R&D TAX INCENTIVE SUPPORT: France

Public support for business R&D: the mix of direct funding and tax relief

The purpose of this country note is to compare France’s use of R&D tax incentives to their use in other OECD and major partner economies, drawing on the most recent data and information collected and published by the OECD. Tax incentives are a widely used policy instrument to encourage firms to invest in R&D. They comprise tax credits and allowances for a range of current R&D business expenditures, as well as other forms of tax relief such as schemes allowing for the accelerated depreciation of related capital expenditures. In 2015, 28 out of 34 OECD countries – and a number of major non-OECD economies such as Brazil, China and the Russian Federation – granted preferential tax treatment to business R&D expenditures.

Figure 1. Direct government funding of business R&D and tax incentives for R&D¹, 2013

As a percentage of GDP

Source: OECD analysis, based on OECD (2015a).

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Key findings

- In order to support business R&D, France relies on a combination of direct funding (e.g. grants and procurement contracts) and tax relief measures. Based on the latest available data, France is the third among OECD and key partner economies in terms of the total volume of (central) government support for business R&D, measured as a percentage of GDP (Figure 1).

- R&D tax relief in France accounts for approximately 70% of total public support for business R&D, the sixth largest share in the OECD area. This compares with an average share of 30% across surveyed countries for which data are available for 2013 (or closest year). 13 out of these 35 countries provide 50% or more of their funding of business R&D through tax incentives.

- A comparison of the magnitude of tax support in 2006 and 2013 (or closest years), as available for a group of 32 countries, shows an increase in the volume of tax support as percentage of GDP for 21 countries. In France, the cost of R&D tax relief rose from 0.09% to 0.26% of GDP between 2006 and 2013.
Trends in government support for business R&D

Between 2000 and 2013, the importance of R&D tax relief increased significantly in France both in absolute and relative terms (Figure 2). While the amount of tax support for business R&D increased in real terms almost nine-fold over this period, from approximately EUR 5.410 million to EUR 2320 million in 2013. As a percentage of GDP, direct support to business declined from its peak in 2008 of 0.15% to 0.11% in 2013.

Figure 2. Direct funding of business R&D and tax incentives² for R&D, France, 2000-13

Note: Estimates of the cost of R&D tax support in 2010, 2011, 2012 and 2013 are provisional

Chronology of main changes to R&D tax relief provisions over the 2000-13 period

The French R&D tax incentive regime dates back to the introduction of the Crédit d’Impôt Recherche (CIR) in 1983. Until 2003, firms were entitled to a credit worth 50% of eligible R&D in excess of the average spending over the two previous years, with a cap of EUR 6.1 million per firm. Variations in France’s volume of tax incentive support over time can be attributed to multiple factors, including changes in the design and generosity of tax relief as listed below:

- 2004: the French government introduces a 5% volume-based tax credit alongside the incremental scheme whose rate is reduced to 45%. The CIR tax relief cap is raised from EUR 6.1 million to EUR 8 million. A social security exemption is introduced for young innovative enterprises (JEIs) over a maximum period of eight years. JEIs also benefit from income tax exemptions. Companies can benefit from both tax credit and SSC exemption at once.
- 2006: the volume-based tax credit rate under the CIR rises from 5% to 10%, while the incremental tax credit rate is reduced to 40%. The CIR tax relief ceiling rises from EUR 8 million to EUR 10 million per firm and year. The wages of researchers with a Ph.D. or equivalent degree and unlimited employment contract (young doctors) count twice for R&D tax credit purposes during the first 12 months following their first recruitment.
- 2007: the annual CIR tax relief ceiling is raised from EUR 10 million to EUR 16 million.
- 2008: CIR becomes entirely volume-based. The credit rate is increased to 30% of the volume of R&D spending up to EUR 100 million (up from EUR 16 million). Beyond that level, firms receive a 5% tax credit, with no ceiling. The 30% rate is increased to 50% (first year) and 40% (second year) for firms claiming tax credit for the first time. Expenses incurred in work contracted to public-sector research bodies count double for research tax credit purposes. The period during which the wages of young doctors count twice for tax relief purposes is extended from 12 to 24 months. The JEI scheme is extended to young university enterprises (JEUs).
- 2009: as a temporary relief measure, SMEs and larger firms are both allowed an immediate refund of all unused credits related to the 2008 and residual claims from 2007, 2006 and 2005, instead of a 3 year waiting period.
- 2011: the enhanced tax credit rates for new claimants are reduced from 50% to 40% (first year) and from 40% to 35% (second year). Operating expenses are estimated on a flat-rate basis as 50% (previously 75%) of R&D labour costs and 75% (previously 0%) of depreciation cost of fixed assets.
- 2013: the enhanced credit rates for new claimants are abolished with effect from 1 January 2013.
Tax Incentive Support for Business R&D in OECD Countries – France

Design of R&D tax incentive support

In 2015, volume-based tax credits represent the most frequently-used form of R&D tax relief across OECD countries and partner economies. The summary overview of R&D tax incentive schemes (Figures 3.1 and 3.2) highlight the main differences and similarities of France’s tax relief measures vis-à-vis other OECD and major countries, based on a number of key design features.

**Figure 3.1. R&D tax incentive schemes: France compared to OECD economies, 2015**

<table>
<thead>
<tr>
<th>Features of expenditure-based R&amp;D tax incentive provisions</th>
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<tbody>
<tr>
<td><strong>FRANCE</strong></td>
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<tr>
<td>Instruments: Volume-based R&amp;D tax credit (Crédit d’Impôt Recherche: CIR)</td>
</tr>
<tr>
<td>Social security exemption for young innovative enterprises (JEI) and university enterprises (JEU)</td>
</tr>
<tr>
<td>CIR credit rate: 30% (up to EUR 100 million of eligible R&amp;D), 5% (above threshold)</td>
</tr>
<tr>
<td>SSC exemption (JEI/JEU): 100% for a period of up to 8 years</td>
</tr>
<tr>
<td>Corporation income tax (CIT) rate: 34.43% (CIT gradually reduced from 37.76% in 2000 to 36.43%, 35.43%, 34.95% and 34.43% in 2001/-02/-05/-06)</td>
</tr>
</tbody>
</table>

Types of tax relief schemes used in OECD and other major economies

Note: Instruments used by France highlighted in red. There are some countries with more than one scheme.


Expenditure-based R&D tax incentives principally apply to corporation taxes, payroll withholding tax or social security contributions (SSC) in the form of credits or enhanced allowances. In 2015, most OECD and partner economies providing tax incentives for R&D use either a tax credit (e.g. Australia, Canada, France, Ireland, Norway) or tax allowance (e.g. Brazil, China, Netherlands, United Kingdom) that is applicable on the volume of R&D expenditure undertaken. Other countries target tax credits (e.g. United States) to R&D expenditures over and above of a predefined baseline amount.

This type of incentive is commonly described as “incremental”, seeking to boost the additionality of the tax relief mechanism. Incremental schemes are more beneficial for firms with growing levels of R&D expenditures, but this is no guarantee that they result in R&D that would not have occurred in the absence of support. Incremental schemes can also be more complex to administer and encourage more volatile R&D spending in firms. Some countries offer a hybrid system of a volume and an incremental tax credit (Korea, Portugal and Spain) or allowance (Czech Republic, Slovak Republic and Turkey). Some R&D tax incentive schemes explicitly target some specific enterprises or forms of research.

In 2015, France provides tax incentive support for business R&D in form a volume-based R&D tax credit, known as Crédit d’Impôt Recherche (CIR) and exemption of social security payments for young innovative enterprises (JEI) and young university enterprises (JEU).
Main features

R&D tax incentives in France differ from the OECD median across a number of key design features (Figure 3.2):

- Compared to the median OECD\' incentive, more categories of expenditure are eligible for tax relief, including expenses related to self-developed patents and depreciation. R&D is defined as in the Frascati Manual, with the addition of textiles collections\, and some expenditure related to patents, standards and technological monitoring. Since 2013, the CIR is supplemented by an innovation tax credit, covering a range of possible innovation and design expenses other than R&D, up to EUR 400,000. This credit applies only to SMEs.

- Refund provisions are generally less common than carry-over provisions across surveyed economies. SMEs in France may benefit from an immediate refund of unused tax credits in the case of no or insufficient tax liability (e.g. loss). Large enterprises can carry-forward such credit up to three years, after which any non-deducted excess is returned.

- As in many other countries, an upper threshold applies to the amount of eligible R&D expenditure up to which firms benefit from an enhanced tax credit rate (30%), but a credit of 5% is still available beyond (16 companies were in this position in 2013). A tax relief ceiling further applies under the JEI/JEU scheme. JEI/JEUs are also exempt from social security contributions.

A number of OECD and partner economies provide income-based tax incentives for R&D and related innovation activities in addition to or in lieu of expenditure-based tax incentives. Since 2001, France has offered a patent box which foresees a reduced corporate income tax rate of 15% for royalties and capital gains from the licensing and disposal of qualifying IP (patents, extended patent certificates, patentable inventions and industrial fabrication processes).

**Figure 3.2. Design of R&D tax incentives: France\(^*\) compared to OECD\(^+\) economies, 2015**

<table>
<thead>
<tr>
<th>Eligible expenditures within scope of tax relief</th>
<th>Median(^#) OECD(^*) tax incentive</th>
<th>Crédit d'Impôt Recherche</th>
<th>JEI/JEU scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D labour</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Subcontracted, collaborative R&amp;D</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Materials</td>
<td>✓</td>
<td>✓</td>
<td></td>
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<tr>
<td>Overhead</td>
<td>✓</td>
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<tr>
<td>Machinery and equipment</td>
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<tr>
<td>Intangibles</td>
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<tr>
<td>Buildings and land</td>
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<td>Depreciation</td>
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<th>Number of schemes subject to relevant provisions</th>
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<tbody>
<tr>
<td>Refundability of unused credits (payable credit)</td>
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<tr>
<td>Carry-over provision</td>
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<tr>
<td>Threshold/Ceiling</td>
</tr>
<tr>
<td>Preferential treatment of SMEs/young firms</td>
</tr>
</tbody>
</table>

Note: Instruments used by France highlighted in red. Some countries have more than one separately identified incentive scheme.

Tax subsidy rates on business R&D expenditure

The design of R&D tax incentives such as the level of the tax credit/allowance rate and availability of refund and carry-over provisions are key factors determining the "expected" generosity of tax relief per unit of R&D investment. The B-index, a measure of the pre-tax income needed for a company to break even on a marginal, monetary unit of R&D outlay (OECD 2013), takes into account tax relief provisions to derive implied tax subsidy rates \( \text{t} \) (1 minus the B-index). This measure is calculated across OECD countries and partner economies offering tax relief for different firm size and profit scenarios (Figure 4). The indicator is calculated in order to reflect the implications of investing an additional monetary unit in R&D. In the presence of thresholds and upper ceilings for relief, this measure will differ from the average subsidy rate that is relevant for firms, especially multinationals, deciding whether to invest in R&D in a given country.

**Figure 4. Implied tax subsidy rates on R&D expenditures**, 2015

B-Index country distribution, by firm size and profit scenario

![Chart showing implied tax subsidy rates on R&D expenditures for different countries and firm sizes.](chart.png)

Note: This figure depicts highest and lowest values, 25th, 50th, 75th percentiles (box lines) and average (white dot).

Source: OECD, based on OECD (2015a).

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Key findings

There is a large variation in tax subsidy rates across all of the four scenarios considered. Large, profitable firms receive the highest (lowest) tax subsidy rate in Spain (New Zealand), whereas profitable SMEs benefit the most (least) from R&D tax incentives in France (New Zealand). In the case of insufficient profits, Spain and France still offer the largest tax subsidy rates for large firms and SMEs respectively.

Compared to the group of OECD economies, France offers a significant tax subsidy for both SMEs and large firms. The tax subsidy rate for SMEs is estimated at 0.43, both in the case of profit and loss-making, well-above the OECD median of 0.19 for profitable and of 0.13 for loss-making SMEs.

For large firms, the tax subsidy rate is estimated at 0.26 and 0.22 in the profit and loss-making scenario respectively. These rates compare to an OECD median tax subsidy rate of 0.13 for large profitable firms and of 0.10 for large firms with insufficient tax liability.

The analysis indicates that tax relief provisions are particularly intended to encourage R&D within SMEs and young firms, allowing the combined use of schemes, immediate refunds or unused credits and social security exemptions, while large firms do also enjoy a rather favourable regime compared to other countries. While the CIR credit rate that applies above the R&D expenditure threshold of EUR 100 million falls from 30 to 5%, it does still provide a positive marginal R&D investment inducement among large R&D performers. The average tax subsidy rate for companies with more than EUR 100 million of eligible R&D generates a sizeable incentive for decisions at the extensive margin (e.g. on the location of R&D activities).
What is the impact of government support for business R&D?

Government financial support for business R&D seeks to encourage firms to invest in R&D. Most often, support is provided with the intention of correcting or alleviating difficulties by firms to appropriate the returns to their investment and shortcomings in the market for the financing of risky projects, especially for small start-up firms without collateral. Tax incentives aim to achieve this goal while leaving the choice of how to conduct and pursue R&D programmes in the hands of the private sector, and are thus considered as market-based instruments. Compared with direct, discretionary subsidies, they are more easily compliant with competition and trade laws.

Countries do differ in the degree of scrutiny imposed on R&D projects for which tax incentives are claimed, and sometimes overall budgetary limits may apply, but in general they require lower administrative costs to monitor relative to direct support. A downside of this is the limited scope for identifying and supporting projects with the highest expected social returns that would have not taken place in the absence of relief. Another potential downside of “on-demand” tax incentives is the challenge of accurately forecasting the impact on public finances and managing budgets without creating uncertainty about the availability or magnitude of tax support among potential R&D tax relief recipients.

Despite the growing literature on the impact of different forms of support for business R&D, there is no simple, widely applicable answer to the question of what is the right volume of total support and the appropriate mix of tax incentive and direct support within countries. As previously shown, tax incentives are not equally beneficial to all types of potential R&D performers. The impact of tax incentives may depend on the nature and structure of a country’s innovation system. Indicators such as those presented in this note help provide an illustrative benchmark against which countries can compare themselves and bring about relevant dimensions that raise follow on questions and avenues for analysis.

Figure 5. Business R&D intensity and government support for business R&D, 2013

For example, across OECD countries and partner economies, there is a sizeable correlation between R&D intensity in the business sector and total government support for business R&D (Figure 5). However, Germany and Finland, for instance, have relatively high business R&D intensity compared to the degree of public support provided. Neither of these two countries provided tax incentives in 2015 (Finland briefly did so in 2013 and 2014). This comparative assessment of the incidence of public support may be incomplete because available statistics do not provide a comprehensive view of the role of the public sector in promoting business R&D through indirect mechanisms such as public procurement of new products, research institutes or loan guarantees. Compared to other countries, the BERD-GDP ratio of France appears to be rather modest relative to the level of support provided, which is dominated by R&D tax incentives.
Throughout the 2000-13 period, France’s level of business R&D intensity has been oscillating close to the OECD average. It stayed fairly constant up to 2008 and grew significantly afterwards (Figure 6), reaching a level of 2.5% of industry gross value added (GVA) in 2013. Part of this surge appears to follow the marked increase in R&D tax support that has taken place in France since 2007, more than offsetting the decline in direct funding over the same period. This appears to have helped sustain business R&D levels throughout the crisis.

**Figure 6. BERD and public support for business R&D, France, 2000-2013**

As a percentage of market-sector GVA

![Graph showing BERD and public support for business R&D, France, 2000-2013.](image)


This positive correlation over time may be indicative of the impact of France’s government support, and in particular R&D tax incentives, on business R&D. However, this evidence does not necessarily imply a causal relationship from support to R&D performance. Simple correlation analysis does not present a relevant counterfactual. There have been numerous evaluations of France’s tax incentive regime that coincide in supporting its effectiveness (OECD, 2014). However, there may be scope for better value for money and reduced deadweight. Potential concerns include the schemes’ financial sustainability and the extent to which additional R&D investment translate into improved business performance and outcomes among incumbents and start-ups.

In order to address questions such as how much R&D tax support goes to multinational firms or which support design features are associated to higher levels of R&D performance, the OECD Directorate for Science, Technology and Innovation has launched a new project that explores the variation in public support and business performance within and across countries, taking into account the wide heterogeneity in eligibility for support. The project is based on the distributed analysis of microdata through which the OECD collaborates with national experts with access to R&D and public support microdata undertaking a coordinated statistical analysis of the true incidence and impact of scheme design features and its interaction with direct forms of public R&D funding. This ensures preservation of data confidentiality while addressing questions that cannot be explored through analysis within a single country or publicly available data sources. Efforts such as this should be complemented by comprehensive evaluations, both quantitative and qualitative, at the level of individual countries (OECD, 2015b).

**References**


R&D tax relief information and indicators contained in this note are principally based on country responses to the 2015 OECD-NESTI data collection on tax incentive support for R&D expenditures (July 2015). For information on OECD work on R&D tax incentives, please contact us at RDTaxStatsContact@oecd.org or visit our website www.oecd.org/sti/rd-tax-stats.htm.


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1 Estimates do not cover sub-national and income-based R&D tax incentives and are limited to the business sector (excluding tax incentive support to individuals). Data refer to estimated initial revenue loss (foregone revenues) unless otherwise specified. Estimates refer to costs of incentives for business expenditures on R&D, both intramural and extramural unless otherwise specified. Cost estimates of R&D tax incentive support in the United Kingdom based upon national sources (HMRRC Research and Development Tax Credits Statistics, September 2015). Direct support figures refer only to intramural R&D expenditures, except for Brazil.

2 Estimates, on an accrual basis, refer to the crédit d’impôt recherche (CIR) and special provisions for social security contributions by young and innovative firms (JEIs) and young university enterprises (JEUs), but exclude the cost of accelerated depreciation incentives for capital R&D.

3 This summary overview is confined to R&D tax credits and allowances as well as payroll withholding and social security contribution related incentives. For additional information on the design and scope of R&D tax relief measures across OECD and selected economies and a detailed overview of eligible R&D expenditure, see http://www.oecd.org/sti/rd-tax-incentives-compendium.pdf and http://www.oecd.org/sti/rd-tax-incentives-expenditures.pdf

4 For information on non-targeted and targeted corporate income tax rates at central, sub-central government level and combined, see http://www.oecd.org/tax/tax-policy/tax-database.htm

5 According to national sources, textile collections account for approximately 1% of the total tax relief provided through the Crédit d’Impôt Recherche in 2013.

6 For more information on the French patent box, see http://www.entreprises.gouv.fr/secteurs-professionnels/comment-valoriser-brevet-grace-a-france-brevets

The definition of R&D used for the purposes of the research tax credit (crédit d’impôt recherche, CIR) set out in Article 244 quater B of the French Tax Code (Code Général des Impôts, CGI) is consistent with the definition given in the Frascati Manual (http://ocd.frascati). 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 quality 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 JE1 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.

The median OECD tax incentive reflects the count based, median characteristics of R&D tax incentive schemes available in OECD and partner economies (Brazil, China, Russian Federation and South Africa) as of July 2015.

9 The tax subsidy rate, calculated as 1 minus the B-index, 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. For more details, please see www.oecd.org/sti/rd-tax-stats.htm.

10 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. For general and country-specific notes, see http://dx.doi.org/10.1787/888933274335