy measures for the distribution of eligible R&D spending are available. A comparison of implied R&D tax subsidy rates (profit-scenario) based on weighted vs. non-weighted marginal tax credit and allowance rates (**Figure 5**), produced for Australia, Canada, Chile, France, Hungary, Norway and Portugal, highlights the importance of modelling ceilings and thresholds.

Figure 5. Weighted vs. non-weighted implied tax subsidy rates on R&D expenditures, 2017

1-B-Index, by firm size (profit scenario)



*NW=non-weighted, W=weighted

Note: Figures reflect the tax treatment of R&D expenditure for SMEs and large enterprises in OECD, EU and other major economies, some countries of which but not all, offer tax incentive support for business R&D expenditure. Figures reflect the effect of applying weighted marginal tax credit (allowance) rates, where available, to account for ceilings and thresholds in the calculation of implied marginal tax subsidy rates. Figures do not reflect preferential provisions for start-ups, young firms or a specific subset of SMEs (e.g. innovative SMEs).

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, March 2018

Implied marginal tax subsidy rates based on weighted tax credit (allowance rate) often imply a lower level of subsidy compared to their unweighted counterparts, especially in the case of large enterprise where upper ceilings on qualifying R&D expenditure are more likely to be binding due to their large-scale R&D investments. This holds true for all countries considered with the exception of Canada, where the expenditure limit (threshold) is only applicable in the case of SMEs (CCPCs). For SMEs the change in non-weighted vs weighted implied marginal tax subsidy rates tends to be less pronounced, if not nil (e.g. Australia and France) when ceilings or thresholds are not binding. Future OECD work aims to apply this weighting approach more broadly in order to fully capture the effect of thresholds and ceilings across OECD and partner economies across time.

5. Conclusions and next steps

This report provides a comprehensive update on how governments across OECD, EU and other partner economies provide R&D tax incentives in 2017. The evidence presented here facilitates a number of novel and policy-relevant cross-country comparisons of R&D tax incentive schemes alongside a number of key design features. These relate to the scope and definition of R&D for tax purposes, the choice of eligible R&D expenditure and tax instrument, provisions for firms with insufficient tax liability and for a limitation of R&D tax benefits as well as targeted tax relief provisions. The R&D tax subsidy rates estimates presented in this report account for such design features and provide a synthetic representation of the generosity of a tax system from the perspective of a generic or model type of firm for the marginal unit of R&D expenditure.

These implied marginal tax subsidy rates for 2017 allow for a comparison of different business size and profitability scenarios. The broader geographical scope of these new estimates facilitates a more nuanced and comprehensive comparison of R&D tax subsidy rates of countries in the OECD and EU area. Furthermore, where data or proxy measures for the distribution of eligible R&D spending are available, these estimates account for the role of thresholds and ceilings that impact on firms differentially, through the use weighted marginal tax credit (allowance) rates. A comparison of weighted and unweighted B-index estimates, produced for selected countries, highlights the importance of modelling thresholds and ceilings.

Potential areas for future development include the refinement of tax subsidy rates based on a broader adoption of weights that reflect the distribution of eligible R&D spending relative to ceilings and thresholds that apply in countries. Such improvements would directly feed into ongoing OECD efforts to develop consistent time-series estimates of implied tax subsidies for the different scenarios considered. Another relevant dimension for improvement is to aim for a more accurate description of the actual distribution of tax support entitlement across firms, as opposed to considering set scenarios or central measures of tendency. Cross-country information on the distribution of R&D expenditure by type of firm and type of cost is crucial for developing indicators that aim to reflect the heterogeneity and distribution of “implied” tax subsidy rates across firms. At the moment, such data are not readily available. This is a key evidence gap the OECD seeks to address through the microdata related workstream of the project (“microBERD”), in collaboration with national experts with access to R&D and public support micro-data.

In addition to this, ongoing joint work with the OECD Centre for Tax Policy and Administration (CTPA) aims to incorporate evidence on tax relief for R&D into measures of effective average and marginal tax rates (EATRs and EMTRS), deriving a broader range of relevant indicators that capture not only the implied subsidy to the marginal business investment in R&D but also effective average tax rates as a measure of the average R&D tax subsidy. This will help inform R&D investment decisions at the extensive margin, such as whether to invest in a given country. It is also intended to use these estimates for analytical purposes, starting with an analysis of the extent to which changes in design features of tax subsidies for R&D translate into actual tax expenditures.

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Annex 1. Main features of R&D tax incentives in OECD and other surveyed economies, 2017

Expenditure-based R&D tax incentives			
Tax relief redeemable against CIT			Tax relief redeemable against PWHT or SSCs
R&D tax credit		R&D tax allowance	
Volume	Incremental/hybrid		
<i>Taxable:</i> Australia, Canada, Chile, United Kingdom (large firms) <i>Non-taxable:</i> Austria, Belgium (incompatible with allowance), Denmark (deficit only), France, Hungary, Iceland, Ireland, Japan (volume and special R&D), Korea (investment), New Zealand (deficit only), Norway	<i>Taxable:</i> United States (credit on fixed, indexed base and incremental for simplified credit) <i>Non-taxable:</i> Italy, Japan (high R&D intensity), Korea, Mexico, Portugal, Spain,	<i>Non-taxable:</i> Belgium, Brazil, China, Czech Republic (hybrid), Greece, Hungary, Latvia, Lithuania, Poland (R&D tax allowance, deduction for R&D Centres), Romania, Russian Federation, Slovak Republic (hybrid and volume-based), Slovenia, South Africa, Turkey (incremental), United Kingdom (SMEs)	<i>Taxable:</i> Belgium, France, Hungary, Netherlands , Russian Federation, Spain, Sweden, Turkey
Treatment of unused claims			
Refund option			
Australia (SMEs), Austria, Belgium (after five years), Canada (SMEs), Denmark, France, Iceland, Ireland, New Zealand, Norway, United Kingdom (large companies)	Italy, Spain (reduced, payable credit optional), United States (payroll tax offset for certain start-ups)	United Kingdom (SMEs)	<i>Automatic refund through wage system (limited to PWHT and SSC liability)</i>
Carry-forward option			
Australia, Belgium, Canada, Chile, France, Hungary, Ireland, United Kingdom	Korea, Portugal, Spain (unreduced, non-payable credit), United States	Belgium, China, Czech Republic, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, South Africa, Turkey, United Kingdom	<i>Not applicable</i>
Preferential tax incentive provisions or more favorable terms			
SMEs			
Australia, Canada, France, Japan (volume), Norway	Korea, Portugal (start-ups), United States (qualified small business, certain start-ups)	China, Poland (R&D tax allowance), United Kingdom (SMEs)	Belgium (young innovative firms), France (JEI/JEU), Netherlands (start-ups), Spain (innovative SMEs)
Collaboration			
France	Iceland, Japan	Hungary	Belgium
Limitation of R&D tax relief			
Threshold-dependent credit rates			
Canada (CCPCs), France			Netherlands, Russian Federation
Ceilings on amount of eligible R&D expenditure or value of R&D tax relief			
<i>R&D expenditure:</i> Australia, Austria (subcontracted R&D), Chile, Denmark, France, (subcontracted R&D), Iceland, Ireland (subcontracted R&D), Norway <i>R&D tax relief:</i> Hungary, Japan (volume and special R&D), Mexico, New Zealand (deficit only)	R&D expenditure: Portugal (incremental tax offset) R&D tax relief: Italy, Japan (incremental and high R&D intensity), Korea (large firms), Spain, United States	<i>Subcontracted R&D expenditure:</i> China, Turkey <i>R&D tax relief:</i> Hungary (R&D collaboration), United Kingdom (SMEs) <i>R&D expenditure and tax relief:</i> Slovak Republic (volume-based tax allowance)	Belgium, France, Hungary, Russian Federation, Spain, Sweden, Turkey
Accelerated depreciation provisions for R&D capital			
Belgium, Brazil, Chile, China, Denmark, France, Ireland, Israel (non R&D specific), Lithuania, Poland, Romania, Russian Federation, Spain, United Kingdom			
No expenditure-based R&D tax incentives			
Bulgaria, Croatia, Cyprus, Estonia, Finland, Germany, Luxembourg, Switzerland			

Notes: No details available for Malta.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Annex 2. Overview of eligibility of current and capital expenditure for R&D tax relief, 2017

Country	Type of tax incentive	Current R&D expenditure						Capital R&D expenditure			
		Wages and salaries of researchers and other R&D personnel	Payments for R&D services provided by consultants and other third parties	Payments for other services	Contributions to R&D carried out with 3 rd parties (e.g. collaboration agreements)	Materials and other consumables	Overheads	Acquisition of plant and machinery used for R&D	Acquisition of software, licences and IP rights used for R&D	Acquisition of land and buildings used for R&D	Depreciation /amortisation of assets used for R&D
Australia	R&D tax credit	x (a) ^R	x (a) ^R	x ^R	x ^R	x (a)	x (a)				x (a) ^R
Austria	R&D tax credit	x (3rd)	x (3rd/a) ^R		x (3rd/a) ^R	x (3rd)	x (3rd)	x (3rd)	x (3rd)	x (3rd)	
Belgium	R&D tax credit							x (3rd/a)	x (3rd/a)	x (a)	
	Payroll withholding tax credit	x (3rd) ^R									
	R&D tax allowance							x (3rd/a)	x (3rd/a)	x (3rd/a)	
Brazil	R&D tax allowance	x ^R	x ^R			x			x ^R		
Canada	R&D tax credit	x (a) ^R	x ^R		x ^R	x	x ^R				
Chile	R&D tax credit	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a)	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a)	x ^R	x ^R
China	R&D tax allowance	x	x ^R	x ^R	x ^R	x	x				x
Czech Republic	R&D tax allowance	x	x ^R			x	x ^R		x ^R		x ^R
Denmark	R&D tax credit (deficit)	x (3rd/a)	x (3rd/a)	x (3rd/a)	x (3rd/a)	x (3rd/a)	x (3rd/a)				
France	R&D tax credit	x (a) ^R	x (a) ^R		x (a)	x (a) ^R	x (a) ^R		x (a) ^R		x (a)
	SSC exemption	x (a) ^R									
Greece	R&D tax allowance	x	x ^R			x		x	x ^R		x ^R
Hungary	R&D tax allowance	x (3rd/a)	x (3rd/a) ^R	x (3rd/a)	x (3rd/a) ^R	x (3rd/a)		x (3rd/a)	x (3rd/a)	x (3rd/a)	x (3rd/a)
	SSC exemption	x ^R									
	R&D tax credit					x ^R		x ^R	x ^R	x ^R	
Iceland	R&D tax credit	x (a)	x (a)		x	x (a)	x (a)	x (a) ^R	x (a) ^R	x (a) ^R	
Ireland	R&D tax credit	x (3rd/a)	x (3rd/a) ^R		x (3rd/a) ^R	x (3rd/a)	x (3rd/a) ^R	x (3rd/a)	x (3rd/a)	x (3rd/a) ^R	
Italy	R&D tax credit (incremental)	x (a)	x (a) ^R		x (a)				x (a) ^R		x (a) ^R
Japan	R&D tax credit (volume-based)	x (a) ^R	x (a)		x (a)	x (a)	x (a)				x (a) ^R
	R&D tax credit (special R&D)	x (a) ^R	x (a)		x (a)	x (a)	x (a)		x (a) ^R		x (a) ^R
	R&D tax credit (high R&D int.)	x (a) ^R	x (a)		x (a)	x (a)	x (a)				x (a) ^R
Korea	R&D tax credit	x (a)	x (a) ^R		x (a)	x					
	R&D tax credit (investment)							x		x	
Latvia	R&D tax allowance	x ^R	x (a) ^R								
Lithuania	R&D tax allowance	x ^R	x (3rd) ^R	x (3rd) ^R		x (3rd)					
Mexico	R&D tax credit (incremental)	x	x	x ^R	x ^R	x ^R	x	x ^R		x ^R	

Country	Type of tax incentive	Current R&D expenditure						Capital R&D expenditure			
		Wages and salaries of researchers and other R&D personnel	Payments for R&D services provided by consultants and other third parties	Payments for other services	Contributions to R&D carried out with 3 rd parties (e.g. collaboration agreements)	Materials and other consumables	Overheads	Acquisition of plant and machinery used for R&D	Acquisition of software, licences and IP rights used for R&D	Acquisition of land and buildings used for R&D	Depreciation /amortisation of assets used for R&D
Netherlands	Payroll withholding tax credit	x (a) ^R				x (a)		x (a) ^R	x (a)	x (3rd) ^R	
New Zealand	R&D tax credit (deficit)	x	x		x	x				x ^R	
Norway	R&D tax credit	x (a) ^R	x (a) ^R			x (a)	x (a)	x (a) ^R			
Poland	R&D tax allowance	x	x	x ^R		x ^R			x ^R		x ^R
Portugal	R&D tax credit	x (a) ^R	x (a) ^R	x (a) ^R	x (a) ^R	x (a)	x (a) ^R	x (a) ^R	x (a) ^R		
Romania	R&D tax allowance	x (a) ^R	x (a) ^R	x (a) ^R	x (a) ^R	x (a) ^R	x (a) ^R				x (a) ^R
Russian Federation	VAT and property tax exemptions		x	x	x	x	x	x(a) ^R	x ^R	x ^R	x ^R
	R&D tax allowance	x	x ^R	x ^R	x ^R	x ^R	x				
	SSC exemption	x									
Slovak Republic	R&D tax allowance (hybrid)	x ^R	x	x	x	x	x	x	x	x	x
	R&D tax allowance (volume)	x (a)	x (a)	x (a) ^R	x (a)	x (a)	x (a)	x (a) ^R	x (a)	x (a) ^R	x (a) ^R
Slovenia	R&D tax allowance	x	x		x	x		x ^R			
South Africa	R&D tax allowance	x (3rd)	x (3rd)	x (3rd)		x (3rd)	x (3rd) ^R				
Spain	R&D&I tax credit	x (a) ^R	x (a) ^R		x (a) ^R	x (a) ^R		x (a) ^R	x (a) ^R		x (a) ^R
	SSC exemption	x (a) ^R									
Sweden	SSC exemption	x (a) ^R									
Turkey	R&D tax allowance	x(3rd)	x(3rd) ^R		x(3rd) ^R	x(3rd)	x(3rd)	x(3rd) ^R	x(3rd)		x(3rd)
	SSC exemption	x ^R									
United Kingdom	R&D tax allowance (SMEs)	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a)	x (3rd/a) ^R		x (3rd/a) ^R		
	R&D tax credit (Large firms)	x (3rd/a)	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a) ^R	x (3rd/a)	x (3rd/a) ^R		x (3rd/a) ^R		
United States	R&D tax credit	x	x ^R	x ^R	x ^R	x ^R					

(3rd): If R&D paid for by third party; (a): R&D costs incurred abroad; ^(R): See country-specific notes for information on the eligibility of expenditure items and existing restrictions.

Note: Information on eligible R&D expenditures based on 2017 OECD-NESTI data collection on tax incentive support for R&D expenditures.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

General notes:

This summary table covers national, expenditure-based R&D tax incentives and is confined to tax incentives available to the business sector, excluding tax incentive support to individuals. The table displays R&D tax incentives schemes that are available as of July 2017. This includes R&D tax credits and allowances as well as payroll withholding and social security contribution related incentives. For a summary description of R&D tax incentive schemes and the latest indicators on tax incentive support for business R&D, see <http://oe.cd/rdtax>

Country-specific notes:

Australia: Information on eligibility of expenditure refers to the R&D Tax Incentive available in Australia since 1 July 2011.

- Reductions in payroll taxes/social security contributions are not part of the tax credit formula.
- Payments to off-site consultants/ contractors qualify as eligible expenditure, but only if the eligible firms receive the benefit from R&D. Some of these costs may be incurred overseas (at least 50% of total costs of the project across all project years must be incurred in Australia).
- In most cases, firms can only claim an R&D tax offset for expenditure on R&D activities conducted on its own behalf rather than for some other entity. In some cases, partners in an R&D project may be able to claim for R&D activities the partnership has undertaken together.
- Contributions by R&D entities to publically funded Cooperative Research Centres and levy collecting Research Service Providers for the conducting of R&D activities are also eligible.
- Payments for other services qualify only if the other services fall within the definition of eligible expenditure. The R&D Tax Incentive can be claimed for the decline in value of tangible depreciating assets (except for buildings) such as plant and machinery.

Austria: Information on eligibility of expenditure refers to the research premium ("Forschungsprämie"), replacing R&D concession incentives in Austria from 2011 onwards.

- Subcontracted R&D expenditure qualifies if the subcontractor represents a qualifying EU/EEC institution which is unrelated to the principal. In case the payments fall under the definition of "extramural R&D" according to Frascati Manual, payments up to EUR 1 million per year qualify. If the fiscal year comprises less than 12 months this ceiling will be adjusted proportionally.
- Under an R&D service contract, and R&D credit may be claimed by the purchaser of the R&D service or the contracting party (principal) providing the R&D services (no double tax relief). The R&D purchasing entity has to notify the R&D service provider by the end of the fiscal year about the amount of subcontracted R&D expenditure it will claim under the research premium. These rules apply to R&D undertaken and paid for by third parties other than government. Government funds are to be deducted from the tax base.
- Payments for other services qualify for tax relief under the research premium as long as the purchases of such services are made as part of an R&D project. Payments for other services with no R&D project context do not qualify as eligible R&D expenditure.

Belgium: Information on eligibility of expenditure refers to the R&D tax credit (incompatible with allowance), R&D tax allowance and payroll withholding tax credit. Under the latter provision, only payments to wage earners with a Ph.D. or a "scientific" master degree (including engineers) are eligible for tax relief unless the company qualifies as a "young innovative company".

Brazil: Information on eligibility of expenditure refers to the R&D tax allowance available in Brazil.

- Eligible R&D expenditures include wages and salaries, other current costs, R&D contracts with selected parties.
- Taxpayer needs to adjust the employment contracts of employees that are partially dedicated to research projects and explicitly indicate that such employees work as researchers in technological innovation projects.
- The R&D tax allowance rate may increase from 60% up to 100% depending on the R&D staff growth and patent/cultivar registration: 70% for an increase of up to 5% in R&D staff; 80% for an increase of more than 5% in R&D staff; extra 20% deduction for qualifying costs incurred in developing a patent or cultivar (allowed when patent/cultivar is registered).
- Subcontracted R&D expenditure qualifies in the case of R&D subcontracted to national universities, research institutions or independent inventors or SMEs. According to article 6 of Law 11.196 (Lei do Bem), eligible expenditure further includes technical or scientific assistance and royalties for industrial patents paid to individuals or legal entities abroad, subject to compliance with the provisions of arts. 52 and 71 of Law 4.506 of November 30, 1964.

Canada: Information on eligibility of expenditure refers to the Scientific Research and Experimental Development (SR&ED) tax credit established by the federal government in Canada in 1986.

- Reductions in payroll taxes/social security contributions are not applicable. The lower of the total amount of salaries or wages for SR&ED work carried on outside Canada (subject to certain eligibility requirements) or 10% of the total of SR&ED salary or wages for SR&ED carried on in Canada can be claimed as the permissible salary or wages for SR&ED carried on outside Canada.
- The R&D tax credit base includes 80% of arm's length contract payments.

- Contract costs for non-SR&ED work (for example, work performed by electricians, welders, and mechanics) that is not one of the eight support work activities described in the definition of SR&ED in the Income Tax Act may qualify as SR&ED overhead and other expenditures under the traditional method if the directly related and incremental tests are met.
- Overhead expenses may be deducted under two methods (at the taxpayer's discretion): (i) identifying and submitting all overhead expenses; or (ii) proxy method, which calculates overhead expenses as total direct R&D labour costs multiplied by a factor of initially 65%. As of 2013, the proxy rate for the calculation of overhead expenses was reduced to 60% and to 55% in 2014.
- In determining whether the acquisition cost of software and software licences should be treated as a current expenditure or treated as a capital expenditure, the nature, purpose, and anticipated life of the computer software must be considered.
- Capital expenditures ceased to be eligible for the SR&ED tax incentive program on January 1, 2014.

Chile: Information on eligibility of expenditure refers to the R&D tax credit for intramural and extramural expenses (Law 20.570) available in Chile since September 2012.

- Wages and salaries of researchers and other R&D personnel only qualify if workers have gained experience in R&D in the previous 36 months.
- Overheads expenditure qualifies as long as it does not exceed 5% of total current expenditures of the project unless an authorisation is granted by CORFO (Corporación de Fomento de la Producción).
- The modified law considers only the acquisition of buildings in case of intramural activities for the development of the R&D project (also considers improvement and extension of existing infrastructure). The acquisition of land it is not considered.
- The new law further allows for the depreciation of assets, excluding amortisation of intangibles. Equipment must be purchased in the context of R&D activities in a certified project by CORFO.
- R&D expenditures incurred abroad are eligible if they do not exceed 50% of the total amount of R&D expenditure.

China: Information on eligibility of expenditure refers to R&D tax allowance in China.

- Cai Shui [2015] No. 119 applies from 1 January 2016. All R&D expenses shall be eligible for the R&D super deduction, unless specifically listed as ineligible. The scope of eligible R&D activities and R&D expenditures will therefore expand. Cooperative or contract R&D related costs will be eligible for the R&D Super Deduction. However, new regulation places a cap of 80% in relation to expenses incurred on a project paid to an external entrusted party.
- Depreciation expenses cover machinery and equipment as well as amortization expenditures for intangible assets. No further information on eligible R&D expenditure and existing limitations is available.

Czech Republic: Information on eligibility of expenditure refers to the hybrid R&D tax allowance.

- Effective January 2014, qualifying expenses have been expanded to include external services related to R&D provided by public R&D institutions (such as universities and research institutes).
- Likewise, expenditures on intangible results of R&D qualify as of January 2014 if acquired from a public university or a certified research organization.
- Only operating expenses directly related to R&D are eligible.
- The tax depreciation of movable fixed assets used for R&D activities qualifies.

Denmark: Information on eligibility of expenditure refers to the R&D tax credit for deficit related R&D expenses available in Denmark from income year 2012 onwards.

- Qualified R&D expenditures include salaries, cost of raw materials as well as rental costs for premises, machinery, equipment and similar equipment, in addition to payments for R&D services performed by others, and professional fees for consultants.
- Payments received by an R&D performer under an R&D service contract or cost contribution agreement do not reduce the tax credit amount available.

France: Information on eligibility of expenditure refers to the R&D tax credit (CIR) and the social security exemption for young innovative enterprises (JEI) and young university enterprises (JEU).

- Under the Crédit d'Impôt Recherche (CIR) scheme, wages of researchers with a Ph.D. or equivalent degree are considered twice for R&D credit purposes during the first 24 months following their first recruitment subject to the condition that the employment contract is unlimited and that the headcount of the research personnel is not lower than the one in the preceding year.
- Subcontracted and collaborative R&D expenses are only eligible if contracted to approved, public or private organisations up to certain limits (EUR 10 million per year and company, increased to EUR 12 million in the case R&D contracted to approved public research organisations). Expenditures for subcontracted R&D are doubled if the R&D is outsourced to selected, approved research institutions.
- Only purchases of immobile material qualify as eligible expenditure.

- Operating expenses related to R&D activities are estimated on a flat-rate basis (for fixed assets: 75% of depreciation expenses and 50% of labour costs for researchers and research technicians; in the case of young Ph.D.'s 200% of their actual non-doubled wage during first 24 months). Operating expenses cover in particular the expenditure for support staff, administrative expenses, raw materials, etc.
- Expenses related to the granting, maintenance, depreciation and defence of patents further qualify under the CIR.
- Under the JEI and JEU provision, wages and salaries paid to researchers, technicians, R&D project managers, lawyers involved in the protection of industrial and technology agreements related to the project and personnel responsible for pre-competitive testing qualify.

Greece: Information on eligibility of expenditure refers to the R&D tax allowance in Greece.

- Expenditures for subcontracted R&D are eligible only if the R&D is contracted out to research laboratories of the public sector.
- Cost incurred for the licensing of patents, know-how, etc., related to the execution of the project qualify for the tax incentive.
- Eligible depreciation expenditure only covers machinery and equipment. R&D capital spending is considered as investment under tax legislation so that it may be written off over three years.

Hungary: Information on eligibility of expenditure refers to the R&D tax allowance, development tax incentive (R&D tax credit) and exemption of social security contributions.

- Under the R&D tax allowances, payroll taxes and social security contributions are part of the direct costs of R&D activities, and are thus deductible in proportion to the other activities carried out by the researchers.
- On the basis of the Act C of 2000 on Accounting, direct costs of R&D include classified costs incurred in connection with an R&D activity if it is clearly stated and proved that these costs are directly related to the R&D activity and incurred in connection with the R&D activity. Payments to on site consultants and contractors might be regarded as direct costs of the R&D activity if consultants and contractors are experts of the special field of the specified R&D.
- Costs of research and experimental development services might be deducted by the person to whom they were provided if the service provider declares of having provided the service without the involvement of research and experimental development services provided by a resident taxpayer or by the Hungarian branch of a non-resident entrepreneur, or by a private entrepreneur governed under the Act on Personal Income Tax.
- Subcontracted R&D activities and R&D activities performed based on a collaboration agreement may also be performed abroad.
- Under the most recent regulation, the rate of social contribution tax and the vocational training contribution will be 0 percent (instead of 23.5 percent) for gross wages of researchers up to 500 000 HUF per month. In 2017 PhD student or doctoral candidates social contribution tax rate was 12.5% (instead of 23.5 percent) for gross wages of researchers up to 200 000 HUF per month.
- Under the development tax incentive, firms receive tax support for investment projects with a value of at least HUF 100 million. The amount of tax relief is calculated as a certain percentage ("intensity ratio") of the eligible cost based on the Regional Aid Map defined by the EU Commission. Once the investment project is completed, the taxpayer can utilise the credit within 12 years. The utilisation of the credit is at the discretion of the enterprise but cannot surpass 80% of the annual tax liability in a given year. Qualifying costs include capital expenditure. The value of intangible assets which may include inventions, patents, licenses and know-how must not exceed 50 % of total eligible costs.

Iceland: Information on eligibility of expenditure refers to the tax credit in Iceland. The cost of tools and equipment, buildings and land is eligible for the tax credit to the extent and only for the time period during which such equipment or property is used for research purposes. Costs incurred for contractual research, technical knowledge and patents bought or licensed obtained from outside sources at market in arm's length transactions and costs for consultants and similar services exclusively used in connection with research activities, further qualify for the tax incentive.

Ireland: Information on eligibility of expenditure refers to the R&D tax credit in Ireland.

- Contracted research costs are subject to a limit of 15% of total qualifying expenditures on R&D activities in any one year. This applies where the subcontractor carrying out the research and development activities is unrelated to the company which paid for the research. Where the R&D activities are contracted to a university or institute, the limit is 5% of the company's R&D expenditures in the period. For accounting periods ending after 1 January 2012, the subcontracting limit is the greater of EUR 100 000, or the 15% and 5% limits described above. Overheads are eligible only if wholly and exclusively incurred directly in the carrying on of the qualifying R&D activity.
- Qualifying capital expenditure only includes machinery, equipment and buildings (at least 35% of their use shall be for R&D). Land is excluded.

Italy: Information on eligibility of expenditure refers to the R&D tax credit (Legge di Stabilità 2015, 2017).

- Under the R&D tax credit qualifying expenditures include the cost of research contracts with universities, research institutions and establishments, and other entities, including innovative start-ups.
- Eligible expenditures further include the acquisition cost incurred for technical and industrial property related to an invention industrial biotechnology, a topography of semiconductor product or a new plant variety acquired from external sources, as well as the amortization of acquisition costs or utilization of instruments and laboratory equipment and total labour cost incurred by companies for personnel employed in R&D activity (as from 2017 the distinction between highly and non-highly qualified personnel has been removed).
- Eligible payments for other services include audit and certification expenditure up to a limit of EUR 30,000.
- Eligible expenditures also include R&D contracted by resident firms or permanent establishments of non-residents to firms from other EU member states or from the European Economic Area.

Japan: Information on eligibility of expenditure refers to the volume-based R&D tax credits for large companies and SMEs, the R&D tax credit for special (collaborative) R&D, and the high R&D intensity tax credits.

- Labour expenditure generally includes wages and salaries paid to employees who devote almost 100% of their time to R&D.
- Depreciation of acquired plant and machinery as well as buildings is eligible. Depreciation of a part of acquired software is eligible.
- Under the application of the R&D tax credit for special R&D, expenses related to licences and IP rights are eligible when the licensors or the initial IP owners are "SMEs" as defined in the Japanese taxation system.
- The R&D tax credits apply to R&D deductible expenses rather than depreciation of R&D assets.

Korea: Information on eligibility of expenditure refers to the hybrid R&D tax credit and R&D investment tax credit available in Korea. The R&D investment credit applies to facility investments (machinery and buildings) made for the purpose of R&D and job training.

Latvia: Information on eligibility of expenditure refers to the volume-based R&D tax allowance introduced in Latvia with effect from July 2014 onwards.

- Payroll taxes and social security contributions are included in labour costs when CIT tax allowance is calculated.
- Eligible R&D expenses include research services acquired from scientific institutions, registered by the Ministry of education and science, or equivalent scientific institutions, as well as expenses in testing, certification and calibration services that are required for a new product or technology development and provided by an accredited certification, testing and calibration institution nationally or in a Member State of the EU or the European Economic Area country with which Latvia has signed treaty on avoiding double taxation.
- The tax incentive can be applied for by companies incorporated in Latvia and by registered branches of foreign companies.

Lithuania: Information on eligibility of expenditure refers to the R&D tax allowance.

- Eligible expenditures include: 1. wage costs and costs of compulsory health insurance contributions and state social insurance contributions deducted from wages of the employees directly involved in R&D works; 2. costs of secondments directly related to R&D works and necessary for performance of R&D works; 3. costs of raw materials and/or materials, other current assets used in performing R&D works; 4. costs incurred in purchase of services (scientific consultancy services, lease of premises and/or equipment, public utilities, maintenance, storage, telecommunication and other services) directly related to R&D works and necessary for performance of R&D works; 5. costs incurred in purchase of constituent works of R&D works from other taxable entity or natural person, if such purchased works are performed in the country of the European Economic Area or in the country which is outside the European Economic Area, but with which the Republic of Lithuania has concluded the double taxation convention and applies its provisions; 6. amounts of the value added tax on purchase and import duties deducted from the costs specified in this section which are not deductible according to the provisions of the Republic of Lithuania Law on Value Added Tax."
- Eligible labour costs include wages of employees who are directly involved in scientific research and experimental development works.
- Payment to off-site consultants are eligible only if the outsourced R&D work was carried out in the European Economic Area or in a non-EEA State with which Lithuania has concluded and applies a double taxation agreement.
- Eligible services include costs for acquisition of services directly related to scientific research and experimental development works (consulting, leasing, repair, warehousing, telecommunication, etc.).

Mexico: Information on eligibility of expenditure refers to the incremental R&D tax credit introduced in Mexico with effect of January 2017.

- Eligible expenses include payments related to costs of external services provided by specialized natural or legal persons of domestic origin, whose services cannot be performed by the contractor and which have to be performed in order to fulfil the objectives of the R&D project and which have been previously accounted for in the project proposal (up to 15% of the total costs of the R&D project). External services refer to a specific and well defined activity which is directly related to the procedures or methodology of the R&D project proposal, whose supporting documentation complies with the corresponding fiscal and legal rules (agreement or contract with specific objectives; on-line digital tax documentation; fees payments).

- Eligible expenses include payments to public or private Higher Education Institutions or Public Research Organizations, registered or pre-registered in the National Registry of Scientific and Technological Institutions and Companies (RENIECyT), for their collaboration in the project, provided that their collaboration has previously been registered in the Electronic Platform and is in compliance with the amounts and conditions thereby specified, as well as with those provisions specified in the collaboration agreement regarding the calendar of payments, which shall be supported by the corresponding official bills of the HEI or PRO, accordingly.
- Eligible expenses include reagents, solutions, and any other inputs required to perform experimental designs which are needed for the completion of the investment project.
- Specialized machinery needed for the completion of the investment project. This includes the costs of renting specialized equipment which, due to its costs, is not profitable to be bought, but is required in order to perform tests, experiments or other activities relevant for the completion of the investment project and which is not rented to related parties.
- Eligible expenses include the acquisition or leasing of properties and buildings. It is considered that the firm must have the necessary buildings to perform the investment project.

Netherlands: Information on eligibility of expenditure refers to the WBSO ("Wet bevordering speur- en ontwikkelingswerk") tax credit for R&D.

- Starting in 2016, the previous WBSO and RDA are merged into a single scheme called the WBSO. This means that from 2016 onwards the WBSO tax credit includes both the wage costs of an R&D-project (previously handled by the WBSO) and its other costs and expenses (previously handled by the RDA). The tax benefits are administered entirely through payroll taxes (and no longer in part through taxation on profits).
- Under the WBSO, R&D activities must occur within the EU and must be performed by employees on the Dutch payroll.
- Spending on plant and machinery and building qualifies for the WBSO; excluded are investments in land and business assets which qualify for the energy or environmental investment allowance.

New Zealand: Information on eligibility of expenditure refers to the R&D tax credit for deficit related R&D expenses. Spending on buildings and land, only if exclusively used for housing R&D facilities, qualifies.

Norway: Information on eligibility of expenditure refers to the SkatteFUNN R&D tax credit.

- Labour costs are calculated as numbers of hours worked multiplied by an estimated wage rate including overhead cost (NOK 600 per hour and max 1850 hours per year). The tax base does not include unpaid hours worked (mainly by the owners).
- R&D expenditures must be related to taxable income in Norway. There are no territorial restrictions related to SkatteFUNN, i.e. own and subcontracted R&D may take place in any part of the world. A company may subcontract R&D to any other entity in any other country. A general condition for eligibility is that the R&D cost in question is incurred with the aim of obtaining an income for the applicant. A company would not be entitled to a tax credit for R&D undertaken for another company, for example a foreign parent company. R&D for other entities does not qualify for SkatteFUNN.
- There are no specific rules regarding cost contribution agreements; instead, payments under such agreements are deductible according to the general deduction rules. In the case of collaboration, every business needs to send its own SkatteFUNN application and describe its project activities in order to get tax deductions for project costs.
- The cost of R&D equipment qualifies. Patent and licensing costs are not included, except for the costs of patenting incurred in the context of a company's own R&D activity.

Poland: Information on eligibility of expenditure refers to the R&D tax allowance in effect from 1 January 2016 onwards.

- Eligible payments for services include expenses incurred for the payment for expert's opinions, opinions, consultancy services and similar services.
- Expenses related to the cost of materials refer to purchases of materials and raw materials directly related to the undertaken R&D activity and costs related to the use of research instruments. The application of the tax credit is dependent on the use of the instruments not based on any contract concluded with an entity related to the taxpayer.
- Eligible intangibles include expenses incurred for the purchase of results of scientific research, rendered or performed on a contractual basis by the scientific unit.
- Depreciation and amortisation refers to write-offs applied for the undertaken research and development activity, except for passenger cars and facilities, buildings and premises being separate ownership. This, for instance concerns: machinery, new invention patents, software licences, know-how.
- The tax credit may be applied irrespectively of the fact whether the costs incurred were paid to the supplier or not.

Portugal: Information on eligibility of expenditure refers to the SIFIDE-II R&D tax credit.

- Eligible expenditure includes wages for personnel directly involved in R&D, with minimum qualifications level 4 of the National Qualifications Framework. In the case of personnel with a qualification level of 8 according to the National Framework of Qualifications (PhD holders), the amount of the wage is multiplied by a factor of 1.2.
- The cost of R&D contracts with external S&T organisations (public entities and/or from entities recognized as possessing R&D capabilities) qualify as well as the cost of R&D audits.
- Payments under a cost contribution agreement that fall within the definition of R&D expenditure also qualify.
- Operating expenses, such as overhead, are eligible up to 55% of wages of personnel directly involved in R&D activities.
- Spending on machinery and equipment, if machinery and equipment are created or acquired in new condition, further qualifies. Patent acquisition costs related to R&D activities are only

eligible in the case of SMEs.

Romania: Information on eligibility of expenditure refers to the R&D tax allowance.

- Eligible expenditure comprises costs of personnel involved in the R&D activities, including activities related to their needs (documentation, conducting studies, experiments, measurements, testing and exchange of experience) and the salaries of staff participating indirectly in the R&D activity.
- Regarding sub-contracted costs, they include operating costs, third-party services expenses, expenses on consumables, expenditure on materials inventory objects, expenses for raw materials, parts, modules, components, expenditure on experimental animals and other/similar goods used in research and development.
- Overheads that can be allocated directly or proportionately research results by using an allocation key; the key shall be the one used by taxpayers to allocate common expenses.
- Depreciation costs or rental of tangible and intangible assets or part of these costs for the period of use of tangible and intangible assets in research and development (accelerated depreciation also may be applied for the equipment used for R&D activities).

Russian Federation: Information on eligibility of expenditure refers to the R&D tax allowance, VAT and property tax exemptions and reduction of social security contributions available to R&D performing organisations (by main type of their economic activity according to the National Classification of Economic Activities) as well as some other S&T institutions.

- Tax exemptions include VAT exemptions (for R&D and wider S&T activities as well as operations on protection and commercialisation of IPRs), property tax exemptions for state scientific centres (list-based) and income tax exemptions applicable for educational organisations (incl. HEIs) under certain conditions (art. 284.1 of the Tax Code).
- Organisations taking part in Skolkovo projects are eligible for all above mentioned tax exemptions. Skolkovo management companies are further exempt from the land tax.
- Intangibles eligible include transfer of exclusive rights on IP and rights on using these items within license contracts.
- Depreciation expenditure qualifies if related to buildings. Accelerated depreciation can be applied to fixed assets used in S&T activities and also eligible for high energy efficient M&E in accordance with the list approved by the Government of the Russian Federation.
- Under the tax allowance scheme other current costs within eligible R&D expenditures may not exceed 75% of total R&D labour costs, and all eligible R&D expenditures may include deductions to STI foundations, but not exceeding 1.5% of revenue.
- According to the tax allowance scheme eligible R&D expenditure can be increased by a multiplying factor of 1.5 for R&D included in the priority-list (except SSH) approved by the Government of the Russian Federation.
- Reduction of social security contributions is applicable for educational and R&D performing organisations, SMEs founded by universities or research institutes (e.g. start-ups) and IT companies (meeting certain operational requirements).

Slovak Republic: Information on eligibility of expenditure refers to the hybrid R&D tax allowance scheme and the volume-based R&D tax allowance for grant subsidy recipients.

- Under the R&D tax allowance (hybrid) scheme, labour cost qualifies only if the employee is an EU citizen younger than 26 years and has completed a secondary or university education in the previous two years.
- Under the R&D tax allowance scheme for grant subsidy recipients, costs of consultancy and equivalent services used exclusively for the project qualify.
- Costs of instruments and equipment to the extent and for the period used in the project. If such instruments and equipment are not used in the project throughout its useful life, eligible costs are considered only the depreciation corresponding to the duration of the project, calculated on the basis of generally accepted accounting principles.
- The deduction includes the depreciation of buildings and the commercial transfer or capital costs of land.

Slovenia: Information on eligibility of expenditure refers to the R&D tax allowance. Eligible expenditure includes purchases of R&D equipment only if such equipment is used exclusively and permanently for the purposes of the taxpayer's R&D activity.

South Africa: Information on eligibility of expenditure refers to the R&D tax allowance. Eligible expenditure includes overhead expenses only if directly related to R&D. Depreciation expenditures related to M&E further qualify subject to standard depreciation rules as accelerated depreciation for R&D capital was repealed in October 2012. Depreciation of R&D assets do not qualify for enhanced rate, but do receive accelerated depreciation allowances (improvement at a rate of 40:20:20:20 and new unused machinery or plant at 50:30:20).

Spain: Information on eligibility of expenditure refers to R&D&I tax credit and partial exemption of social security contributions.

- Qualifying R&D expenses for the credit may correspond to activities carried out in Spain or in any Member State of the European Union or the European Economic Area. In turn, shall be considered as research and development expenses amounts paid for carrying out such activities in Spain or in any Member State of the European Union or the European Economic Area, on behalf of the taxpayer, whether alone or together with others.
- For tax years beginning after 2015, the regulatory framework is the Law 27/2014, of November 27. The income tax Chapter IV, Article 35 sets out the measures regulating tax deductions for R + D + i, as well as rules on the application of Article 39. Deductible expenses and investments: project expenditures (personnel, depreciation, consumables, external

collaborations, etc.), provided they meet: a. Direct costs, b. Individual projects and c. Effectively applied to the project form.

- Companies that do not make use of the tax deduction for R&D (R&D tax credit) may deduct 40% of employers' social security contributions for research staff. Registered "Innovative SMEs" (innovation intensive SMEs) can benefit from both schemes at the same time. Companies benefiting from the bonus should be devoted to R + D + i and hire workers: (i) With a permanent or temporary contract internship or work or service 3 months minimum. (ii) Exclusively dedicated, full-time, to the realization of R + D + i as defined in Article 35 of the Corporation Tax Act. For these purposes, it is admitted that up to 15% of the time spent on tasks of training, dissemination or the like, to compute the exclusive R & D commitment. (iii) Included in contribution groups in the General Scheme of the Social Security Numbers 1 (engineers and graduates, and senior management personnel not included in article 1.3.c) ET); 2 (Technical Engineers, experts and qualified assistants); 3 (Chief Administrative and Workshop) and 4 (helpers graduates).

Sweden: Information on eligibility of expenditure refers to the reduction in contribution amounts for social security charges for R&D employees.

- Employees must work at least 75% of their working hours on R&D and at least 15 hours per month, and be aged between 18 and 64 at the beginning of the year when the reduction is claimed. Until 31 May 2016, the lower age limit was 26 years old.
- Reduced social security contributions apply only for tasks concerning commercially performed R&D (business-oriented systematic and qualified research or development).
- The salary must be paid from an employer which is tax resident in Sweden, the form of employment does not matter, nor if they have worked in Sweden or any other country.
- All enterprises can get the reduction, except self-employed and partners in a trading partnership. The deduction cannot be made by public employers (state, county, municipality or university) that are themselves engaged in research. Private companies engaged in the framework of a public sector R&D project cannot deduct the net R&D salary costs either.
- However, deduction can be made if the employer receives public funding for their own research activities. Deduction can also be made if the employer receives government grants to certain employees engaged in R&D, for example, in the form of subsidies.

Turkey: Information on eligibility of expenditure refers to the R&D tax allowance and exemption of social security contributions for R&D and support personnel who work in R&D centres on R&D and innovation projects.

- Under the tax allowance, companies ordering contracted R&D and innovation/design activities will benefit from R&D deduction, as well as the parties carrying out contracted R&D activities, sharing the total incentive amount by 50% - 50%. Benefits and services received from third parties may not exceed 50% of total R&D and innovation expenses.
- Only capital spending on machinery qualifies for tax relief.
- The full-time-equivalent support personnel who benefit from the employer share insurance premium cannot exceed 10% of the number of total full-time R&D personnel.

United Kingdom: Information on eligibility of expenditure refers to the R&D tax allowance (Corporate Tax Credit for Research & Development) and Research and Development Expenditure Credit (RDEC) for large companies, introduced for expenditure incurred on or after 1 April 2013. The RDEC was initially optional and ran alongside the Large Company enhanced-deduction scheme (Corporate Tax Credit for R&D), which it replaced in April 2016.

- The qualifying expenditures are the same for the Corporate Tax Credit for Research & Development and the RDEC.
- The staff must be employed under a contract of employment directly with the company or organisation - not consultants, agency workers, or staff/directors whose contracts of employment are with other companies. However, these others may qualify under either the rules for staff providers or subcontractors.
- Large companies can only claim subcontract costs if they are paid to a university, health authority, charity, scientific research organization, individual, or a partnership of individuals.
- SMEs can claim R&D related subcontract costs in the following situations:
 - Payments to unconnected subcontractor: If the company and the subcontractor are not "connected" (CIRD82150) the company can claim R&D tax relief on 65% of the payment it makes to the sub-contractor. The subcontractor does not have to do the work itself but can subcontract the work to a third party.
 - Payments to connected subcontractor: If the company and the subcontractor are "connected", the company can claim R&D tax relief on the lower of:
 - the payment that it makes to the subcontractor, and
 - the relevant expenditure of the subcontractor, so long as the whole amount of the subcontract payment is brought into account in determining the subcontractor's profit in accounts drawn up under GAAP ending within 12 months of the end of the claimant company's accounting period for which the relief is claimed. The company and the subcontractor may jointly elect to be treated as if they are connected even though they are not connected. The election applies to all payments under the same contract arrangement and must be made by notice in writing gives to HMRC officer with responsibility for the principal's affairs within 2 years of the end of the principal's accounting period in which the contract is made. The subcontractor does not need to be UK resident and there is no requirement for the subcontracted R&D to be performed in the UK. The actual work carried out by the subcontractor need not be R&D when looked at in isolation. For example a company might as part of its R&D activities need to subcontract analytical testing of a material to another person who has the specialised machinery needed for the test. The testing may be well established and routine, and on its own it would not be R&D. But the subcontracted work will count as R&D from the perspective of the company, because it is one component of a larger project that is R&D. One of the conditions for a company to make a claim under the SME scheme is that the expenditure is not incurred in carrying on R&D activities as a subcontractor. In some cases, the SME company may still be able to make a claim under the Large Company scheme CIRD89500. This will entitle the company to a 30% deduction for qualifying expenditure.

However, losses arising from that expenditure cannot be surrendered for a payable tax credit.

- Regarding payments received by third party for subcontracted R&D, SMEs cannot claim the more advantageous small company relief on costs that are subsidized or related to activities that were contracted to them, although they may be able to make a claim under the less generous Large Company relief (which means the SME would be unable to monetize losses into cash refunds). Large companies can claim the relief on costs associated with work that is contracted for them as long as it was contracted by another large company or any person not subject to UK tax.
- SMEs cannot claim for contributions made to independent research, while large companies can do so.
- Overhead expenditure qualifies as long as it falls within specific categories of expenditure.
- Eligibility of intangibles includes software used directly in carrying out R&D and no deduction for licenses and IP rights

United States: Information on eligibility of expenditure refers to the Federal research and experimentation tax credit.

- Eligible expenditure includes 65 percent of any amount paid or incurred by the taxpayer to any person (other than an employee of the taxpayer) for qualified research (75 percent for amounts paid to certain research consortia and 100 percent for amounts paid to certain small businesses, institutions of higher education and Federal laboratories).
- Supplies qualify for the credit if they are used in the conduct of qualified research. Title 26 U.S. Code Section 41(b)(2)(C) defines a supply as any tangible property other than land or improvements to it and depreciable assets like buildings and equipment. Since overhead costs, leasing expenses, and licensing fees are not tangible property, they cannot be regarded as supplies for the purpose of claiming the credit. Supplies are used in the conduct of qualified research if an employee of the taxpayer uses them to provide qualified services. So, a supply qualifies for the credit if it can be regarded as non-depreciable tangible property acquired by a company that is used in the performance of qualified services.

Annex 3. Subcontracting rules – terms and conditions governing R&D tax relief eligibility

Country	Tax relief claimant*	Terms and conditions, including ceiling (if applicable)
Australia	F	Refundable R&D tax offset: Expenditure in R&D activities performed by you or for you. Contributions by R&D entities to publically funded Cooperative Research Centres and levy collecting Research Service Providers for the conducting of R&D activities are also eligible.
Austria	F or P	R&D TC - Research premium: The purchaser or contracting party providing the R&D service can claim tax benefits (no double tax relief). Qualifying EU/EEC institution must be unrelated to the principal. Research conducted by a member of the same group of company is not eligible. The R&D purchasing entity notifies by the end of the fiscal year about the amount of subcontracted R&D to be claimed under the research premium. The qualifying expenditures of the R&D provider are relieved by that amount. <u>Ceiling:</u> subcontracted R&D expenditure capped at EUR 1 million.
Belgium	P	R&D TC: Expenditures of an R&D centre acting on behalf of another party are eligible for the R&D tax credit. R&D TA: R&D centre acting on behalf of another party is eligible for R&D investment deduction.
Canada	F	Scientific Research and Experimental Development (SR&ED) investment tax credit: i. Arm's length SR&ED Contracts – The party that contracts a third to perform R&D, can claim the qualified SR&ED expenditure for investment tax credit (ITC) purposes. The party performing the work can claim the SR&ED expenditures for the contract but needs to reduce by that amount their qualifying SR&ED expenditures for ITC purposes. No duplication of ITC entitlement. ii. Non-arm's length SR&ED contracts – Performer and claimant are related parties (one exerts control over the other). Claimant's expenditures with respect to the SR&ED contract are allowable SR&ED expenditures but do not qualify for ITC purposes. The performer can claim the SR&ED expenditures and qualified expenditures related to SR&ED work and since the amount received is not considered a contract payment, it does not reduce the performer's qualified expenditure for ITC purposes. iii. Third-party payments: A claimant can make payments to other entities to be used for SR&ED. This situation gives the payer entitlement only to the results of the SR&ED and not to the SR&ED (as opposed to contract situations). With some exceptions, third-party payments become eligible for SR&ED tax incentives at the time of the payment (cash basis).
Czech Republic	F	R&D TA: Expenditure on external services for R&D provided by public R&D institutions (e.g. universities and research institutes) qualifies for relief.
Denmark	F and P	R&D TC for deficit related R&D expenditure: Qualified R&D expenditures include payments for R&D performed by others. Payments received by the performer under an R&D service contract or cost contribution agreement do not reduce the tax credit available. No additional details available.
France	F	R&D TC - Crédit d'Impôt Recherche (CIR): The sums received by the subcontractors (in the context of public or private subcontracting) from which or from whom the R&D operations have been commissioned are deducted from the base for calculating their own tax credit. <u>Ceiling:</u> EUR 10 million cap per year and per company applied for R&D subcontracted to approved public or private organisations; EUR 12 million cap for R&D subcontracted to approved public research organisations and EUR 2 million if taxpayer and the subcontractor are related. Private subcontracted R&D expenses are capped at an amount equal to three times all other qualifying expenses, but it cannot exceed EUR 10 million. For Innovation expenditure, the ceiling is EUR 400,000. Expenditures on subcontracted R&D are taken into account twice (doubled) if the R&D is outsourced to certain approved research institutions.
Greece	F	R&D TA: Firms that subcontract R&D to research laboratories of the public sector qualify for the R&D tax allowance. The public research laboratories as subcontractors are not entitled to R&D tax relief for the R&D they have been commissioned by companies.
Hungary	P	R&D TA: The tax relief may be claimed by the firm carrying out R&D activities using the taxpayer's own assets and workers at the taxpayer's risk and benefit. This includes R&D activities carried out by the taxpayer's workers using the taxpayer's own assets on behalf of others, as well as (joint) research and development activities carried out under research and development agreements. <u>Ceiling:</u> maximum of HUF 50 million per year and organization for R&D expenditure related to R&D collaboration.
Iceland	F	R&D TC: Company who owns the R&D projects will be eligible to claim the tax credit. In collaboration between two or more parties, the tax deduction is prorated between the participating companies. <u>Ceiling:</u> ISK 450 million in the case of purchased R&D or collaboration agreement.
Ireland	F or P	R&D TC: If an Irish company performs research for other unrelated companies for a fee, the company performing the research is permitted to claim the credit, as long as the company providing the

		<p>funding is not claiming the credit. Two situations are contemplated: 1) The subcontractor is unrelated to the company who paid for the research.</p> <p>2) A university of institute of higher education carries out the qualifying R&D.</p> <p><u>Ceiling:</u> Contracted research costs up to a limit of 15% (5%) of total qualifying expenditures on R&D activities (if R&D activities are contracted to a university or institute). For accounting period ending after 1 January 2012, the subcontracting limit is the greater of EUR 100,000 or the 15% and 5% limits described above (10% before January 2014)</p>
Italy	F	<p>R&D TC:</p> <p>Costs of research contracts with universities, research institutions and establishments, and other entities, including innovative start-ups. Eligible expenditures also include R&D contracted to firms from other EU member states or from the European Economic Area.</p>
Japan	F	<p>R&D TC (volume-based and high R&D intensity):</p> <p>Payments received by an R&D performer under an R&D service contract, or cost contribution agreement, reduce the base of the R&D tax credit – in particular, if the funding is from another party then the R&D tax benefit is not available for those funded expenses. In general, research expenses that are funded by unrelated entities (government agencies, customers, suppliers, etc.) are not eligible for research credit.</p>
Korea	F	<p>R&D TC:</p> <p>Tax Credit not available for performers.</p>
Latvia	F	<p>R&D TA:</p> <p>The paying company will be able to claim the tax benefit for payments made to registered Scientific Institutions for qualifying R&D activities and the payments made to accredited institutions for performing certification, calibration and testing services are qualified research expenses. The R&D performer cannot claim the tax allowance.</p>
Lithuania	F	<p>R&D TA:</p> <p>Only if the outsourced R&D work was carried out in the European Economic Area or in a State which is outside the European Economic Area, but with which the Republic of Lithuania has concluded and applies a double taxation agreement.</p>
Netherlands	P	<p>WBSO: The costs of outsourced R&D do not qualify for the WBSO scheme. WBSO support is provided only for R&D that is carried out in the firm that claims WBSO support. If R&D is contracted out by a firm, the contractor may be able to apply for WBSO support for this R&D.</p>
New Zealand	F	<p>R&D loss TC:</p> <p>If a business pays another business to provide R&D services, the business that pays for the R&D (owns any resulting IP) can claim the tax credit, but the business that provides the services cannot.</p>
Norway	F	<p>R&D TC - SKATTEFUNN: A company can claim tax relief for R&D subcontracted to approved R&D institutions or other entities.</p> <p><u>Ceiling:</u> The credit is subject to an annual limitation per project, company and fiscal year: Own R&D (inclusive of R&D procured from entities other than approved R&D institutions, including units in the same enterprise group if the transaction is based on market prices): NOK 25 million; Subcontracted R&D to approved R&D institutions: NOK 50 million. The sum of in-house and contracted R&D services may not exceed NOK 50 million.</p>
Portugal	F	<p>R&D TC – SIFIDE II:</p> <p>R&D contracts with external S&T entities (public entities and/or entities recognized as possessing R&D capabilities). Excludes the deductibility of all expenses incurred by taxable persons carrying out R&D projects or providing services of R&D by a fee, not acquiring any rights to the results of this R&D activity.</p>
Romania	P	<p>R&D TA:</p> <p>Tax incentives are granted to the part taking the risk irrespective of the costs incurred. This is typically the performer of the R&D activity (assuming all other conditions are fulfilled). The contracting party should not deduct the contractual expenses with the third-party as expenses and therefore should not benefit on the incentive. R&D tax incentives are also granted to taxpayers, who perform R&D activities for the benefit of group companies, provided they also receive the full right to use the results of those R&D activities.</p>
Russian Federation	F	<p>R&D TA:</p> <p>A contractor performing R&D cannot claim the incentive. The third-party can make the claim if it complies with the criteria.</p>
Slovak Republic	F (P: public); P (F) (P: private)	<p>R&D TA (Super Deduction):</p> <p>Fees paid for subcontracting R&D are qualifying expenses if work is subcontracted to public universities or public research institutes. Fees paid to certified private R&D organisations are also eligible as long as the organisation does not claim the super deduction for the costs it incurred in providing the qualified services.</p>
Slovenia	F	<p>R&D TA:</p> <p>The contracting company (principal company) can claim the costs of contracts with external experts and researchers performing the R&D work and the costs of contracts with R&D organisations and other parties that are registered for performing R&D activities.</p>
Spain	F	<p>R&D&I TC:</p> <p>R&D expenditure if paid for by a third-party does not qualify for the R&I tax credit, i.e. the sums paid to companies from whom R&D operations have been commissioned (R&D subcontractors) are deducted from the base for calculating their own tax credits [Article 35.1.b) TRLIS].</p>
Turkey	F and P	<p>R&D TA:</p> <p>Companies can deduct up to 20% of total R&D and innovation expenses for services received from a third-party. Companies ordering contracted R&D and innovation/design activities will</p>

		benefit from R&D deduction, as well as the parties carrying out contracted R&D activities, sharing the total R&D incentive amount by 50 – 50%.
United Kingdom	F	<p>R&D TA (SMEs):</p> <p>A. <i>Payments made by SME for subcontracted R&D:</i></p> <p>i. <i>Unconnected subcontractor:</i> The company can claim R&D tax relief on 65% of the payment it makes to the subcontractor.</p> <p>ii. <i>Connected subcontractor:</i> The company subcontracting can claim R&D tax relief on the lower of (a) the payment to the subcontractor, (b) the relevant expenditure of the subcontractor, so long as the whole amount of the subcontract payment is brought into account in determining the subcontractor's profit in accounts drawn up under GAAP ending within 12 months of the end of the claimant company's accounting period for which the relief is claimed.</p> <p>The company and the subcontractor may jointly elect to be treated as if they are connected even though they are not connected. The subcontractor does not need to be UK resident and there is no requirement for the subcontracted R&D to be performed in the UK. To make a claim under the SME scheme, one of the binding rules is that work is not conducted as a subcontractor. These claims can however be made using the Large Company scheme (CIRD89500) which entitles a deduction of 30%.</p> <p>B. <i>Payments received by third-party for subcontracted R&D:</i> SMEs cannot claim the more advantageous small company relief on costs that are subsidized or related to activities that were contracted to them, although they may be able to make a claim under the less generous Large Company relief (which means the SME would be unable to monetize losses into cash refunds). Large Companies can claim the relief on costs associated with work that is contracted for them as long as it was contracted by another Large Company or any person not subject to UK tax, e.g., UK Large Company performs research for a U.S. company that is not subject to UK tax. <i>Contributions to R&D carried out by third party:</i> SMEs cannot claim for contributions to independent research, while large companies can do so.</p>
	P	<p>Research and Development Expenditure Credit (RDEC) Scheme (large companies):</p> <p>A. <i>Payments made by Large Company for subcontracted R&D:</i> Not allowable. Large companies can only claim subcontracting costs if they are paid to a university, health authority, charity, scientific research organisation, individual, or a partnership of individuals.</p> <p>B. <i>Payments received by third party for subcontracted R&D:</i> Large companies can claim the relief on costs associated with work that is contracted for them as long as it was contracted by another Large Company or any person not subject to UK tax, e.g., UK Large Company performs research for a U.S. company that is not subject to UK tax.</p> <p>C. <i>Contributions to R&D carried out by third party:</i> SMEs cannot claim for contributions to independent research, while large companies can do so.</p>
United States	F	<p>Federal research and experimentation tax credit:</p> <p>In-house research expenses and contract research expenses are eligible for relief. A contract research expense is 65% of any expense paid or incurred in carrying on a trade or business to any person, other than an employee of the taxpayer, for the performance on behalf of the taxpayer of qualified research, or services which, if performed by employees of the taxpayer would constitute qualified services within the meaning of section 41(b)(2)(B). Treas. Reg. § 1.41-2(e)(1). .</p>

*F=Funder, P=Performer

Notes: This table is based on country responses to the 2017 OECD R&D tax incentive survey.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017

Annex 4. Treatment of grant-funded R&D projects – terms governing R&D tax relief eligibility

Country	Terms and conditions
Australia	Refundable R&D tax offset: A claw back adjustment is introduced if the R&D entity receives a recoupment (including a grant) from an Australian government agency or State/Territory body that relates to R&D activities, unless the recoupment is received under Cooperative Research Centre program. When this happens, an extra 10% income tax is liable on the recoupment (subject to a cap equal to the R&D part of the grant). The extra income tax is payable on the year of the recoupment is received regardless of whether the related R&D tax offset benefit was used in the earlier/later income years.
Austria	R&D TC - Research premium: Grants and subsidies received by the taxpayer that are exempt from Austrian corporate income tax reduce the base for the research credit.
Belgium	R&D TC/TA and PWHTC: No details available.
Brazil	R&D TA : No details available.
Canada	Scientific Research and Experimental Development (SR&ED) investment tax credit: Government or non-government assistance reduces the pool of deductible SR&ED expenditures and qualified SR&ED expenditures for ITC purposes.
Czech Republic	R&D TA: R&D expenditures subsidized (e.g. grants) from public sources do not qualify for the enhanced R&D tax allowance. For a R&D project, the combination of direct and indirect (tax incentive) support is not allowed. Public universities and public research institutions do not use the R&D tax incentive generally. They focus on the direct public support of R&D.
Denmark	R&D TC for deficit related R&D expenditure: No details available.
France	R&D TC - Crédit d'Impôt Recherche (CIR): Under the terms of Article 244 quarter B III CGI, public subsidies received by enterprises for operations that qualify for the CIR (R&D Tax credit) are deducted from the base for calculating the credit whether they are repayable or not. <u>Exception:</u> Where the subsidies are repayable, they are added to the base for calculating the tax credit for the year during which they are repaid to the body that paid them. SSC exemption: The company can accumulate the JEI/JEU (young innovative firm/ young university firm) status with the CIR (research tax credit) and other innovation and employment subsidies.
Greece	R&D TA: No details available.
Hungary	R&D TC - Development Tax incentive : The tax credit may be applied together with cash grants. In case a beneficiary applies for another aid, such application has to be submitted simultaneously to the Ministry of Finance and to the other concerned Granting Authority. Furthermore, according to the decree, the beneficiary is required to submit annually in the tax return all relevant information for demonstrating that the rules on accumulation have been respected. The amount of total state aid is capped at a ceiling resulting from multiplying the amount of eligible costs by the intensity ratio defined according to the Regional Aid Map established by the EU Commission.
Iceland	R&D TC: Firms can receive tax support and other public sources for the same research or development project. There are limitations on the total amount of public funding. Total public funding of R&D, including tax deductions under 7 Article shall not exceed certain ratios of the eligible costs for the same research or development projects (cf. 15th Article. Act no. 152/2009 on support for innovation companies).
Ireland	R&D TC: Any expenditure which is met directly or indirectly by any grant aid or assistance from the State or any public or local authority or other agency of the State will not qualify for relief. Grants received towards qualifying R&D expenditure must be deducted from the costs included in a claim.
Italy	R&D TC: No details available.
Japan	R&D TC (volume-based and high R&D intensity): If a corporation receives a grant from the national government or local governments, the grant shall be included in the amount of gross profits for corporate income tax in principle. However, if the corporation acquires fixed assets with the subsidies suitable for its intended use, it may postpone taxation by reduction entry. Therefore, the receipt of an R&D grant affects the amount of deduction from gross income.
Korea	R&D TC: No details available.
Latvia	R&D TA: If a project is funded by a grant, it is not eligible for the R&D tax allowance
Lithuania	R&D TA: Eligible R&D expenditures must be reduced by the amount the R&D works were subsidised by state grants.
Mexico	R&D TC: This fiscal incentive may not be combined with any other preferential fiscal treatment or fiscal relief.
Netherlands	WBSO: No details available.
New Zealand	R&D loss TC: R&D funded by Government Grants is ineligible for this tax credit (e.g. if the business receives a 20% grant, 20% of that R&D would be ineligible)
Norway	R&D TC - SKATTEFUNN If the taxpayer has received public funding for the a project, the value of the tax credit and the grant are

	added in order to find out whether the highest permitted support under state aid rules have been surpassed. If this is the case, the tax credit is reduced down to the permitted support level.
Poland	R&D TA: The right to a deduction is lost if a taxpayer receives a refund of the expenditures in any form.
Portugal	R&D TC – SIFIDE II: Subsidies financed by the European Commission or Portuguese Government will deduct the eligible expenditure. Projects supported by Measures to Support R&D under the Portugal 2020 and Horizon 2020 will still eligible for SIFIDE.
Romania	R&D TA : No details available.
Russian Federation	R&D TA : No details available.
Slovak Republic	R&D TA (Tax relief for incentive recipients): Taxpayers can apply for cash grants. However, the amount of grants received will reduce the amount of R&D tax allowance. The maximum amount of incentives allowed (ceiling) includes the R&D subsidy (grant) and tax relief. Ceiling (including R&D grant): Basic research project: EUR 40 million; Applied research project: EUR 20 million; Feasibility study: EUR 7.5 million; Experimental development project: EUR 15 million. R&D TA (Super Deduction): The super deduction excludes expenses paid through government and public subsidies.
Slovenia	R&D TA: No details available.
Spain	R&D&I TC: The basis of the deduction will be reduced by the amount of subsidies received for the promotion of such activities if they are attributable as income in the tax period. SSC exemption : Not eligible for the benefit. Accelerated Depreciation for R&D Capital: All investment costs related to R&D activities are eligible, regardless of the source of funding of these activities.
Sweden	SSC exemption: Deduction can be made even if the employer receives: i. Public funding for their own research activities, e.g., from a county council or from Vinnova; and ii. Government grants to certain employees engaged in R&D, for example, in the form of subsidies. Entitlement to both regional reduction and research allowances is possible. However, it is not possible to deduct more regional consideration or research deduction than the balance after both reductions sufficient to pay old age pension contribution of 10.21% of the contribution base. Research deduction should be done first and then the calculation for the regional reduction that is left.
Turkey	R&D TA: Grants received from government entities, voluntary trusts and international funds in support of R&D activities are recorded in a special fund account instead of being classified as income and added to the tax base. SSC exemption: Grants received from government entities, voluntary trusts and international funds in support of R&D activities are recorded in a special fund account instead of being classified as income and added to the tax base.
United Kingdom	R&D TA (SMEs): If a company receives a subsidy or grant for an R&D project, this may affect how much tax relief it can claim. i. If the subsidy or grant is a 'state aid' recognised by the European Commission, the company cannot claim anything under the SME Scheme. ii. For other types of subsidy or grant, the R&D expenditure a company can claim for is reduced by the amount of subsidy or grant received. The company may be able to claim under the Large Company Scheme instead. iii. A company that has received grant or other form of support which is notified state aid for a project cannot subsequently repay this support in order to claim R&D relief. If a company receives an aid of less than EUR 200,000 over 3 years, this aid may qualify as De Minimis aid under the De Minimis Regulation. In this case, the company can claim SME R&D tax credits for costs within a project that are not funded by De Minimis aid. This means that a company cannot top up SME R&D tax credits with De Minimis aid. This rule applies only to project costs, not on a company basis. iv. SMEs receiving direct EU funding can claim SME R&D tax credits scheme for their own expenditure in the project including the payable tax credit if appropriate. In addition, relief on the EU grant can be claimed under the Large Company scheme and the RDEC. There is no reduction for grant or subsidy under the Large Company scheme. Research and Development Expenditure Credit (RDEC) Scheme (large companies): There is no reduction for grant or subsidy under the Large Company scheme. General measures that are not restricted to a specific group are not notified State aid, i.e., the Large company R&D tax credit scheme (for work until 31 March 2016, when this scheme was withdrawn), and the Research and Development Expenditure Credit Scheme (RDEC) (for work undertaken from 1 April 2013). A company in receipt of a notified aid can claim the large company tax relief or the RDEC. Companies can also claim for qualifying R&D costs funded by grant because there is no provision under the large company R&D tax credits scheme preventing subsidised expenditure from qualifying for R&D tax relief.
United States	Federal research and experimentation tax credit: Under section 41(d)(4)(H), a taxpayer may not claim a research tax credit if that research was "funded by any grant, contract, or otherwise by another person (or governmental entity)."

Notes: This table is based on country responses to the 2017 OECD R&D tax incentive survey.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Annex 5. Refundability terms and conditions in OECD countries, 2017

Country	Terms and conditions
Australia	Refundable R&D tax offset: from July 1 2016, for eligible entities with an aggregated turnover of less than \$20 million (unless controlled by tax exempt entities), the refundable tax offset entails a refund of 43.5 cents in the dollar for eligible R&D expenditure (at a company tax rate of 28.5 % for companies with an aggregated turnover of less than AUD 2m and 30% for all other companies). There is no ceiling on the amount of R&D expenditure that can be refunded. Payments made under the refundable R&D tax offset are exempt from tax.
Austria	R&D TC - Research premium: the benefit is refundable to the extent to which the credit exceeds the amount of the tax liabilities. The amount of refund is not limited. The premium is not taxable (no operating revenue).
Belgium	R&D TC: Carry-forward for four years (offset ceilings apply to carry-over amounts); the remainder part not used after five years is refunded. Refunded credits are not taxable.
Canada	Scientific Research and Experimental Development (SR&ED) investment tax credit: qualifying SMEs (CCPCs) can claim a 35% refundable tax credit on up to CAD 3m in qualifying R&D. R&D spending in excess of the expenditure limit is eligible for a 15% tax credit that is 40% refundable until the firm exceeds either the prior year taxable income or asset threshold of CAD 500k and CAD 10m respectively. Firms with insufficient tax liability that are not eligible for a full or partial refund of unused credits can carry those forward for a period of up to 20 years. Tax credits refunded are included in taxable income in the following year.
Denmark	R&D TC for deficit related R&D expenditure: immediate refund of 22% of any deficit related R&D expenses subject to ceiling on the value of R&D tax relief of DKK 5.5m. If the income year is less than 12 months, the tax credit is reduced proportionally. Tax credits paid out to firms are not included in taxable income.
France	R&D TC - Crédit d'Impôt Recherche (CIR): any excess constitutes a claim on the State which may be used to pay income tax payable in respect of the following three years; any non-deducted excess is returned at the end of the three-year period. The claim is reimbursed immediately with no ceiling to certain enterprises: new enterprises for five years, innovative young enterprises, enterprises in difficulty and to SMEs as defined in EU regulations. Refunded credits are not taxable.
Iceland	R&D TC: firms obtain a refund (cash payment) of unused claims if their profits are not high enough to offset or cancel out their tax liability. Refunded credits are not taxable.
Ireland	R&D TC: where there is insufficient Corporation Tax liability to use up all of the R&D tax credit - a company may claim a payable credit (depending on some restrictions and rules). This is not a refund of tax but rather a payable credit. Unused amounts are paid to the company over 3 years (three instalments) and are capped. The aggregate amount of payable credits in respect of R&D expenditure in an accounting period is subject to a limit that is the greater of: <ul style="list-style-type: none"> (i) the aggregate amount of Corporation Tax paid by the company for accounting periods ending in the ten years prior to the year preceding the accounting period concerned, reduced by any amounts of Payable R&D Credit claimed in respect of prior periods; OR (ii) the aggregate of payroll liabilities for the period concerned and the preceding accounting period (Payroll liabilities include amounts due to Revenue in respect of PAYE, PRSI and USC) reduced by the lesser of: <ul style="list-style-type: none"> a. any excess of aggregate payable R&D credit over aggregate payroll liabilities for all periods in respect of which a payable credit was claimed prior to the period in question; OR b. the payroll liabilities for the preceding period.
Italy	R&D TC: firms can offset earned tax credits against regional taxes (IRAP) and social security contributions, instead of their income tax liability, and carry forward any excess claims (R&D tax benefits are limited to EUR 20 million per year).
New Zealand	R&D loss TC: this tax credit allows business losses from eligible expenditure associated with R&D to be cashed out instead of being carried forward. Generally, tax losses are carried forward to the next income year. Losses that are cashed out are no longer available to apply against income in future years. For income years beginning on or after 1 April 2015, a taxpayer may be able to "cash out" (have refunded) up to 28% of any tax losses associated with eligible R&D activity if the company is resident in New Zealand. The amount a company can claim as a tax credit will be the lesser of <ul style="list-style-type: none"> i. NZD 800k, ii. the company's: net loss for the year x 28%, iii. total R&D expenditure for the tax year x 28%, or iv. total R&D labour expenditure for the year x 1.5 x 28%. <p>The R&D tax credit is not taxable. Loss making firms have to fulfil corporate eligibility and wage intensity criteria in order to qualify for the incentive. The cashed out payments should be repaid (and corresponding losses reinstated) when: the company makes a return on their investment by disposing of or transferring research and development assets; the company migrates; if the company is liquidated; the company amalgamates with another company; or if more than 90 percent of the company has been sold since the company first cashed out research and development tax losses. In all five cases the repayment amount will be reduced by income tax paid by the company from the time that losses were cashed out. The payment of</p>

Country	Terms and conditions
	income tax is a repayment of the cashed-out amount (because the company does not have the use of losses that have been extinguished to set off against that income). No further repayments will be required if the company has already derived sufficient taxable income to repay the balance of the cashed out amounts before one of these events occurs. http://taxpolicy.ird.govt.nz/publications/2015-commentary-arrdrm/research-and-development
Norway	R&D TC - SKATTEFUNN: the R&D TC is non-wastable (i.e. it is refundable). If the credit amount exceeds pre-credit corporate tax liability, the excess amount is paid to the taxpayer (consequently there are no carry-forward or carry-back provisions). Refunds are made one year after the tax year in which R&D costs were incurred. The credit is subject to an annual limitation per project per company. Own R&D (inclusive of R&D procured from entities other than approved R&D institutions, including units in the same enterprise group if the transaction is based on market prices): NOK 20 Million; Subcontracted R&D to approved R&D institutions: NOK 40 million. The sum of in-house and contracted R&D services may not exceed NOK 40 million. The R&D tax credit is not taxable.
Spain	Reduced, payable R&D&I TC (optional): In case of insufficient tax liability, the amounts not credited may be claimed in the next 15 tax periods, respecting the limit set coming from tax payable for the period. This period has increased to 18 years for tax periods beginning on or after January 1, 2012. As of 1 January 2013, if the taxpayer has generated the R&D tax credits that comply with certain specific requirements, the taxpayer may elect not to be subject to the annual limitation on tax credits (25%–50%) but apply the full tax credit with a 20% discount. With this option, taxpayers would limit the tax credit they apply up to 80% of the original amount they would have been entitled to credit to benefit from this alternative. In addition, as of 1 January 2013, a cash refund is available to taxpayers who are not able to utilize the full tax credit (with the 20% reduction) in the year after the tax credit was generated. The special rules enabling refunds of unutilized credits apply to taxpayers satisfying the following rules: • At least one year must pass from the end of the tax year in which the tax credit was generated but not utilized. • The average number of staff or the average number of staff involved in R&D and technological innovation must be maintained from the end of the tax period in which the tax credit is generated until the 24 months following the end of the period in which the corporate income tax return with the application or payment is filed. • An amount equivalent to the tax credit applied or paid (i.e., “cash refund”) must be invested in R&D and technological innovation for the same period mentioned in the previous bullet. • The company must obtain a pre-validation report on the qualification of the activity as R&D and technological innovation or a previous valuation agreement on the expenses and investment in these activities. With effect of 2015, the limit on the cash refund is raised from EUR 3m to 5m when the sum of R&D and technological innovation related expenses for companies with R&D expenditure exceeds 10% of their turnover (Bill of Spanish Corporate Income Tax Act 2014). Refunded credits are not taxable.
United Kingdom	R&D TA (SMEs): an SME may claim a payable R&D tax credit for an accounting period in which it has a surrenderable loss. For expenditure incurred on or after 1 April 2014 the amount of the payable tax credit that a company is entitled to for an accounting period is 14.5% of the surrenderable loss for that period (R&D expenditure qualifying for conversion to credits; up to 130% of qualifying expenditure on R&D). An R&D tax credit is not taxable income of the company. Research and Development Expenditure Credit (RDEC) Scheme (large companies): from 1 April 2015 relief is given at 11% of qualifying R&D expenditure. The tax credit is fully payable, net of tax, to companies with no CT liability.
United States	Payroll tax offset for certain start-ups: effective for tax years beginning after December 31, 2015, a so-called qualified small business may elect to apply a portion of its research credit—up to USD 250,000—against its payroll tax liability, instead of its income tax liability. For a qualified small business other than a partnership or S corporation, the amount elected is limited to current year credits that would otherwise be carried forward. To be eligible, a small business must have gross receipts for the tax year of less than USD 5 million, and no gross receipts for any tax years preceding the five-tax-year period ending with the tax year. That is, a taxpayer making this election for 2016 must not have had any gross receipts in a tax year preceding 2012. A small business that is not a corporation or partnership (such as a sole proprietor) must take into account the aggregate gross receipts the taxpayer receives in carrying on all its trades or businesses. For corporations and partnerships, the gross receipts and the credit limitation applies on a controlled group basis. https://home.kpmg.com/content/dam/kpmg/pdf/2016/02/tnf-us-068-feb15-2016.pdf https://www.congress.gov/114/plaws/publ113/PLAW-114publ113.pdf

Notes: This summary table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Annex 6. Limitation of R&D tax relief in OECD, EU and other major economies, 2017

A. Floors (minimum thresholds) and Ceilings

Country	R&D tax incentive	Ceilings and floors [in bold]	Notes
Amount of qualifying R&D expenditure			
Australia	R&D TC	AUD 100m [AUD 0.02m]	
Austria	R&D TC	EUR 1m (subcontracted R&D)	
Chile	R&D TC	15,000 UTM [100 UTM]	1 UTM ~approx. USD 69
China	R&D TA	80% of eligible costs (subcontracted R&D)	Per project
Denmark	R&D TC	DKK 25m	
France	R&D TC	EUR 10m (subcontracted R&D) • EUR 12 m if subcontracted to approved, public research organisations • EUR 2m if taxpayer is related to subcontractor	Per year and company
Hungary	SSC/VTC exemption	HUF 500k HUF 200k (Ph.D. student)	Gross wages per month
	R&D TC	[HUF 100m]	
Iceland	R&D TC	ISK 300m • ISK 450m if positive amount of purchased or collaborative R&D, [ISK 1m]	Per project and firm
Ireland	R&D TC	Greater of EUR 100k and 15% of total qualifying R&D expenditures (subcontracted R&D) • 5% if R&D activities are contracted to a university or institute	Per company and year
Italy	R&D TC	[EUR 30k]	
Norway	R&D TC	NOK 25m (intramural R&D) NOK 50m (purchased R&D) NOK 50m (intramural and purchased R&D)	Per year, project and firm
Portugal	R&D TC	EUR 1.5m (incremental R&D)	
Russian Federation	R&D TA	Other current costs may not exceed 75% of total R&D labour costs. Deductions to STI foundations may not exceed 1.5% of revenue.	
Slovak Republic	R&D TA (volume-based)	80% of eligible costs (experimental dev. and industrial research projects)	Increased to 95% under specific conditions.
Value of R&D tax relief			
Belgium	PWH TC	Tax deduction limited to PWH liability.	
France	SSC exemption	Tax deduction limited to SSC liability. The firm-level ceiling is a multiple – currently 5 – of the PASS (annual social security ceiling). Employee level ceiling has been kept constant at 4.5 times the minimum salary (SMIC).	• Amount of exempted social security contributions • Per company and year • Up to eight years as of foundation
		EUR 200k	• De minimis aid ceiling over three fiscal years
Hungary	R&D TA	HUF 50m (R&D collaboration)	
	R&D TC	80% of calculated corporate income tax ²³	Per year and beneficiary
	SSC/VTC exemption	Tax deduction limited to SSC liability.	
Italy	R&D TC	EUR 20m	Per year and beneficiary
Japan	Volume-based	25% of the corporation's national corporate income tax liability before the credit is applied. Temporary (until FY2018): up to extra 10%.	• In total, up to 40% of corporation's national corporate income tax liability can be deductible.

²³ According to the EC Regional Aid Map the maximum intensity ratio is 50% in Hungary (if the investment is realized in the most disadvantaged region of Hungary). Special rules apply for investments realized by SMEs and large investments, when the amount of the eligible expenses at present value is more than EUR 50 million. Small enterprises are eligible to raise the maximum intensity generally provided in their region by 20% and medium-sized firms can do the same by 10%. In case of large investments the limit is 50% of the maximum state aid intensity ratio for the value between EUR 50 million and EUR 100 million and 34% for the value above EUR 100 million.

Country	R&D tax incentive	Ceilings and floors [in bold]	Notes
	Collaborative R&D	5% of the corporation's national corporate income tax liability before the credit is applied.	
	High R&D intensity	10% of the corporation's national corporate income tax liability before the credit is applied.	
Korea	R&D TC	For large firms, TC capped at 3% of R&D spending.	Large firms (non-high potential, not part of Growth Industry and Basic Technology scheme)
Mexico	R&D TC	MXN 50 million	Per taxpayer and financial year.
Netherlands	PWH TC	Tax deduction limited to PWHT liability. Applicants may deduct a maximum of the proportionate amount of the unused R&D withholding tax credit from the payroll tax due in each tax period. If, for example, applicants decide that they will not deduct the R&D withholding tax credit in one or more tax periods or will not deduct the maximum amount, then the maximum they may deduct in the remaining tax periods will be higher.	Applicants can, for example, opt for this approach if they plan to recruit more employees during the course of the year or if their R&D project is temporarily delayed or halted and is restarted later in the year.
Russian Federation	SSC exemption	SSC rate is reduced from 30% to 10% until 2017. Some categories of organization have a right for reduced these rates. Among them there are: - SMEs founded by universities or research institutes (e.g. start-ups); - IT companies (meeting certain operational requirements); - organisations providing engineering services. The scheme is applicable for educational and R&D performing organisations, SMEs founded by universities or research institutes (e.g. start-ups) and IT companies (meeting certain operational requirements). For such organizations are used the rate 10% until 2017: for Pension Fund 4% (8% in 2015), for Social Insurance Fund 2 %, for Federal Compulsory Medical Insurance Fund 4 %. This corresponds to an exemption of 66.66% of social security contributions.	Social security contributions in Russia are compulsory payments paid to general government which confer entitlement to receive a (contingent) future social benefit. Payers of obligatory contributions are organisations (legal entities) that pay social security taxes equal to 30% of total annual salaries of their employees of which 22% goes to the Pension Fund, 2.9% to the Social Security Fund and 5.1% to the Federal Compulsory Medical Insurance Fund.
Slovak Republic	R&D TA (volume-based)	<ul style="list-style-type: none"> EUR 7.5m Feasibility studies EUR 15m Experimental dev. EUR 20m Applied Research EUR 40m Basic research 	<ul style="list-style-type: none"> Per project. Ceiling relates to sum of R&D grant and tax relief.
	R&D&I TC	25% of gross tax liability if the amount of R&D tax relief equals or is less than 10% of the tax due <ul style="list-style-type: none"> 50% if tax relief is more than 10% of tax due 	
Spain	SSC exemption	A bonus of 40% is established in business contributions to Social Security contributions for certain research personnel. Eligible workers are those in the groups 1,2,3 and 4 of the Contributions to the General Social Security Scheme who have dedicated all their working time to R & D + i (as defined in art . 35 Corporation Tax Act).	This scheme is fully compatible with R&D&I tax credit only in the case of "innovative SMEs".
Sweden	SSC exemption	SEK 230k <ul style="list-style-type: none"> The resulting SSC after the deduction must be at least equal to the old age pension contribution of 0.1021 of the salary 	Per month and company.
	R&D TA	50% of total tax incentive amount (subcontracted R&D)	50-50 % split tax relief among contracting firm and R&D service provider.
Turkey	SSC exemption	An allocation equivalent to 50% of employer social security contributions is provided by the Ministry of Finance until 2023. The full-time equivalent support personnel benefiting from the SSC reduction cannot exceed 10%	

Country	R&D tax incentive	Ceilings and floors [in bold]	Notes
		of the number of total full-time personnel.	
United Kingdom	R&D TA (SMEs)	<ul style="list-style-type: none"> • EUR 7.5m • <i>Subcontracted R&D</i> • If connected subcontractor, lower of: <ul style="list-style-type: none"> – payment made to subcontractor; or – relevant expenditure of subcontractor. • If unconnected subcontractor, 65% of subcontracted R&D costs. 	Per project.
United States	R&D TC	Taxpayer's net income tax less the greater of the taxpayer's tentative minimum tax liability (TMT) or 25% of net regular tax liability above USD 25k. For qualified small business, the TMT is treated as zero, the limitation based on regular tax liability still applies.	
Refund-specific ceiling or discount			
Canada	R&D TC (CCPCs)	R&D tax credit fully refundable at enhanced rate of 35% until CAD 3m expenditure limit. R&D spending in excess of CAD 3m expenditure limit is eligible for a 15% tax credit that is 40% refundable for CCPCs below phase-out range (below CAD 500k in prior year taxable income and below CAD10m in prior year capital); else no refund.	Refundability applicable until the firm exceeds either CAD 500k of prior year taxable income or a CAD 10m asset threshold.
Denmark	R&D TC	A 25 million R&D expenditure ceiling applies. Refund limited to DKK 5.5m per year (22% of DKK 25m.)	Tax credit applicable in loss/deficit position. Immediate refund of 22% of any deficit related R&D expenses. If the income year is less than 12 months, the tax credit is reduced proportionally.
Ireland	R&D TC	Limited to the greater of: <ul style="list-style-type: none"> • the aggregate amount of CIT paid in the ten preceding fiscal years, reduced by Payable R&D Credit claimed in respect of prior periods; OR • the aggregate of current and preceding accounting periods payroll liabilities reduced by the lesser of: <ul style="list-style-type: none"> – any excess of aggregate payable R&D credit over aggregate payroll liabilities for all periods in respect of which a payable credit was claimed prior to the period in question; OR – the payroll liabilities for the preceding period. 	Per company and year
New Zealand	R&D TC	28% of any tax losses associated with eligible R&D expenses if resident in New Zealand. Refund limited to the smallest of the product of the corporate tax rate (28%) and i. NZD 1.1 million; ii. company's net loss for the year; iii.- company's R&D expenditure for the tax year; iv. company's R&D labour expenditure for the year, multiplied by 1.5. The cashed out payments should be repaid (and corresponding losses reinstated).	Loss making firms have to fulfil corporate eligibility and wage intensity criteria in order to qualify for the incentive. The first cap of NZD 500k increases by 300k for the next five years after 2015. In tax year 2020-2021, the cap will be maintained at NZD 2m.
Spain	R&D&I TC	Immediate refund of credit without the application of the established ceilings at a reduction of 20% of the credit. The limit on the cash refund is raised from EUR 3m to 5m when the sum of R&D expenses exceeds 10% of their turnover	
United Kingdom	R&D TA (SMEs)	14.5% of surrenderable loss	
United States	R&D TC	Payroll tax offset up to USD 250k for qualified small business (certain start-ups). Tax deduction limited to PWHT liability.	

B. Threshold-dependent credit rates

Country	R&D tax incentive	Threshold	Rate below	Rate above
Canada	R&D TC	CAD 3m (CCPCs)*	35%	15%
France	R&D TC	EUR 100m	30%	5%
Netherlands	PWH TC	EUR 350k	32% (40% for start-ups)	16%

* Expenditure limit of CAD 3m is reduced according to a function of taxable income and taxable capital.

C. Base amounts (incremental R&D tax incentives)

Country	Definition of Base amount
Czech Republic	R&D TA: Total expenditure on R&D in the previous year
Italy	R&D TC (Legge di Stabilità 2015, 2017): Average R&D investment in the period 2012-2014.
Japan	High R&D intensity TC: 10% of the "average annual turnover" in the past business years that started within the last three years prior to the first day of the business year
Korea	Hybrid R&D tax credit: Taxpayer's R&D expenditures in the preceding year
Mexico	R&D TC: Average of taxpayer's R&D expenditures in the preceding three years.
Portugal	Incremental tax offset (SIFIDE II tax credit): Average expenses in the previous two fiscal years.
Slovak Republic	R&D TA (Hybrid): R&D costs incurred in the immediately preceding taxation period.
Spain	R&D&I TC: average of taxpayer's R&D expenditures in the preceding two years.
Turkey	R&D TA: R&D expenditures in the previous year.
United States	<ul style="list-style-type: none"> – Regular Research Credit (RRC): Product of fixed base percentage (ratio of research expenses to gross receipts for 1984-1988 period, modified rule for start-up companies²⁴; ratio capped at 16%) and average annual gross receipts (reduced by returns and allowances) over the four preceding years – Credit for Basic Research: The sum of (a) the greater of two minimum basic research floors plus (b) an amount reflecting any decrease in non-research giving to universities by the corporation as compared to such giving during a fixed-base period, as adjusted for inflation. – Alternative Simplified Credit (ASC): 50 percent of the average qualified R&D expenditure for the three preceding taxable years. If a taxpayer has no qualified R&D expenditure in any of the three preceding taxable years (base amount of zero, i.e. TC applies on the volume rather than incremental part of qualified R&D expenditure), the headline ASC rate of 14% is reduced to 6%.

Notes: This summary table is limited to expenditure-based R&D tax incentives for the business sector (excluding accelerated depreciation provisions) and does not cover sub-national or income-based R&D tax incentives. Some countries have more than one R&D tax incentive scheme. No details available for Malta and Israel.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

²⁴ A start-up company is a taxpayer that had both gross receipts and qualified research expenses either: (i) for the first time in a tax year beginning after 1983, or (ii) for fewer than 3 tax years beginning after 1983 and before 1989. For the first 5 tax years beginning after 1993 for which a start-up company has qualified research expenses, the percentage is 3%. The fixed-base percentage is gradually adjusted throughout the 6th and 10th tax years, and for the 11th and later tax years beginning after 1993, the fixed-base percentage equals the ratio of total qualified research expenses to total gross receipts for any 5 of the 5th through 10th such tax years. <https://www.irs.gov/pub/irs-pdf/i6765.pdf>

Annex 7. Aggregation rules applied in computing R&D tax benefits, 2017

Country	Details
Australia	Consolidated groups: apply as a single taxpayer. R&D partnerships: Each partner claims.
Austria	No details.
Austria	No details.
Belgium	No details.
Canada	The expenditure limit is a decreasing function of the taxable income of the previous year and taxable capital of the CCPC and associated corporations (if any). To compute taxable income, total taxable income and taxable capital is aggregated for all CCPC and associated corporations.
Czech Republic	No details.
Denmark	Group of companies: A joint assessment is made. Taxable income is required to be negative at the group level.
France	The R&D tax credit is calculated and declared at each level of a consolidated group. The parent company receives the R&D tax credit generated by the group members and can offset it against the CIT liability of the consolidated group.
Greece	No details.
Hungary	No details.
Iceland	No details.
Ireland	For relevant periods commencing before 1 January 2015, qualifying group expenditure for a relevant period is the excess group expenditure on R&D activities in that relevant period over the threshold amount for that group. For accounting periods commencing on or after 1 January 2015, it is no longer necessary to adjust for the base year (2003) expenditure in the computation of the R&D tax credit. "Threshold amount" is defined in relation to a relevant period of a group of companies; however the concept also applies to a single company.
Italy	No details.
Japan	R&D tax credit is calculated at the consolidated level, not on individual companies.
Korea	No details.
Latvia	No rules for aggregation if companies are part of a group. General regulation on increase of taxable income is applied if services or goods are sold / bought between companies of a group for non-market prices.
Lithuania	Not applicable.
Netherlands	No details.
New Zealand	A company which is a part of a group of companies may still be eligible as long as the company meets the criteria of eligible taxpayer (i-vi) and the group as a whole: (i) is in a tax loss position, and (ii) the R&D wage intensity calculation is based on the entire group's total R&D labour expenditure, divided by the total labour expenditure for the entire group. If a company is a part of a group for tax purpose, then that group must have a net loss for the corresponding tax year and meet the wage intensity criteria. The "R&D" group is defined and can include a company, look-through company or limited partnership.
Norway	Caps are applicable for each individual taxpayer, disregarding ownership. Thus, if a holding company has three subsidiaries, each of the three companies may benefit, up to the cap for each company.
Portugal	No details.
Romania	Tax incentives for R&D activities are granted separately for each project.
Russian Federation	No details.
Slovak Republic	No details.
Slovenia	No details.
Spain	Cash refund limits to the entire group of companies shall apply in the case of entities in the same group according to the criteria set out in Article 42 of the Commercial Code, regardless of their residence and the obligation to prepare consolidated financial statements.
Turkey	No details.
United Kingdom	Aggregation rules are in place just to avoid misclassifications of SMEs and large enterprises, but not explicitly for the distribution of R&D.
United States	Section 41(f)(1) requires that all members of the same controlled group (greater than 50% control), and all trades or businesses under common control, be treated as a single taxpayer.

Notes: This table is based on country responses to the 2017 OECD R&D tax incentive survey.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Annex 8. Definitions of qualified SMEs, start-ups and young firms, 2017

Small and Medium Enterprises (SMEs)	
Australia	<p>The definition of SME applicable for R&D tax incentive purposes is: Firms are eligible to claim the corresponding refundable tax offset if both of the following apply:</p> <ol style="list-style-type: none"> 1. the firm is not controlled by one or more exempt entities; and 2. the firm's aggregated turnover is less than AUD 20m. <p>https://www.ato.gov.au/Business/Research-and-development-tax-incentive/Eligibility/Eligible-entities/</p>
Canada	<p>The definition of Small firm ~ CCPC (Canadian-Controlled Private Corporation) is:</p> <ol style="list-style-type: none"> 1. a private corporation; 2. a corporation that was resident in Canada and was either incorporated in Canada or resident in Canada from June 18, 1971, to the end of the tax year; 3. not controlled directly or indirectly by one or more non-resident persons; 4. not controlled directly or indirectly by one or more public corporations (other than a prescribed venture capital corporation, as defined in Regulation 6700); 5. not controlled by a Canadian resident corporation that lists its shares on a designated stock exchanges outside of Canada; 6. not controlled directly or indirectly by any combination of persons described in the three previous conditions; 7. if all of its shares that are owned by a non-resident person, by a public corporation (other than a prescribed venture capital corporation), or by a corporation with a class of shares listed on a designated stock exchanges, were owned by one person, that person would not own sufficient shares to control the corporation; and 8. no class of its shares of capital stock is listed on a designated stock exchange. <p>http://www.cra-arc.gc.ca/tx/bsnss/tpcs/crprtns/typs-eng.html</p>
France	<p>The definition of SME is in accordance with the EU definition: "A firm with:</p> <ol style="list-style-type: none"> 1) less than 250 employees; 2) a turnover less than EUR 50m or an annual balance sheet total not exceeding EUR 43m; 3) the ceilings apply to the figures for individual firms." <p>https://www.insee.fr/fr/metadonnees/definition/c1962 http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_fr</p>
Japan	<p>The definition of SME is:</p> <ol style="list-style-type: none"> 1. corporations whose stated capital or equity investment does not exceed JPY 100m; 2. corporations without stated capital nor equity investment where the number of persons employed regularly does not exceed a thousand; 3. self-employed persons who hire other persons regularly and do not exceed a thousand; 4. agricultural cooperatives; and 5. not controlled by large corporations (independent). <p>http://www.nta.go.jp/taxanswer/hojin/5442.htm</p>
Korea	<p>The definition of SME in Korea varies across industry sectors and for tax purposes. In general, SMEs:</p> <ol style="list-style-type: none"> 1. employ less than 1000 workers; 2. have total assets less than KRW 500b; 3. have less than KRW 100b in equity capital; 4. have an average of three last year's sales less than KRW 150b; and 5. are independent. <p>http://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=22787&type=part&key=28 http://elaw.klri.re.kr/eng_mobile/viewer.do?hseq=22788&type=part&key=28</p>
Norway	<p>The definition of SME is in accordance with the EU definition: "A firm with:</p> <ol style="list-style-type: none"> 1) less than 250 employees; 2) a turnover less than EUR 50m or an annual balance sheet total not exceeding EUR 43m; 3) the ceilings apply to the figures for individual firms." <p>https://lovdata.no/dokument/SF/forskrift/1999-11-19-1158/KAPITTEL_16-5#KAPITTEL_16-5 http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_fr</p>
Poland	<p>The definition of SME is in accordance with the EU definition: "A firm with:</p> <ol style="list-style-type: none"> 1) less than 250 employees; 2) a turnover less than EUR 50m or an annual balance sheet total not exceeding EUR 43m (both amounts expressed in PLN); 3) the ceilings apply to the figures for individual firms." <p>https://ec.europa.eu/digital-single-market/en/news/ustawa-z-dnia-2-lipca-2004-r-o-swobodzie-dzia%C5%82alno%C5%9Bci-gospodarczej-act-freedom-business http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_fr</p>
Portugal	<p>The definition of SME is in accordance with the EU definition: "A firm with:</p> <ol style="list-style-type: none"> 1) less than 250 employees; 2) a turnover less than EUR 50m or an annual balance sheet total not exceeding EUR 43m; 3) The ceilings apply to the figures for individual firms." <p>https://www.iapmei.pt/getattachment/PRODUTOS-E-SERVICOS/Qualificacao-Certificacao/Certificacao-PME/Decreto-Lei-372-2007.pdf.aspx http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_fr</p>

Spain	<p>The definition of SME is in accordance with the EU definition. An Innovative SMEs also:</p> <ol style="list-style-type: none"> Has received public funding in the last three years, without undergoing revocation due to an incorrect or insufficient implementation of the funded activity, through public calls under: <ul style="list-style-type: none"> the Sixth National Plan for Scientific Research, Development and Technological Innovation, the State Scientific and Technical Research and Innovation Support for the realization of R+D+i, the Center for Industrial Technological Development and d. the 7th Framework Programme for R+D+i of the Horizon 2020 Programme of the EU. Has proved its innovative nature through their own activity by: <ul style="list-style-type: none"> having a patent itself in operation over a period not exceeding five years preceding the exercise of application to the deduction; having obtained in the three years prior to the application for the deduction a reasoned binding and positive report allowing the company to apply for the deduction. Has demonstrated its capacity for innovation, through one of the following recognized certifications: <ul style="list-style-type: none"> Young Innovative Company (JEI), according to the specification AENOR EA0043; Innovative small or micro enterprise according to specification AENOR EA0047; Certification according to the UNE 166.002 "Management Systems R & D + i". <p>https://www.boe.es/boe/dias/2014/06/14/pdfs/BOE-A-2014-6276.pdf http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_fr</p>
United Kingdom	<p>The definition of SME is: A company with less than 500 employees and revenues less than EUR 100m or gross assets less than EUR 86m. A company may not be considered to be a SME if it is part of a larger enterprise that, taken as a whole, would fail these tests.</p> <p>https://www.gov.uk/guidance/corporation-tax-research-and-development-tax-relief-for-small-and-medium-sized-enterprises</p>
United States	<p>An eligible small business is a non-publicly traded corporation, a partnership, or a sole proprietorship, if the average annual gross receipts for the three-tax-year period preceding the credit year do not exceed USD 50 million.</p> <p>In determining gross receipts, rules similar to those of section 448(c), paragraphs (2) and (3), apply:</p> <ol style="list-style-type: none"> All persons treated as a single employer under section 52(a) and (b) or section 414 (m) or (o) are treated as one person. If the small business was not in existence for the entire three-year period, then the gross receipts requirement is applied on the basis of the period during which such entity was in existence. For a short tax year, gross receipts are annualized by multiplying the gross receipts for the short period by 12 and dividing the result by the number of months in the short period. Gross receipts for any tax year is reduced by returns and allowances made during such year. <p>Furthermore, for a partnership or S corporation, the gross receipts test must be met both by the entity and by the partner or shareholder for the tax year.</p> <p>https://www.gpo.gov/fdsys/pkg/USCODE-2015-title26/pdf/USCODE-2015-title26-subtitleA-chap1-subchapA-partIV-subpartD-sec38.pdf https://www.gpo.gov/fdsys/pkg/USCODE-2015-title26/pdf/USCODE-2015-title26-subtitleA-chap1-subchapE-partII-subpartA-sec448.pdf</p>
Start-ups	
Netherlands	<p>The following criteria determine whether a firm is deemed to be a Start-up company:</p> <ol style="list-style-type: none"> number of years in which the company has employed personnel or number of years in which the applicant has been an entrepreneur: <ul style="list-style-type: none"> a company can be deemed to be a start-up company when the company did not act as a withholding agent in at least one of the previous five calendar years. That is, the applicant has employed personnel for a maximum of four calendar years. Self-employed persons may have acted as entrepreneurs for a maximum of four of the past five calendar years. Neither of the aforementioned periods need to be consecutive periods; the number of years in which the company has been issued an R&D Declaration: <ul style="list-style-type: none"> The applicant can be deemed to be a start-up company or entrepreneur for a maximum of three years. When the applicant has been issued R&D Declarations in three or more of the past five years then the applicant no longer qualifies for the start-up status. This does not need to be a consecutive period. Each calendar year in which the applicant was issued one or more R&D Declarations then counts as one year. When specific conditions are met, the R&D Declarations issued to a company that preceded the company are also taken into account. This is determined by the continuation and ownership structure criteria that are explained below; whether the company continues the activities from another company owned by the applicant (continuation of activities): <ul style="list-style-type: none"> If the company took over activities from another company or has done so in the past, it is deemed to constitute the continuation of a company. When this is the case, the R&D Declarations issued to that other company may in some instances be taken into account when determining the start-up status of the company. This is determined by the ownership structure of the company. <p>http://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/winst/inkomstenbelasting/inkomstenbelasting_voor_ondernemers/ondernemersaftrek/aftrek_voor_speur_en_ontwikkelingswerk</p>
Portugal	<p>The definition of Start-up is a SME company, according to the EU regulation, that has not yet completed two fiscal exercises and that did not benefit from the incremental rate.</p> <p>http://sifide.adi.pt/index.php?cat=30#reconhecidas</p>

United States	<p>The definition of Certain start-ups is: small businesses that have gross receipts for the tax year of less than USD 5 million, and no gross receipts for any tax years preceding the five-tax-year period ending with the tax year. A small business that is not a corporation or partnership (such as a sole proprietor) must take into account the aggregate gross receipts the taxpayer receives in carrying on all its trades or businesses. For corporations and partnerships, the gross receipts and the credit limitation applies on a controlled group basis.</p> <p>https://www.gpo.gov/fdsys/pkg/USCODE-2015-title26/pdf/USCODE-2015-title26-subtitleA-chap1-subchapA-partIV-subpartD-sec41.pdf</p>
Young firms	
Belgium	<p>A Young Innovative Company (YIC) must meet the requirements of a small company. Especially, it may not exceed more than one of the following criteria:</p> <ol style="list-style-type: none"> 1) an annual average of 50 employees; 2) an annual turnover (excluding VAT) of EUR 7.3m; 3) total assets of EUR 3.65m (unless annual average workforce exceeds 100 employees). <p>In addition, a YIC must:</p> <ol style="list-style-type: none"> 1) be younger than 10 years old; 2) not be created in the context of a merger, restructuring, extension of a previous activity or acquisition of such activities; 3) use at least 15% of the total cost of the previous tax period for R&D activities; <p>The YIC must meet those conditions at the end of the previous taxable year preceding the taxable year during which salaries are paid.</p> <p>http://www.belspo.be/belspo/fisc/profit_YIC_nl.stm</p>
France	<p>Young Innovative Companies (Jeune Entreprise Innovante - JEI) must:</p> <ol style="list-style-type: none"> 1) be a SME according to the EU regulation; 2) be younger than 8 years old; 3) have an investment on R&D of at least 15% of all fiscally deductible expenditures; 4) be truly independent (at least 50% of the capital hold by individuals, other YEI, foundations with public utility and scientific purpose, associations, or research centers, not resulting from restructuring). <p>Young University Companies (Jeune Entreprise Universitaire - JEU) must:</p> <ol style="list-style-type: none"> 1) be a SME according to the EU regulation; 2) be younger than 8 years old; 3) be independent (more than 50% of capital hold by individuals, public associations with scientific objectives or research centres); 4) be genuinely new (not resulting from concentration, restructuring, or from the extension of a pre-existing activity); 5) be managed or owned by at least a 10% by students, PhD or master holders having graduated less than 5 years ago, or people with teaching or research activities. Furthermore, it must have established a connection with a higher education institution. <p>http://www.enseignementsup-recherche.gouv.fr/cid5738/le-statut-de-la-jeune-entreprise-innovante-jei.html http://www.enseignementsup-recherche.gouv.fr/cid67053/j.e.u.-jeune-entreprise-universitaire.html</p>

Notes: This table is based on country responses to the 2017 OECD R&D tax incentive survey and publicly available sources.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, December 2017.

Annex 9. Parameters feeding into B-index calculation, 2017

Note: Incremental tax credit (allowance) rates are expressed in net terms, i.e. apply on top of volume based incentives, if applicable.

Enhanced tax treatment								Baseline tax treatment		
Country	R&D tax incentive Eligible R&D	R&D TC/TA rates Large/SME (%)	CIT rate Large/SME (%)		Carry-over (years)	Refundability (payable credit)	Thresholds and ceilings	Current (expensing)	M&E (SL or DB)	B&L (SL or DB)
Australia	R&D TC	38.5/43.5 (gross)	30	27.5	Indefinite	SMEs only	R&D expenditure (floor and threshold)	100	20 (SL)	2.5 (SL)
Austria	R&D TC	12/12	25	25	No	Yes	R&D expenditure (subcontracted)	100	20 (SL)	4 (SL)
Belgium	<ul style="list-style-type: none">R&D TCPWH TC	<ul style="list-style-type: none">4.6/4.680/80	33.99	33.99	<ul style="list-style-type: none">4n.a.	<ul style="list-style-type: none">YesRWS	<ul style="list-style-type: none">NoNo	100	acc: 33.3 (SL)	5 (SL)
Brazil	R&D TA	60/60; *70 / 80 (up to/more than 5% R&D staff growth per year); +20 (patent/ cultivar registration)	34	24	No	No	No	100	acc: 100 (SL)	10 (SL)
Bulgaria	No R&D tax incentive		10	10	-	-	-	100	30 (SL)	4 (SL)
Canada	R&D TC	15/35(15)	26.70	14.48	20	CCPCs only	R&D expenditure (CCPCs only)	100	up to 55 (DB)	10 (DB)
Chile	R&D TC	35 (net: 26.6)/ 35 (net:26.6)	25	25	Indefinite	No	R&D expenditure (floor and ceiling)	65 (100)	acc:100 (SL)	20 (SL)
China	R&D TA	50/50	25	25	5	No	R&D expenditure (subcontracted)	100	acc:100 (SL)	20 (SL)
Croatia	No R&D tax incentive		18	18	-	-	-	100	50 (SL)	10 (SL)
Cyprus	No R&D tax incentive		12.5	12.5	-	-	-	100	20 (SL)	7 (SL)
Czech Republic	R&D TA	Volume: 100/100 Increment: 10/10	19	19	3	No	No	100	20 (SL)	3.33 (SL)
Denmark	R&D TC (deficit)	22/22	22	22	No	Yes	R&D expenditure	100	acc:100 (SL)	4 (SL)
Estonia	No R&D tax incentive		20	20	-	-	-	n.a.	-	-
Finland	No R&D tax incentive		20	20	-	-	-	100	25 (DB)	20 (DB)
France	<ul style="list-style-type: none">R&D TCSSC exemption	<ul style="list-style-type: none">30(5)/30(5)n.a./100	34.43	34.43	<ul style="list-style-type: none">3n.a.	<ul style="list-style-type: none">Immediate (SME); after 3 years (large companies)RWS	<ul style="list-style-type: none">R&D ExpenditureR&D tax relief	100	acc:40 (DB)	5 (SL)
Germany	No R&D tax incentive		30.175	30.175	-	-	-	100	12.5 (SL)	3 (SL)
Greece	R&D TA	30/30	29	29	5	No	No	100	33 (SL)	8 (SL)

Enhanced tax treatment								Baseline tax treatment		
Country	R&D tax incentive Eligible R&D	R&D TC/TA rates Large/SME (%)	CIT rate Large/SME (%)		Carry-over (years)	Refundability (payable credit)	Thresholds and ceilings	Current (expensing)	M&E (SL or DB)	B&L (SL or DB)
Hungary	<ul style="list-style-type: none">• R&D TA• SSC exemption	<ul style="list-style-type: none">• 100/100• 100/100	9	9	<ul style="list-style-type: none">• 5• n.a.	<ul style="list-style-type: none">• No• RWS	<ul style="list-style-type: none">• Tax relief (collab.)• R&D expenditure	100	33 (SL)	2 (SL)
Iceland	R&D TC	20/20	20	20	No	Yes	R&D expenditure (floor and cap)	100	10 (SL)	2 (SL)
Ireland	R&D TC	25/25	12.5	12.5	Indefinite	Yes	R&D expenditure (subcontracted)	100	acc: 100 (SL)	acc:100 (SL)
Israel	No details available		24	24	-	-	-	-	-	-
Italy	R&D TC	Increment: 50	27.81	27.81	Indefinite	Yes (IRAP, RWS)	R&D expenditure (floor) and R&D tax relief	100	10 (SL)	3 (SL)
Japan	R&D TC (volume)	6-14/12-17	29.97	21.42	No	No	R&D tax relief	100	50 (DB)	2 (SL)
Korea	<ul style="list-style-type: none">• Hybrid R&D TC• R&D TC Investment	<ul style="list-style-type: none">• Volume: 3/25• Increment: 30/50• 1/6	24.2	11	<ul style="list-style-type: none">• 5• 5	<ul style="list-style-type: none">• No• No	<ul style="list-style-type: none">• R&D tax relief• No	100	20 (SL)	20 (SL)
Latvia	R&D TA	200/200	15	15	Indefinite	No	No	100	40 (DB)	15 (DB)
Lithuania	R&D TA	200/200	15	15	Indefinite	No	No	100	acc:50 (SL)	12.5 (SL)
Luxembourg	No R&D tax incentive		27.08	27.08	-	-	-	100	40 (DB)	5 (SL)
Malta	No details available		35	35	-	-	-	-	-	-
Mexico	R&D TC	Increment: 30/30	30	30	-	-	-	100	0.89 (1 year)	0.74 (1 year)
Netherlands	PWH TC	32(16)/32 (16)	25	20	n.a.	RWS	R&D tax relief	100	20 (SL)	4 (SL)
New Zealand	R&D TC (deficit)	28/28	28	28	No	Yes	R&D tax relief	100	22 (DB)	4 (DB)
Norway	R&D TC	18/20	24	24	No	Yes	R&D expenditure	100	20 (DB)	4 (DB)
Poland	R&D TA	30(10)/30(20) Labour (other qualified R&D expenditure)	19	19	3	No	No	100	acc:100 (SL)	acc:100 (SL)
Portugal	R&D TC	Volume: 32.5/32.5 Increment: 50/50.	22.5	22.5	8	No	R&D expenditure (incremental offset)	100	25 (SL)	5 (SL)
Romania	R&D TA	50/50	16	16	7	No	No details available	100	acc: 8.33 (SL)	2.5 (SL)
Russian Federation	R&D TA	50/50	20	20	10	No	No	100	acc: 50 (SL)	acc: 10 (SL)
Slovak Republic	R&D TA Hybrid	Volume: 50(25)/50(25) For labour (other qualified R&D); Increment: 25/25	21	21	4	No	-	100	25 (SL)	5 (SL)

Country	Enhanced tax treatment							Baseline tax treatment		
	R&D tax incentive Eligible R&D	R&D TC/TA rates Large/SME (%)	CIT rate Large/SME (%)		Carry-over (years)	Refundability (payable credit)	Thresholds and ceilings	Current (expensing)	M&E (SL or DB)	B&L (SL or DB)
Slovenia	R&D TA	100/100	19	19	5	No	No	100	20 (SL)	3 (SL)
South Africa	R&D TA	50/50	28	28	Indefinite	No	No	100	50 - 30 - 20 (SL)	5 (SL)
Spain	R&D&I TC	Volume: 25(8)/25(8) Current R&D (M&E) Increment: 17/17	25	25	18	Yes (20% discount)	R&D tax relief	100	acc:100 (SL)	10 (SL)
Sweden	SSC exemption	10/10	22	22	n.a.	RWS	R&D tax relief, Minimum pension contribution requirement	100	30 (DB)	4 (SL)
Switzerland	No R&D tax incentive		21.15	21.15	-	-	-	100	40 (DB)	8 (DB)
Turkey	<ul style="list-style-type: none"> • R&D TA • SSC exemption 	<ul style="list-style-type: none"> • Increment: 50/50 • 50/50 	20	20	<ul style="list-style-type: none"> • Indefinite • n.a. 	<ul style="list-style-type: none"> • No • RWS 	<ul style="list-style-type: none"> • R&D tax relief (subcontracted) • R&D personnel 	100	40 (DB)	4 (SL)
United Kingdom	<ul style="list-style-type: none"> • R&D TA (SMEs) • R&D TC (Large firms) 	<ul style="list-style-type: none"> • n.a./130 • 11/n.a. 	19	19	<ul style="list-style-type: none"> • Indefinite • Indefinite 	<ul style="list-style-type: none"> • Yes • Yes 	<ul style="list-style-type: none"> • Tax relief (SMEs) • No 	100	acc:100 (SL)	acc:100 (SL)
United States (federal)	R&D TC	Increment: RRC: 20/20; ASC: 14 or 6*/14 or 6* *no qualified R&D expenses in any of previous 3 years	35	35	20	Only SMEs (RWS)	Tax relief	100	20 (SL)	2.56 (SL)

Notes: R&D tax credit and enhanced R&D tax allowance rates are reported for large companies and SMEs, excluding SME subgroup specific rates (e.g. for innovative SMEs) available only in few countries. Baseline/standard tax treatment provisions are reported for current and capital expenditure with the exception of countries that provide accelerated ("acc.") depreciation rates for machinery and equipment and/or buildings and land if used within the context of an R&D project.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, March 2018.

Annex 10. Notes on the B-index calculation

General notes

- This is an experimental indicator based on quantitative and qualitative information representing a notional level of tax subsidy rate under different scenarios. It requires a number of assumptions and calculations specific to each country. International comparability may be limited.
- The tax subsidy rate is calculated as 1 minus the B-index, a measure of the before-tax income needed to break even on USD 1 of R&D outlays (Warda, 2001). It is based on responses from national finance/tax/innovation authorities and R&D statistical agencies to the OECD questionnaire on R&D tax incentives and also draws on other publicly available information.
- As a measure of the marginal cost of R&D to users, the B-index is estimated based on marginal tax credit (allowance) rates. Whenever caps and thresholds applied to eligible R&D expenditure or the amount of R&D tax relief, an attempt was made to compute weighted marginal tax credit (allowance) rates for SMEs and large firms, using available data or proxy measures for the distribution of eligible R&D spending. Weighted marginal tax credit rates reflect the magnitude of marginal tax credit rates applicable to an extra unit of R&D spend across the firm population (e.g. SMEs or large enterprises). They are likely to differ from average tax subsidy rates as companies may surpass established R&D expenditure or R&D tax relief thresholds (cap).
- Estimates allow for differences in the treatment of the various components of R&D expenditures: current (labour, other current) and capital (machinery and equipment, facilities/buildings) expenditures. A common 60:30:5:5 percentage distribution of labour, other current, machinery and equipment, and building expenditures is applied based on average estimates for OECD countries (www.oecd.org/sti/rds).
- Benchmark tax data information, including statutory corporate income tax rates (non-targeted and small business corporate income tax rates), is obtained from the OECD Tax Database, May 2017, and public sources for non-OECD countries. The model accounts for targeted, SME-specific corporate income tax rates in Australia, Brazil, Canada, Japan, Korea and the Netherlands.
- Expenditures on capital assets used for R&D are depreciated over their useful life, using a straight-line or declining balance depreciation method, as applicable. Estimates of the net present value of provisions relating to R&D capital expenditures draw on information about the benchmark tax treatment of capital expenditures, as collected through the OECD-NESTI questionnaire on R&D tax incentives, and the OECD Centre for Tax Policy and Administration questionnaire on the tax treatment of the creation, acquisition and use of knowledge capital. Estimates of tax subsidy rates are fairly robust to different choices of sources and methodologies because of the small weight of this component in eligible R&D expenditures.
- R&D tax allowances are deducted from taxable income, while R&D tax credits are applied against corporate income tax payable (as is the case for payroll withholding tax incentives and wage taxes). R&D tax benefits are taxable in Australia, Canada, Chile, the United Kingdom (Above-the-line tax credit for large enterprises) and the United States. Exemptions of payroll withholding tax and social security contributions are effectively taxable as they reduce the amount of expenditure deductible from taxable income.
- The model excludes incentives related to personal income, value added, property taxes, as well as taxes on wealth and capital and other forms of direct government support (grants and subsidies). Some countries remove in part or in full R&D expenditures funded through grants. These differences have not been modelled in the calculations.
- Unless otherwise specified, figures refer to “representative” firms in their class for which caps or ceilings that limit the amount of eligible expenditures or tax support are not applicable. Ceilings on the amount of eligible R&D expenditure or R&D tax relief exist in Australia, Austria (subcontracted R&D), Chile China (subcontracted R&D), Denmark, France (subcontracted R&D), Hungary, Iceland, Ireland (subcontracted R&D), Italy, Japan, Korea, Netherlands (WBSO), Norway, Portugal (incremental tax offset), Russian Federation, Slovak Republic (volume-based R&D tax allowance), Spain, Sweden, Turkey (R&D tax allowance: subcontracted R&D), the United Kingdom and the United States. A minimum R&D expenditure threshold determines eligibility for R&D tax relief in Australia, Chile, Hungary (R&D tax credit), Iceland and Italy. The rate of R&D tax relief varies below and above a certain level of qualified R&D expenditure (two level incentives) in Canada (CCPCs), France and the Netherlands (WBSO).
- The B-index for the profit scenario assumes that the “representative firm” generates a sufficiently large profit to achieve the incentive’s full potential benefit. An adjusted B-index is reported for a loss-making firm that is unable to claim tax benefits in the reporting period, using an adjusted effective tax rate that takes into account refundability and carry-forward provisions.
- Refunds are generally modelled as immediate and full payment of tax incentive claims unless excess claims are payable over time and require discounting.
- Carry-forwards are modelled as discounted options to claim the incentive in the future, assuming a constant annual probability of returning to profit of 50% and a nominal discount rate of 10%.
- For simplicity, loss-making firms are assumed to enjoy an infinite carry-forward of standard deductions of current R&D expenditures and depreciation expenses arising from the use of machinery, equipment and buildings in R&D, unless expenditures are refundable.
- The definitions of SMEs and large firms vary across countries and may also vary over time. In Belgium, France, the Netherlands, Portugal, Spain and the United States, special tax incentive provisions are available for young innovative firms, start-ups and innovative SMEs, as a subgroup of the SME population. The chart displays tax subsidy rates for large firms and SMEs. SME subgroup-specific B-indices are reported in the country notes below.
- Estimates are not included for Estonia and Israel, as insufficient detail was available in order to carry out calculations for representative firms in the relevant categories.
- Figures for Bulgaria, Croatia, Cyprus, Finland, Germany, Luxembourg and Switzerland, which apply no special treatment to R&D, reflect the value (or lack thereof) of available allowances for current and capital expenditures.

Country-specific notes

Country	Details
Australia	Figures refer to the R&D tax offset, which is only refundable for SMEs. Eligible R&D expenditure is capped at AUD 100 million since early 2015. This ceiling is not binding for SMEs. For large firms, a weighted tax credit rate has been estimated based on information on the proportion of large firms' expenditure above the AUD 100 million cap, averaging over 2011-12 and 2012-13 corporate tax return data. Indefinite carry-forward provisions are modelled.
Austria	Figures refer to the fully refundable research premium. For R&D performed from 2016 onwards, a tax credit rate of 12% applies (previously 10%). Ceiling on subcontracted R&D expenditure is assumed not to be binding.
Belgium	Figures refer to the R&D tax credit for capital expenditures (refundable) and the partial exemption of the payroll withholding tax (PWT). Modelled with carry forward and full refund after five years. It is assumed that the PWTE leads to a reduction of R&D wage costs of 20%, based on the 2011 estimate provided by the Belgian Science Policy Office (15-20% wage cost reduction at an exemption rate of 75%) and the increased exemption rate of 80% currently applied to payroll tax withholdings.
Brazil	Figures refer to the R&D tax allowance scheme for current expenditures. No refunds or carry forward are available.
Canada	Figures refer to the SR&ED tax credit, excluding capital expenditures which ceased to be eligible for tax support as of 2014. For SMEs, estimates describe the position of Canadian-controlled private corporations (CCPCs) which are eligible for an enhanced tax credit rate of 35% up to an expenditure ceiling of CAD 3 million. This ceiling is reduced as a function of taxable income and taxable capital and is fully phased out once the CCPC reaches a taxable income of CAD 0.8 million or a taxable capital of CAD50 million. For CCPCs, weighted tax credit rates have been calculated for the profit and loss-making case based on information on the share of qualified R&D spending below and above the ceiling (Scientific Research and Experimental Development (SR&ED) Tax Incentive Program administrative data, 2010-13). This takes into account different refundability conditions for firms above the ceiling depending on whether they are below the phase-out range (40% refund of eligible expenditure for CCPCs if prior year taxable income below CAD 500,000 and prior year capital below CAD 10 million) or inside the phase-out range (no refund for CCPCs if prior year taxable income between CAD 500,000-800,000 and prior year capital between CAD 10-50 million). Refundability and 20-year carry-forward provisions are modelled, but not three-year carry-back. Provincial R&D tax incentives have not been modelled.
Chile	Figures refer to the new R&D tax credit scheme for intramural and extramural R&D, which includes accelerated depreciation provisions for R&D capital. Eligible R&D expenditures are capped at 15,000 UTM (monthly tax unit) or an equivalent of approximately USD 1 million. For SMEs and large firms, weighted tax credit rates have been computed based on information on the share of eligible R&D of companies affected by the cap. Approximate weights have been constructed based on 2015 R&D survey data based on total, i.e. intramural and extramural R&D expenditure). An indefinite carry-forward provision is modelled.
China	Figures refer to the 50% enhanced R&D tax allowance for current and capital depreciation expenditures. For SMEs, a preferential tax allowance rate of 75% is modelled, effective January 2017. Ceiling on subcontracted R&D expenditure is assumed not to be binding. A five-year carry-forward provision is modelled.
Czech Republic	Figures refer to the 100% enhanced R&D tax allowance scheme for current and machinery and equipment related depreciation expenditures. As of 2015, The R&D tax allowance has additionally an incremental component (10% allowance on the amount of eligible R&D expenditure exceeding the previous year R&D spend). A three-year carry-forward provision is modelled.
Denmark	Figures refer to accelerated depreciation of capital in the profit and loss scenario. In the loss scenario, the 22% tax credit for deficit-related current R&D tax expenditures, introduced in 2012, is additionally accounted for. Eligible R&D expenditures are capped at DKK 25 million under this tax credit. It is assumed that this ceiling is not binding. An indefinite carry forward is modelled for non-current R&D expenditure.
Finland	No R&D tax incentives in 2017.
France	For SMEs, estimates describe the position of SMEs that do not qualify for young innovative enterprise (JEIs) or young university enterprise (JEU) status, and are based on a headline 30% Crédit d'impôt recherche (CIR) rate, assuming that the ceiling on subcontracted R&D expenditure is not binding. The B-index for JEIs and JEUs is 0.48 (instead of 0.57 for non-JEI/JEU SMEs), taking into account special provisions for social security payments and assuming that the ceiling on the amount of exempted social security contributions is not binding. For large firms, a weighted marginal CIR credit rate of 18.8% is calculated across firms to reflect differences in the CIR treatment according to the level of eligible R&D expenditure above EUR 100 million (credited at 5% instead of 30%) and the extent of collaboration with universities and public research organisations and share of declared expenditure attributable to the wages of young doctors (double credit for extramural expenditures and wage expenditures for researchers with a Ph.D. or equivalent degree during the first 24 months following recruitment). The weighted CIR tax credit rate for large firms is based on figures reported in "Le crédit d'impôt recherche en 2013" (French Science and Education Ministry, April 2016). Refundable tax incentives for SMEs and carry-forward provisions for large firms are modelled taking into account the ability to claim a refund after three years.
Germany	No R&D tax incentives in 2017.
Greece	Figures refer to the 30% volume-based R&D tax allowance for current and machinery expenditure. A five-year carry-forward provision is modelled.
Hungary	Figures refer to the 100% enhanced allowance for R&D expenditures, excluding collaboration agreements with higher education institutions, the Hungarian Academy of Sciences or research institutions established by them (300% R&D tax allowance). The figures further account for the reduction of the social security contribution (SSC) and vocational training contribution (VTC) tax from a rate of 23.5% to 0% for researchers and from a rate of 23.5% to 12.5% for Ph.D. students. For SMEs and large firms, weighted SSC tax credit rates have been calculated based on information on the shares of eligible wage expenditure attributable to researchers and Ph.D. students below and above the gross wage expenditure ceiling of HUF 500,000, using administrative data on reduced social security and vocational training contributions for researchers and Ph.D. students in 2016. Figures do not account for the innovation contribution related R&D tax allowance, local business tax related R&D tax incentive and the development tax incentive for acquisitions of intangible assets, machinery and equipment and buildings used for R&D purposes. This would require more detailed information for modelling. The SSC exemption is modelled as refundable. In the case of the R&D tax allowance, a five-year carry-forward

	provision is modelled.
Iceland	Figures refer to the 20% volume-based R&D tax credit for current R&D and machinery and building depreciation expenditures. Eligible intramural R&D expenditures are capped at ISK 300 million per project and firm (ISK 450 million in the case of purchased R&D or R&D collaboration). It is assumed that this ceiling is not binding. A five-year carry-forward provision is modelled.
Ireland	Figures refer to the R&D tax credit (current, machinery and buildings) and model the ability to claim a refund in three annual instalments. As of January 2015, the R&D tax credit is purely volume-based and all qualifying R&D expenditure is eligible for the 25% volume-based R&D tax credit. Ceiling on subcontracted R&D expenditure is assumed not to be binding. A one-year carry back provision is not modelled.
Italy	Figures refer to the incremental R&D tax credit (Legge di Stabilità 2015, Article 1, par. 35 and modifications by Budget Law for 2017) for current and machinery depreciation expenditures introduced on a temporary basis for 2015-2020. For SMEs and large firms, an R&D tax credit rate of 50% is applied to R&D expenditures in excess of the fixed average R&D spend over the tax years 2012-2014. Tax subsidy rate figures further do not consider the minimum R&D spending threshold of EUR 30,000 and the R&D tax relief ceiling of EUR 20 million per year. It is assumed that this ceiling is not binding. A refundable tax incentive is modelled for SMEs and large firms taking into account the ability of firms to offset earned credits against regional taxes (IRAP) and social security contributions.
Japan	Figures refer to the R&D tax credit for current and depreciation expenditures for machinery and buildings. For large firms, a volume-based credit rate of 14% is assumed (the rate varies between 6-10% and, as a temporary measure until FY 2018, between 6-14%, according to the percentage change in R&D expenditures relative to the past 3 year average). For small firms, a 17% volume-based tax credit rate is adopted (the SME rate amounts to 12% and varies between 12-17% as a temporary measure until FY 2018, according to the percentage change in R&D expenditures relative to the past 3 year average). R&D tax relief under the volume-based tax credit for intramural R&D is capped at 25% of the corporation's national corporate income tax liability or the national income tax liability before the credit is applied. It is assumed that this ceiling is not binding. The model does not account for the incremental R&D tax credit, repealed in the 2017 tax reform of Japan. The more complex "high R&D intensity" tax credit (temporary measure until FY2018) and the volume-based tax credit for cooperative R&D with universities and national R&D institutes (30%) or other non-public corporations (20%), have not been considered, due to lack of information on their relative importance and insufficient detail on applicable rates under the "high R&D intensity" tax credit. Refund and carry-over provisions are not available.
Korea	For SMEs, figures refer to the volume-based R&D tax credit schemes, provided at a rate of 25% for current and 6% for machinery expenditures. The positions of firms losing SME status (reduced volume-based rate of 15% for current R&D expenditure in the first three taxable years following loss of SME status and 10% in the subsequent two tax years) and the so called "high potential enterprises" (reduced volume-based rate of 8% for current R&D expenditure) are not modelled. For large companies, figures refer to the 30% (previously 40%) incremental tax credit for current R&D expenditure (applied to R&D expenditures in excess of the previous year R&D spend) and a 1% volume-based tax credit for machinery expenditure. The former is slightly more advantageous than the alternative volume-based tax credit, provided at a maximum rate of 3% (1% plus 50% of the R&D expense ratio, measured as R&D over revenue) in the benchmark scenarios considered here. The model further does not account for the Growth Industry and Basic Technology tax credit which is set to expire in 2018. A five-year carry-forward provision is modelled.
Latvia	Figures refer to the 200% enhanced R&D tax allowance on current R&D expenditures introduced in Latvia in 2014. An indefinite carry-forward provision is modelled.
Lithuania	Figures refer to the 200% enhanced R&D tax allowance on current R&D expenditures and an accelerated depreciation provision for R&D capital assets, available in Lithuania since 2008. An indefinite carry-forward provision is modelled.
Luxembourg	No R&D tax incentives in 2017.
Mexico	Figures refer to the 30% incremental R&D tax credit on current and capital R&D expenditures introduced in 2017. A ten-year carry-forward provision is modelled.
Netherlands	Figures refer to the WBSO payroll tax incentive on research labour costs and the R&D tax allowance (RDA) for non-labour related R&D expenditures which have been merged into a single scheme called the WBSO with effect of 2016. A 16% WBSO headline rate applies for companies with qualified R&D expenditure above EUR 350 000 (modelled for large companies) and 32% rate (modelled for SMEs) below this threshold. For start-up companies (firms which have employed personnel for a maximum period of four calendar years) an enhanced rate of 40% applies below the EUR 350 000 threshold. The deduction of the R&D withholding tax credit is limited to the payroll tax liability of the tax period. It is assumed that this ceiling is not binding.
New Zealand	Figures reflect the value of available tax allowances for current and capital expenditures. In the loss scenario, the 28% tax credit for deficit-related R&D tax expenditures, introduced in 2015, is additionally accounted for.
Norway	Figures refer to the SKATTEFUNN scheme for current and machinery R&D expenditures. Immediate refund available. For small firms (less than 50 employees) and large firms (50 or more employees), the weighted marginal tax credit rate has been calculated according to the share of eligible R&D expenditure below and above the 2017 R&D expenditure ceiling of NOK 25 million (above the threshold a marginal tax credit rate of 0% applies instead of 18% for large firms and 20% for medium-sized and small firms). Approximate weights are constructed based on 2015 R&D survey data (unweighted) on intramural R&D expenditure by firm size. It is assumed that the annual limit of NOK 50 million for R&D subcontracted from approved institutions and total qualifying R&D expenditure (sum of own and purchased R&D) is not binding.
Poland	Figures refer to the accelerated depreciation incentive for R&D capital (machinery and buildings) and the R&D tax allowance scheme introduced in Poland in 2016. As of 2017, a rate of 50% applies for R&D wage costs and 30% for other qualified R&D expenditures in the case of large companies. For SMEs, a rate a rate of 50% applies for all qualified R&D expenditure.
Portugal	Figures refer to the SIFIDE-II R&D tax credit for current and machinery expenditures. The limit on operating expenditures which qualify up to a level of 55% of R&D wage expenditure is modelled by excluding 50% of the share of other current costs. For SMEs and large firms, weighted incremental tax credit rates were computed based on 2015 SIFIDE-II administrative data on share of companies benefitting from the incremental tax incentive, and the share of those that are affected by the R&D expenditure ceiling of EUR 1.5 million. For start-up companies (firms which have not yet completed two exercises and are not benefitting from the incremental rate set), a B-index of 0.52 is calculated, taking into account an enhanced volume-based tax credit rate of 47.5%. An eight-year carry-forward provision is modelled.

Russian Federation	Figures refer to the 50% enhanced R&D tax allowance for current (including other current) and capital depreciation expenditures. Accelerated depreciation rates for capital assets used for R&D purposes are applied. Figures do not consider the exemption of social security contribution due to lack of information on applicable rates and the incidence of the R&D wage expenditure threshold. A 1-year (previously 10-year) carry-forward is modelled, effective 1 January 2017.
Slovak Republic	Figures refer to the volume-based and incremental (hybrid) R&D tax allowance scheme for current and capital expenditures introduced in January 2015. A four-year carry-forward provision is modelled.
Slovenia	Figures refer to the R&D tax allowance for current and machinery and equipment expenditures. A five-year carry-forward provision is modelled.
South Africa	Figures refer to tax allowances for current R&D expenditures. Indefinite carry forward is assumed.
Spain	Figures refer to the hybrid tax credit for current R&D expenditure and the volume-based, 8% tax credit for machinery expenditure. The model accounts for the standard and non-discounted R&D tax credit an alternative to which was introduced in January 2013 (fully payable R&D tax credit at a 20% discount, capped at EUR 3 million in the case of insufficient tax liability - this cap is raised to EUR 5m when the sum of R&D and technological innovation related expenses exceeds 10% of turnover). The hybrid R&D tax credit consist of a volume-based tax credit of 25% and incremental tax credit of 17% for R&D expenditure in excess of the average level of qualified R&D spend in the previous two years (a rate of 42% applies in total on incremental R&D expenditure). Due to lack of information on the relative importance of the 17% additional bonus for staff exclusively dedicated to R&D (42% enhanced volume-based credit rate) and the amount of R&D affected by the R&D tax relief ceiling, the model does not account for these two features of the R&D tax credit system in Spain. The amount of tax relief provided under various types of tax credits (including R&D) is capped at 25% of gross tax due if R&D tax credit related deductions amount to less than 10% of the tax due. Otherwise the cap is increased to 50% of the gross tax due. The estimates further do not account for the 40% exemption of employer social security contributions for qualified R&D staff which is only fully compatible with the R&D tax credit in the case of innovative SME. An 18-year carry-forward provision is modelled.
Sweden	Figures refer to the exemption of employer social security contributions introduced in January 2014 at a rate of 10% of the net salary of R&D staff subject to a deduction ceiling of SEK 2.76 million per year and minimum pension contribution requirement (social security contributions net the deduction amount at least to the old age pension contribution of 10.21% of the salary). It is assumed that minimum social security contributions are fulfilled and that the deduction ceiling is not binding.
Switzerland	No R&D tax incentives in 2017.
Turkey	Figures refer to the incremental R&D tax allowance for qualifying R&D centres, applicable at a rate of 50% on R&D expenditure exceeding the previous year R&D spend. The model further accounts for the 50% exemption of social security contributions made for FTE R&D staff by the Turkish Ministry of Finance. The SSC exemption is modelled as refundable. An indefinite carry-forward is modelled in the case of the R&D tax allowance.
United Kingdom	For large companies, estimates refer to the Research and Development Expenditure Credit (RDEC), introduced in April 2013 which offered at an enhanced tax credit rate of 11% is fully payable, net of tax. Estimates account for SMEs' ability to claim a 130% enhanced allowance rate, which is refundable. R&D tax relief under the R&D tax allowance scheme is capped at EUR 7.5 million per R&D project. It is assumed that this ceiling is not binding for SMEs. Since 2008 and for R&D relief purposes, an SME is defined as a company or organisation with fewer than 500 employees and either an annual turnover not exceeding EUR 100 million or a balance sheet not exceeding EUR 86 million.
United States	Figures refer to the regular research credit (RRC) and the alternative simplified credit (ASC), applying a 14% headline rate for the ASC. A weighted average of the respective B-indices is calculated, using 2013 information on their respective shares in total qualified R&D expenditures as weights. The calculation accounts for RRC claims subject to the excess base (20% marginal tax credit rate) and 50% current R&D expenditure limitation (10% marginal tax credit rate) and the share of qualified R&D that is neither eligible under the RRC nor ASC (0% marginal tax credit rate). It is possible that companies with specific features (size, profit and R&D dynamics) find it systematically more advantageous to opt for either of the schemes, in which cases the reported estimates will not be representative of the relevant type of firm. Estimates model 20-year carry-forward provisions, but not the one-year carry back. In the case of SMEs, the option to claim the credit against payroll taxes is also modelled. The estimates exclude special credits for energy research and basic research conducted in universities and certain non-profit research organisations.

Source: OECD, R&D Tax Incentive Indicators, <http://oe.cd/rdtax>, March 2018.