



A Study on R&D Tax Incentives

Annex: Good practice cases

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1 R&D Tax Relief (UK)

1.1 Background of the measure

For a long period investment in R&D as a proportion of GDP (GERD) in the United Kingdom was below that of other advanced countries. The government was committed to improve country's international position and productivity, which led to the introduction of the R&D Tax Relief.

Prior to the introduction of R&D tax relief, only capital investment for "scientific research" was treated favorably by the tax system. The Scientific Research Allowance (SRA) allowed a hundred percent depreciation in the year of investment. The scope of the SRA was limited, as the definition of "scientific research" was narrow and capital costs represent only part of an R&D spending (Bond and Guceri 2012).

The tax relief for R&D was first discussed in the starting year of the new Labour government by the Chancellor Gordon Brown and presented in the Pre-Budget Report 1997. An R&D tax allowance for SMEs was introduced in the Budget Statement of March 2000 (Bond and Guceri 2012). It was extended to large company scheme in 2002.

The primary aim of R&D tax reliefs is to increase the level of R&D spending in United Kingdom that should translate in more innovation and overall general welfare.

The policy has been reviewed several times with consultations taking place in 2010-2011 and 2012. Those consultations led to policy amendments and an introduction of a currently optional above-the-line R&D tax credit for large firms (ATL).

In the most recent Budget Statements the government has expressed its commitment to continue to support R&D investments through generous tax benefits, and other means, in order to further support innovative activity in United Kingdom.

1.2 Description of good practice case¹

United Kingdom's R&D tax relief is a tax allowance that reduces taxable corporate income by an amount that is proportional to R&D expenditure. For tax purposes, the enhanced allowance either reduces the firm's income, or increases its losses. The R&D relief is separated into scheme for SMEs and large companies, offering more generous rates for the former group.

For all R&D schemes the qualifying R&D expenditure is defined as "R&D projects that seek to achieve an advance in overall knowledge or capability in a field of science or technology through the resolution of scientific or technological uncertainty - and not simply an advance in its own state of knowledge or capability" (HMRC, n.d). In other words, projects that intend to create products that are "new to the world". The definition of "science" does not include arts, humanities and social sciences.

If a company or a specific project is in line with the required conditions, then it can claim the R&D relief on current R&D expenditure (running costs), but not on capital costs. For capital R&D expenditure an accelerated depreciation is available to all companies at a 100 percent rate. The allowance must be claimed in the accounting period in which the R&D costs were incurred. No limit of maximal costs that can be claimed is set.

Small and Medium-Sized Enterprise (SME) Scheme

¹Description rests on: HM Revenue and Customs (HMRC), 'Research and Development (R&D) Relief for Corporation Tax', n.d. Accessed on 26 August 2014. Available at: <http://www.hmrc.gov.uk/ct/forms-rates/claims/randd.htm>

The deduction rate for SME scheme was increased several times over the 2008-2012 period. Currently, it offers qualifying SMEs a 125 percent deduction; for every EUR 100 spent on R&D, a firm can deduct another EUR 125 from its pre-tax corporate income. The scheme includes an indefinite carry forward facility and the maximum amount of the government support that any one R&D project can receive is EUR 7.5 million.

As from August 2008, SME is defined as a "company or organization with fewer than 500 employees and either having an annual turnover that does not exceed EUR 100 million or a balance sheet that does not exceed EUR 86 million" (HMRC, n.d.). Companies outside the definition can apply to the large company scheme.

SMEs that are part of a group do not qualify for the SME scheme, if the company as a whole does not qualify. Also, if the SME is subcontracted for R&D project by other company, it cannot claim under the SMEs scheme. However, SMEs can qualify the expenditure that they themselves have subcontracted to others.

Applications are reviewed on a project basis, so it is possible that a qualifying SME claim one project under the SMEs measure and another under the Large Company Scheme (e.g., for subcontracted projects). When a company that would normally qualify as a SME has received a grant or subsidy for an R&D project, recognized by the European Commission as "State Aid", the company cannot further claim anything under the SME Scheme. Firm may still apply to the Large Company Scheme instead. The following conditions must hold: (a) the expenditure would qualify for Large company scheme if the company was "large"; (b) expenditure does not qualify for SMEs scheme only because it was subsidized or because the total amount received through tax benefits exceeds the EUR 7.5 million limit. For any other type of grant or subsidy, firms can still qualify for the SME scheme but the claimed expenditure would be reduced by the amount received through such aid.

A payable credit is available to loss making companies. The rate of the cash refund was recently increased. With 2014 budget the government announced that from April 2014 onwards the payable credit will be raised from 11 percent to 14.5 percent.

The Large company scheme

Currently two schemes coexist for large companies investing in R&D: the optional Above the line (ATL) scheme and R&D relief for large companies.

R&D relief for large companies offers a less a generous benefit than SME scheme and does not have the option to receive a payable credit in case a firm has losses. The definition of R&D is common to both tax incentives, while the definition of qualifying expenditure differs on certain rules. Those are²:

- "The amount of the enhanced allowance will not be reduced if the large company benefits from grants or subsidies
- A firm can claim only that expenditure carried by the firm itself, unless it subcontracts to a "qualifying body (a charity, an institution of higher education such as a university, a scientific research organisation or a health service body), individual or a partnership of which each member is an individual"

² HM Revenue and Customs (HMRC), 'Research and Development (R&D) Relief for Corporation Tax', n.d. Available at: <http://www.hmrc.gov.uk/ct/forms-rates/claims/randd.htm>

- Large companies may claim expenditure under the Large Company scheme if they themselves have been sub-contracted”

Expenditure incurred after April 2008 receive a 30 percent deduction; for each GBP 100 of qualifying R&D costs, the company can reduce the income on which corporate tax is paid by an additional GBP 30. A carry over facility is available.

The newly implemented ATL, which will become mandatory for all large companies after April 2016, offers a 10 percent taxable credit on the amount of firm’s R&D activity, set against corporation tax liabilities.

For firms without corporation tax liabilities, the credit is fully paid out net of tax with a cap equal to the total sum of *Pay-as-you-earn (PAYE)/National Insurance Contributions (NIC)*³ liabilities. As with the R&D relief for SME and large companies, no minimum amount of investment in R&D is required. Similarly, firms can carry forward losses indefinitely.

For all R&D tax incentives the application procedure is settled online together with filing of tax returns. No specific requirement for record keeping exists, but the general corporate tax obligation to preserve necessary documentation to support the information provided in the tax reforms applies.

1.3 Impact

Over the past decade, the total amount invested in R&D has risen from GBP 12.2 billion (around EUR 15.3 billion) in 2001 to GBP 17.1 billion (around EUR 21.7 billion) in 2012. However, BERD as a percentage from GDP has been roughly stable. In 2001 it was 1.2 percent, while in 2012 it was 1.1 percent (ONS, 2012). This does not suggest that the impact of the R&D tax relief has been large for the overall economy. Bond and Guceri (2012) explain this by sectoral composition changes. They show that while there was a substantial increase in the ratio of BERD to value added in the manufacturing sector, the share of the manufacturing sector in the United Kingdom economy has been falling. This might have obscured the impact of the tax incentives.

The most recent statistical assessment of the R&D tax relieves shows that over 100,000 claims have been made through the R&D tax credit schemes since their launch in 2000/01. This comes from more than 28,500 companies claiming relief through the SME scheme and over 7,000 through the large company scheme that was launched two years later (ONS, 2014). The tax relief provided by the schemes exceeded GBP 9.5 billion (around EUR 12 billion) in this period.

The popularity of the schemes has been increasing over the years with a strong rise during the Great Recession when both R&D relief for SMEs and Large company scheme became more generous. In comparison with the previous year, the total number of claims in 2012/13 increased by 26 percent. This raise was mainly driven by the increased popularity of the SME scheme, where claims rose by 30 percent.

The total amount of R&D support claimed in 2012/13 increased to GBP 1.4 billion (around EUR 1.8 billion), which was GBP 150 million (EUR 190 million) more than in the previous period. The increase was entirely driven by the SME scheme, where claimed expenditure rose by GBP 170 million (EUR 215 million), while it decreased slightly for Large company scheme from GBP 790 million (EUR 1 billion) to GBP 770 million (EUR 975 million) (ONS, 2014). Qualified R&D expenditure rose by ten percent,

³UK government system to gather National Insurance contributions (NICs) and Income tax from employees. It is based on the employees’ earning and collected around the financial year

to GBP 13.2 billion in 2012/13. Nevertheless, the Large company scheme still accounted for 80 percent of total R&D expenditure claimed.

Almost half of SMEs sort of "combined" claims, using R&D tax relief for SMEs first to reduce the tax payable to zero and then receive the rest as a cash refund. In other cases, company with no profits chose to receive part of the benefit through a cash refund and carry forward the remaining to following years.

SMEs may apply for Large company scheme if they provide sub-contracted services to large company. The amount of such cases increased substantially across the period from 2002/03 to 2010/11; from 60 to 530, respectively, and reaching 580 in 2012/13 (ONS, 2014).

An evaluation carried by HM Revenue and Customs (HMRC) (2010) for the period between 2000 and 2007 and another study that analysed R&D effects in Northern Ireland between 1998 and 2003 by Harris et al. (2009) concluded that the R&D tax relieves had a positive impact on R&D expenditure. However, Harris et al. (2009) found that the productivity of firms in Northern Ireland could only be increased with very generous benefits. As noted by Harris et al. (2009), these effects can be lower in practise due to relatively inelastic labour supply curve in the region.

A survey carried by HM Revenue and Customs (HMRC) among companies undertaking R&D activities showed that companies believed R&D tax benefits induced them to spend more on R&D. However, in large companies R&D activities appeared not to be sensitive to R&D tax incentives, as they were part of a long term strategic plan (HMRC, 2000). Nevertheless, in the presence of the tax allowance, firms were more inclined to invest in more risky projects.

1.4 Reasons for highlighting this programme

United Kingdom's R&D tax relief schemes are well administered, with firms being able to easily access all necessary information about the instrument's design, changes made and prospected, as well as practical information about application procedure and possible enquiries that may be made. It is further enhanced by government offering several "help points", where firms can turn for advice on their R&D claims.

The schemes are reviewed through public consultations, and necessary amendments are taken place after the views have been received. This encourages schemes to be up-to-date and to offer better value for tax money.

The novelty requirement for R&D is defined as 'new to the world'; only those activities that promote the overall knowledge or capability are supported. Such approach is consistent with the underlying argument of why government intervention in innovation market could be desirable.

1.5 Conditions of transferability

The good administrative practice of R&D tax incentives in the United Kingdom could be adapted in other countries by enhancing the information available on the internet, including both practical information about the application procedure, as well as background of the measure and information on the policy changes.

Other countries can consider the experience of UK in introducing novelty requirement "new to the world", which is viewed as best practice since it stimulates advancement to overall knowledge, not just firm's own state of capabilities.

The feature that companies can claim the R&D relief on current R&D expenditure, but not on capital costs is not recommendable and might not fit well with tax systems in other countries.

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2 Skattekreditordningen (Denmark)

2.1 Background of the measure

The R&D tax credit scheme is part of the government's growth plan for Denmark, which was proposed in April 2013. Skattekreditordningen is intended to be a temporary measure during the economic recession.

Its goal is to promote and strengthen the growth of the private sector. Along with the introduction of Skattekreditordningen and other measures, government has planned to gradually decrease the corporate tax rate from 25 percent to 22 percent in 2016, a rate below the EU average.

Skattekreditordningen is targeted to loss making R&D firms, as only those firms qualify for the tax credit. Indirectly such approach shifts the support to young, small enterprises. The background idea was that the *negative tax* option will strengthen the liquidity of especially those small firms that are in the start-up phase, when R&D activities have not yet resulted in income. Furthermore, those companies are facing additional difficulties in obtaining finance in times of financial and economic downturn.

2.2 Description of good practice case

The Danish R&D tax credit scheme, called "Skattekreditordningen", was implemented in January 2012. To be eligible, entity must be loss-making and the benefit applies to the part of the losses that can be attributed to R&D activities. If the company is part of a group, the consolidated taxable income must also be negative.

The R&D tax credit is volume-based and applies to all R&D expenditure that is targeted at developing significantly improved or new materials, products, mechanisms, systems or services. The cash refund can be received only on the losses made in the current year.

Both companies and self-employed can benefit from the scheme, the ratio is common across all regions, firm sizes and ages. The tax credit does not apply to activities linked with oil and gas extraction: expenditure related to searching or obtaining the raw materials, including expenditure on machines that are used for those purposes, does not qualify.

Change of rates and the level of maximum deduction has been planned beforehand. During the years 2012, 2013 and 2014 a firm could apply for a payment of 25 percent of the deficit that had occurred from R&D expenses. In 2015 the rate will be 23.5 percent and in 2016- 22 percent. The maximum R&D expenses for a firm in 2012 and 2013 were DKK 5 million and the maximum deduction was DKK 1.25 million a year. In 2014, the ceiling has been raised to DKK 25 million (around EUR 3.36 million).

Hence, the maximum annual payment that firms could receive in 2012 and 2013 was DKK 1.25 million; in 2014 it was DKK 6.25 million; in 2015 DKK 5.875 million and in 2016-DKK 5.5 million (around EUR 740,000). For companies that are part of a group, the maximum ceiling applies to the consolidated eligible expenditure of all group members.

In order to obtain the tax benefit, firms do not need any prior approval. The application with the request for payment is given to the tax authorities together with the tax return for the same year. The application can be settled through the internet.

Tax authorities are paying the tax credits every year in November (the next year after the application has been received). If the period during which a firm has been active is shorter than twelve months, the amount that will be paid is reduced proportionally.

An assessment of the impact of Skattekreditordningen is intended once the data from the beneficiary firms will be collected. Assessment of the tax credit is part of the government's commitment to regularly assess the effectiveness of tax policies.

Already before the Skattekreditordningen was introduced, firms have been able to deduct their R&D capital expenditure in the same year as they have occurred. This right came into force in 1973 and is still in use. Accelerated capital amortization is provided as follows:

- The purchase price of machinery, equipment and ships acquired for R&D purposes may be deducted in full in the year of acquisition.

A full deduction in the year of acquisition generally is available for patents and know-how, irrespective of the economic life or the amount of purchase price.

2.3 Impact

In the first year of the tax credit, around 600 applications were received and DKK 300 million (around EUR 40.3 million) were paid out as tax credit, which is close to the planned government approximations.⁴

According to the benchmarking indicators provided in the report, Danish R&D tax credit schemes rank high in organisation. This, in combination with the relatively simple design of the instrument, enhances the accessibility of the instrument.

2.4 Reasons for highlighting this programme

Skattekreditordningen is a unique R&D tax credit scheme in a sense that it targets the support only to those R&D firms that have liquidity problems. Such approach is especially relevant for start-up companies that in their first years of operations lack the financial resources that are needed to grow and develop.

The policy instruments are also well implemented. In order to apply for the R&D tax credit, firms face relatively low compliance costs: the application procedure can be settled online, together with the yearly tax returns. The negative side is the long period of the actual reimbursement of the tax credit that can take up to two years. Before the introduction of the policy instrument, several stakeholders were heard. This can contribute to an effective organisation of the scheme.

Danish tax policy instruments are assessed regularly. The quality of the evaluations is enhanced by the wide availability of micro-level data, provided by Statistics Denmark online. Data is provided for different branches, for basic research, applied research and development work. The data is internationally comparable as the collection of data on R&D expenditure and innovation in Denmark is carried according to the statistical norms of the EU and OECD.

2.5 Conditions of transferability

The design of the Danish R&D tax credit scheme could be applied in other countries that wish to support firms that face larger liquidity problems. A less desirable feature of the instrument is that the current design inevitably also supports mature firms that are not successful. Furthermore, the scheme might provide incentives for moral hazard, if not correctly implemented (firms may have an incentives to manage their

⁴Based on information provided by Danish representative Rasmus Igum in the Second Working group meeting on "Exchange of good practices on R&D tax incentives" (30.09.2014)

books in such a way to be loss-making). A focus on young firms can improve the effectiveness of the tax incentives.

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3 SkatteFUNN (Norway)

3.1 Background of the measure

Historically Norway has not been characterized as a high-technology country with its economy mainly based on extraction of natural resources and raw materials, as well as industrial processing of semi-finished goods and bulk products (European Commission, 2013). A proposal to introduce a special tax regime for R&D activities to motivate more R&D and innovation in Norway was put by the Hervik Commission in a green paper for the Ministry of Trade and Industry in 2000 (Cappelen et al., 2010). Norwegian Parliament expressed a commitment to make investments in R&D a national priority. Introducing R&D tax credits was one of the actions taken (Hægeland, and Møen, 2007).

The target was to reach at least the average R&D to GDP ratio of OECD countries by year 2005. It was argued that, if compared with the direct measures, R&D tax credits would result in less administrative cost and be less sensitive to information asymmetries between the government and the private sector. R&D tax credits would also be more stable than direct subsidies.

The stability of the scheme was ensured by embedding the details of the instrument's design in the legislation and agreeing not to discuss the total tax subsidy in the yearly budgetary debates. The proposal of the R&D tax scheme was presented in the National Budget 2002 and introduced in the fiscal year 2002 (Hægeland, T. and Møen, J., 2007).

SkatteFUNN was intended to be a major policy tool for small and medium-sized companies. From January 2002 only those firms could benefit from the tax reduction. However, as of January 2003, also large firms can qualify.

3.2 Description of good practice case

Currently under SkatteFUNN R&D tax credit, small and medium enterprises may deduct 20 percent of expenses related to an approved R&D project, which is set against their corporate tax liability. A SME enterprise is defined as having: (a) fewer than 250 employees; (b) an annual turnover not exceeding EUR 50 million or an annual balance sheet smaller than EUR 43 million⁵. Firms that do not qualify under this definition (large enterprises) may deduct 18 percent.

To qualify for the SkatteFUNN, the project must be targeted and limited, project goals must be clearly stated and measurable. Firms should include an activity plan, demonstrating the project activities and timing. The project must aim at generating new knowledge or skills. It also must involve the development of new or improved products, services or production processes benefiting the business⁶. A firm can undertake the R&D project alone, together with other firms or with approved R&D institutions (universities or institutes). SkatteFUNN is also neutral towards any sector or region.

A firm does not need to be in a profit-making position to qualify, but it has to be registered as having tax liability in Norway. If the amount of tax benefit exceeds the

⁵LOVDATA, Skattefradrag for kostnader til forskning og utvikling (FoU-fradrag). Accessed on: September, 2014. Available at: lovdata.no/dokument/SF/forskrift/1999-11-19-1158/KAPITTEL_16-5

⁶ Forskningsradet, Søknadsprosessen. Accessed on: August 2014. Available at: www.forskningsradet.no/prognettskattefunn/Soknadsprosessen/1247145113245

tax payable by the firm, the difference is cash-backed to the firm. In case the company is not in a tax position at all, the whole amount is reimbursed. The expenditure cannot be carried over; costs should be deducted in the same income year as the project was approved.

In order to qualify for the tax benefit, firm is not required to have any minimum R&D expenditure. The amount of benefit that a firm can receive is restricted by a maximum ceiling, applicable to all sizes of firms. In any one year for all own R&D projects, a firm can claim the benefit for expenditure that does not exceed NOK 8 million, which results in NOK 1.6 million for SMEs (20 percent from NOK 8 million; around EUR 200,000) and NOK 1.44 million for large companies (around EUR 180,000). In case a project is a result of cooperation with an approved R&D institution, the maximum R&D expenditure that can be claimed is increased to NOK 22 million, which translates in NOK 4.4 million maximum benefit for SMEs (around EUR 540,000) and NOK 3.96 million for large companies (around EUR 490,000).

The benefit is further limited to salaries of R&D personnel; hourly wages cannot exceed NOK 600/per hour (around EUR 74/hour) and the maximum number of labour hours are 1850h. The purpose of such restriction was to avoid the spill-over of the subsidy to wages.

The SkatteFUNN R&D tax deduction system lies administratively under the Ministry of Trade. The decision of whether to approve a tax claim is made in cooperation between The Research Council of Norway, Innovation Norway and The Directorate of Taxes. In order to decrease the uncertainty for firms, Innovasjon Norge (*Innovation Norway*) makes a pre- assessment of whether the project qualifies for support or not. Forskningsrådet (The Research Council of Norway) approves or disapproves the application. Skatteetaten (Skattedirektoratet, Directorate of taxes) finally makes the decision about the amount of the tax benefit.

Additionally, it is required that the costs that are included in the calculations for the R&D tax credit application are verified by an auditor. The Tax Authorities control the reported costs and calculates the size of the tax deduction. In case of positive response, the benefit is paid out the next year after the actual investment in R&D took place.

Application procedure is based on self-declarations and can be carried online. Advice and guidance throughout the application can be received from Innovation Norway and SkatteFUNN department. The online application form provides explanations for all covered questions. An example of a filled application is also available online.

3.3 Impact

In total during 2002-2013 period SkatteFUNN received 32,258 projects, of which 24,619 were approved (76 percent of applications). In total this represented 10,250 companies⁷ (Norges forskningsråd ,2014).

The total government expenditure of SkatteFUNN between 2002-2013 was around NOK 13.1 billion (EUR 1.61 billion). Over the years, the budget of the SkatteFUNN scheme has been larger than the actual cost. For instance, while in 2012 the budgeted spending of SkatteFUNN was NOK 2 billion, the actual government costs in 2012 were less than NOK 1.4 billion (EUR 170,000) (Norges forskningsråd ,2014).

The number of new projects and total applications had the highest peak in 2003, when also large firms were allowed to qualify for the tax benefit. Afterwards, until 2007, both the number of total applications and new projects declined and experienced a period of stable movement up until 2011. In 2012 and 2013 the number of new

⁷ Note that firms can claim more than one project

projects and applications increased again, representing 2037 new projects and 2530 applications (Norges forskningsråd, 2014).

SkatteFUNN is especially used by small and medium enterprises. In 2012, 88 percent of the projects came from firms with fewer than 100 workers. An important aspect of the scheme has turned out to be the possibility to receive a cash-refund in case the tax benefit exceeds the amount of tax liability; around 75 percent of the benefit was paid in such a way (Hægeland and Møen, 2007a).

Hægeland and Møen (2007a) from Statistics Norway analyzed the impact of the SkatteFUNN during the period 2002-2006. They used the discontinuities in the design (the ceilings of benefit) to define a control and treatment group in order to perform a difference-in-differences analysis. They found wide scope of results, generally implying that the scheme has a positive impact on firm R&D expenditure. On average, they found that one krone spent as foregone tax revenue, induced more than two krone of additional R&D. Nonetheless, they note that the effect seems to be driven by firms that did very little R&D before the implementation of the tax scheme. The additional effect on R&D expenditure tended to be larger in small, low-tech and relatively low-skilled firms.

In a complimentary study Hægeland and Møen (2007b) analyzed the relationship between SkatteFUNN and other policy instruments. Though results are sensitive to different model assumptions and data limitations, they found that R&D tax credits in Norway resulted in larger additionality effect on R&D spending than direct subsidies. They noted that "according to their preferred estimate, each krone on tax credits spent induced private R&D to increase by 2.68 krone. The additionality effect for subsidies awarded by Research Council and Innovation Norway was 2.07 and 1.53, respectively. The additionality of grants by ministries and other public agencies was 0.64"(Hægeland and Møen, 2007).

They also demonstrated that projects financed through direct subsidies have "essentially zero private returns", which they explain as the result of well-functioning grant allocation process.

For SkatteFUNN they show that the estimates on private returns are sensitive to different specifications and differ extensively by projects. However, on average, they found that projects that were financed by R&D tax credits had slightly lower returns than projects financed by own funds- 16 percent and 19 percent, respectively.

Study by Cappelen et al. (2012) looked at whether the SkatteFUNN scheme has motivated firms to have more innovation outputs. They found that the tax credit induced firms to implement new production processes and products that were new to the firm. However, it did not result in more radical innovation in the form of new patents or products that would be new to the market. Hence, the scheme seems to support more incremental but not radical innovation.

Fjærli (2007) analyzed the administrative aspects of the SkatteFUNN. Fjærli looked at around 300 project claims from one county between 2003 and 2004 and found that claims were frequently poorly filled in and that "only around half of the claims were of sufficient quality"(Fjærli, 2007, in Cappelen, et al.,2010). Majority of auditors noted that it is rather complicated to actually verify, whether the values recorded by firms are true (Fjærli, 2007, in Cappelen, et al., 2010). The analysis revealed that firms tend to claim more expenditure than what actually incurred; "time claimed per employee in the application was 50 to 100 per cent higher than expected based on the firms' characteristics" (Fjærli, 2007, in Cappelen, et al.,2010). The 'increase' in the expenditure stemmed from both inflated man-hours and wages paid, which he shows by comparing the values with similar firms that did not use the tax incentive. However, such tendency appeared to be driven by small part of the firms with highest

reported values, which were usually small firms with less than 10 employees (Fjærli, 2007, in Cappelen, et al.,2010).

3.4 Reasons for highlighting this programme

While Norway's R&D tax credit SkatteFUNN offers a preferential rate to SMEs, otherwise the tax credit is generic. In benchmarking, SkatteFUNN ranks especially high in terms of organization. This stems from that the application procedure is relatively simple; firms can apply online; the policy was motivated through a consultation and it has been evaluated various times. Due to those evaluations, a special database with time-series data on firm level was constructed, which promotes replication of results and further studies. Such practice is advisable.

3.5 Conditions of transferability

The policy has not had many policy changes, the scheme has been evaluated various times and the application procedure itself is simple and provides low compliance costs to firms. Those aspects are the ones that could be transferred to other countries, in which such practice does not take place yet.

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4 Jeune Entreprise Innovante (JEI)

4.1 Background of the measure

France historically has had a strong tradition in scientific and technological advancement, and it still continues to play an important international role in this field. Investment in research and development is set as one of the country's priorities, in line with the policy targets set in EU 2020 strategy. Gross government expenditure in R&D as a percentage of GDP is above the EU average, reaching almost 2.3 percent in 2012, and being relatively stable over the period 2000-2012.⁸

First R&D tax credit in France- *Crédit Impôt Recherche* (CIR) - was introduced already in 1983, and is still practiced. Even though, the various reviews and evaluations of CIR tended to agree that CIR is effective in spurring more R&D expenditure, the tax credit did not especially address young, R&D intensive firms who face additional challenges in obtaining finance.

Following discussions in the government and reflecting the targets set in the Lisbon strategy, a new scheme that target young firms with relatively large R&D budgets, was established in Finance Act 2004. The new scheme, *Jeune Entreprise Innovante* (JEI), offers a preferential tax treatment to young SMEs who carry R&D activities. Introduction of such measure was based on the view that those companies, being essential for healthy economic processes and innovation growth, face the largest obstacles to obtain additional funding that is crucial for their growth (Hallépée and Garcia, 2012).

4.2 Description of good practice case

JEI scheme is targeted towards young innovative firms that are defined as independent SMEs, which are younger than eight years and whose R&D expenditure covers at least 15 per cent of the total expenses. Firms that have been created as a result of mergers or restructuration of companies that would not qualify as JEI, or that are formed as an extension of existing business, are excluded. SMEs are defined in accordance with EC recommendations. Those are firms having less than 250 employees, with either an annual turnover below EUR 50 million or the total balance sheet not exceeding EUR 43 million.

The scheme offers a wide range of different tax breaks, including reduced corporate and local taxes, as well as social security contributions. Since its introduction, the offered rates of discount have been amended various times. Up till the end of 2010, firms were exempt of social contributions for the first eight years of JEI participation, and from corporate tax liability for the first three years. In the fourth and fifth year it offered a 50 percent reduction in the corporate tax rate. In 2011, the social contribution benefits were decreased, offering tax exemption in the first four years, and then gradually decreasing to 10 percent discount in the final eight year.

A maximum amount that a firm can receive was introduced in 2011. This implies that the benefit cannot exceed EUR 200,000 over three fiscal years. Per salary the maximum amount that can be received is 4.5 times the minimum salary; per

⁸ Eurostat, Eurostat, *Europe 2020 indicators:Headline indicators*. Accessed at: August, 2014 Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators

establishment- three times the ceilings of social security contributions, being EUR 106,056 in 2011.⁹

From January 2012, firms are free of corporate tax in the first year of participation in the scheme. In the second year, firms receive a 50 percent reduction in the corporate tax. Starting from the third year, no discount is given to the corporate tax payment. The rate of benefit available from social contributions was increased in 2012, offering firms to be exempt from the contributions in the first four years, and then gradually decreasing to 50 percent discount in the final eight year. The ceiling of the benefit per establishment was also increased to being five times the amount of annual social security contributions, which is EUR 187,740 in 2014.¹⁰

Starting from January 2014, the rate of benefit for social security contributions was further increased. Qualifying firms are exempt from social security contributions for the whole eight year period.

Furthermore, by decision of local authorities, firms having JEI status may be exempt for seven years of the property tax on buildings (*taxe foncière sur les propriétés bâties (TFPB)*) and territorial economic contributions (*contribution économique territoriale (CET)*).

Additionally, it offers an exemption on option gains from sale of shares or units of the firm participating in the JEI scheme. Capital gains are taxed at a progressive rate, which is determined according to the time period the shares were held in the company. The allowance is set to 50 percent, if shares were held up till four years; 65 percent if the duration was between four and eight years and 85 percent if they were held between eight and ten years.¹¹

The qualifying R&D is defined according to OECD's Frascati Manual that includes basic, applied research and experimental development. The qualifying R&D expenditure covers a wide base of eligible expenditures, including "acquired property directly targeted at R&D activities, R&D personnel costs, a fixed share of operating costs, expenditure for conducting similar operations entrusted to public research organizations or universities, private research organizations approved by the Ministry of Higher Education and Research, or approved scientific or technical experts under the same conditions; costs of maintaining and registering patents; and depreciation and amortization of patents acquired to conduct R&D activities".¹²

The scheme is non-discriminatory in terms of sectors and geography. Firms can receive an immediate refund and benefit from the scheme even if they operate with no taxable income.

⁹Service-Public.fr, *Jeune entreprise innovante ou universitaire (JEI - JEU)*. Accessed on: August, 2014. Available at: <http://vosdroits.service-public.fr/professionnels-entreprises/F31188.xhtml#N100BB>

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¹²Senat, *Projet de loi de finances pour 2014 : Recherche et enseignement supérieur*. Accessed on August, 2014. Available at: www.senat.fr/rap/l13-156-322/l13-156-32221.html#fn90

The scheme is administered by the Ministry of Higher Education and Research. The response time for an application is set at maximum three months. Hence, if a firm applies until September the discounted rate can be applied for the previous year. Currently, application can be downloaded and then it must be submitted in a paper format to a specific department.

4.3 Impact

In 2011 around 2900 firms benefited from the JEI scheme, a number that increased from 2800 in 2010. Most of the beneficiary firms are micro-enterprises with less than 10 employees, making around 78 per cent of the total number of firms. Around 40 per cent of firms that use JEI scheme export to other countries. Exports in general make around one third of the beneficiary firm's turnover. More than half of the enterprises run the business with losses, reflecting the first-stage nature of those firms.

In 2012 a benefit of around EUR 91 million were offered through social exemption. In total between the year 2004 and 2012, the cost of the scheme was around EUR 890 million in terms of foregone tax revenue from social contribution exemptions. While in 2012 alone government costs for fiscal exemptions was EUR 20 million, in total, from 2004 to 2012 it was EUR 110 million.¹³

JEI has been evaluated by Hallépée and Garcia (2012). Using matching technique, they analysed firms with very similar characteristics but that did and did not participated in the scheme. They find that between the period 2002-2005, the scheme led to an 8.4 percentage point increase in employment for treated firms, an increase of survival rate, and higher wages. When considering a longer period between 2004 and 2009, they find that the treated firms appear to have had stronger sales growth and growth of added value. They also found that less than half of the beneficiary firms made profit. Nevertheless, they concluded that the increased R&D investments by the beneficiary firms were higher than the budget cost of the scheme, resulting in a bang-for-the-buck (BFTB) above one.

4.4 Reasons for highlighting this programme

JEI is one of the few R&D tax credit schemes that is explicitly targeted to young SMEs that perform R&D. At the same time, it is generic with respect the legal status, sectors and geographical locations it covers. The immediate refund option and short response time means that firms can obtain the funding faster, allowing them to invest the obtained additional funding in development activities.

Firms can enjoy the benefits only for eight years, assuring that the generous support is given only at the very early stage of business cycle. Furthermore, the novelty requirement of R&D represents advisable practice ("new to the world").

JEI has also been evaluated, and the studies concluded that the scheme had a positive impact on R&D activities and the general performance of firms.

4.5 Conditions of transferability

While the specific design of the tax incentive and the level of generosity might not be suitable for all countries, other member states could adopt France's practice of targeting fiscal support to young innovative firms as they face the largest constraints in obtaining funding.

¹³Fraichard, J. and Delcamp, H., 2014, *Exchange of good practices on R&D and innovation tax incentives*. DGCIS / DG Trésor. Presentation at the European Commission on 10th April, 2014

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5 Research and Development Promotion Act (WBSO) and Research en Development Allowance (RDA) (The Netherlands)

5.1 Background of the measure

The Promotion of Research and Development Act (WBSO) was introduced in 1994, with aim to stimulate research and development growth in the Netherlands. The argument behind WBSO was the classical market-failure discussion, as well as the concern about the high labour costs in the Netherlands that had a negative impact on the business environment (Verhoeven et al.,2012). The presence of WBSO was additionally motivated by the Lisbon and the following EU 2020 goals, setting investment in R&D as one of the key priorities. Currently, WBSO is the main policy instrument to promote private R&D, both in terms of scope and expenditure.

GERD in Netherlands have generally been above EU average, in 2012 making 2.16 percent (EU 28 average was 2.07 percent). From 2007 till 2011, the Netherlands, however, experienced a period where the R&D expenditure was below that of EU-28, reflecting the negative impact of financial crisis.

The government has expressed commitment to continue to support research and development activities, which is reflected in the most recent policy changes in 2014.

5.2 Description of good practice case

The WBSO offers companies to reduce the wage bill of R&D personnel by lowering social insurance contributions and the wage tax. The R&D tax credit is also available for self-employed that are carrying R&D activities. For self-employed the benefit is applied to income tax.

The rate of the tax credit decreases with the amount of expenditure. As of 2014, the upper limit of the first bracket was raised from EUR 200,000 to EUR 250,000. The credit rate in the first bracket is 35 percent, and in the second-14 percent. A ceiling of maximum benefit is set at EUR 14 million.

Self-employed who carry out at least 500 hours of R&D work in a calendar year, can receive a fixed amount of benefit- EUR 12,310. A supplementary R&D tax credit for start-up self-employed is also available, and is set as a fixed amount at EUR 6,157.

For non-personnel costs, a complimentary scheme -RDA- is available. In 2014 it offered firms to receive benefit at a rate of 60 percent (an increase from 54 percent), set against corporate tax (for firms) and income tax (for self-employed). To obtain the final discount, the rate can be multiplied by either the rate of corporate tax (25 percent X 60 percent: for each euro of company's costs and expenditures), or by a fixed RDA rate of EUR 15 (15 X 60 percent: per R&D hour). In case a firm does not have taxable income, it can carry back the expenditure one year or forward up to nine years. For self-employed, the carry back is available to three years and carry forward for nine years.

WBSO and RDA provide support to those R&D projects that fall into the following categories: development projects; technical and scientific research; analysis of the technical feasibility of in-house R&D; and process-oriented technical research. The novelty requirement for R&D is that it is "new to the firm"; it does not necessary need to be new in the overall state of knowledge.

The WBSO and RDA are administered by Netherlands Enterprise Agency, which is part of the Ministry of Economic Affairs. The agency also functions as a one-stop institution for the firms.

Application must be submitted online. Only projects that have been approved for WBSO, can also qualify for RDA. The application must cover at least three calendar months and may not exceed 12 calendar month (in 2014 this was changed from maximum six months previously). Firms may submit only one application for a given calendar month.

When firms complete the application, they are automatically guided through the process, with consultations available at the Netherlands Enterprise Agency. The description of the projects must be precise and measurable. The decision is made within three months.

When a firm has been granted the WBSO and/or RDA benefit, it is required to keep the administrative records of the relevant projects. Netherlands Enterprise Agency may hold an inspection within the firm to assure the validity of claims. In case the claims cannot be validated, the agency will correct the amount of benefit offered.

5.3 Impact

The official WBSO evaluations were carried out in 2002, 2007, and 2012. All evaluation studies find relatively large and significant benefits of the WBSO, indicating that one euro spent as foregone tax revenue, results in around one euro of additional R&D, consistent with international literature. In the latest published study Lokshin and Mohnen (2012) find that, on average, ten percent decrease in the user-cost of R&D capital induced by the tax credit leads to four percent more R&D capital in the short run and six percent more in the long run. They also find that small companies tend to have higher additional effect than large ones.

Cornet and Vroomen (2005) is the only evaluation of the WBSO that used a quasi-experimental design. They find that the WBSO provides large positive benefits for start-ups. The extension of the first tax bracket in 2001 is found to have a smaller, but still positive, effect.

Lokshin and Mohnen (2008) looked at the effect of the WBSO on R&D wages. They estimated that the elasticity between the effective rate of the Dutch payroll tax withholding R&D tax credit and average R&D wage is 0.2 in the long run.

Lokshin and Mohnen (2009) also performed a social cost-benefit analysis of R&D. They demonstrated that volume based R&D scheme does result in substantial dead-weight loss, as measure by BFTB below one. However, they show that even in such case, the the general welfare effect can still be positive due to spillover effects.

The budget of WBSO in 2014 is set at EUR 756 million, while of RDA at EUR 302 million.

5.4 Reasons for highlighting this programme

The WBSO and RDA are one of the schemes that rank highest in the benchmarking. It stems from their general character, wide scope of eligible R&D expenditure, and well-practiced administration procedures. Furthermore, a special preferential rate is offered to young firms. By design of the scheme, firms that do not have profitable income can still enjoy the benefit, which is especially beneficial to young firms.

WBSO also presents a well-developed administration practice. Application is carried online, a one-stop agency is available and the decision of the refund is made within three months. Additionally, the evaluations for WBSO are planned and frequent, and studies involve both quantitative and qualitative assessments.

5.5 Conditions of transferability

The good administrative practices in the Netherlands can be adopted in other countries by also offering online application and a manual explaining the application procedure that is available online. Other governments can also learn from the Dutch experience of evaluation practices that motivate better policy making and policy effectiveness.

The practice of targeting young start-ups by offering them a preferential rate could also be introduced in other member states.

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6 R&D Tax Credit (Ireland)

6.1 Background of the measure

Irish government focus towards R&D stems into the late 1990s when after decades of relatively low level of R&D spending and activity, Ireland changed its funding system to become more business-friendly and attractive to international investments. Since the early 2000s, when the expansion that was induced by the export-led growth appeared to be slowing down, government has set innovation as one of the priority areas for growth (Doran, Jordan, & O’Leary, 2012). Since then the investment in R&D has grown steadily; in 2012 gross domestic expenditure of R&D (GERD) made 1.72 percent from GDP¹⁴. In 2013, business expenditure on R&D (BERD) made 1.17 percent of GDP, which is an increase from 0.78 percent in 2003, a year prior to the introduction of the R&D tax credit. However, the level of BERD in Ireland is still below EU average, positioning itself nevertheless higher than it was in 2003.

R&D policy strategy in Ireland is in accordance with Europe 2020 goals. Within the strategy, the specific target set to Ireland is GERD to make 2.5 percent of GDP. Ireland’s R&D Tax Credit is part of the State’s Strategy for Science, Technology and Innovation 2006-2013, that recognizes the three elements as being “vital to economic and social progress”. The motivation behind R&D tax credit is to induce local and foreign firms to carry more R&D in Ireland (An Roinn Airgeadaeas, 2013).

The government’s efforts to support more R&D reflect its intentions to make Ireland essentially a knowledge-based economy, where investment in R&D is seen as one of the key elements. The aim of the R&D tax credit is to motive more private sector expenditure on research and development. As Ireland is relatively small and open economy, the government decided to make the R&D tax credit generic, available to wide set of activities and both local and international firms operating in Ireland.

6.2 Description of good practice case

Ireland offers firms a 25 percent tax credit for qualifying R&D expenditure. R&D must be carried in-house and within European Economic Area.¹⁵ The 25 percent rate is in addition to the 12.5 percent trading deduction, effectively making a tax subsidy equal to 37.5 percent. The credit can be set against firm’s corporate tax liabilities.

Initially government planned the R&D tax credit to be incremental. The base year was set to 2003, and has not changed since then. Thus, for companies that performed R&D in 2003, the tax credit is incremental, while for firms that entered the scheme after 2003, the scheme is volume based.

The definition of R&D is according to Frascati manual; basic, applied and experimental R&D is supported. A qualifying firm needs to demonstrate that it is seeking to achieve a technological advancement or resolve uncertainty.

Qualifying expenditure is broad and includes direct and indirect costs, as long as they are incurred in carrying R&D. This includes capital expenditure, personnel costs, royalties and overheads. Limited to certain restrictions, costs incurred on buildings or structures that were used for R&D activities, might also qualify. Namely, over a four year period, R&D activities must make at least 35 percent of the buildings’ usage.

¹⁴Eurostat, Europe 2020 Indicators: Headline indicators. Accessed on: 23rd August, 2014. Available at: epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators

¹⁵ Irish Tax and Customs, Research & Development. Accessed on: September, 2014. Available at: <http://www.revenue.ie/en/tax/ct/research-development.html>

Outsourcing may take place anywhere in the world, but is limited to 10 per cent of the overall eligible expenditure (or EUR 100, 000), with an additional 5 percent allowance for third level institutions. There is no restriction on the location of any IP generated from the R&D carried out.

The scheme does not have any brackets and the tax credit is refundable, in case the company does not have taxable income. These refunds are payable in instalments over three years and are limited by reference to corporation tax liability over the previous ten years, or two years worth of payroll taxes. The tax credit can also be carried back one year and carried forward indefinitely. Furthermore, no ceiling is set to the level of eligible expenditure over the base year of 2003.

The R&D tax credit is available to Irish tax residents: firms that are trading or part of a trading group. Otherwise, the R&D tax credit is not limited to a particular sector, size or age of a firm.

The R&D tax credit is administered by the Office of the Revenue Commissioners, which also works as a one-stop agency for firms. The application procedure for the R&D tax credit is based on self-declarations. Firms must apply for the credit with the annual corporation tax return. The application can be carried online.

A complimentary documentation backing up the claim for R&D tax credit is not necessary at the time of application. However, the necessary documentation needs to be maintained and readily available. The documentation needs to support two tests: (1) *the science test* showing that the activities carried under the project are in line with the policy definition of R&D; (2) *the accounting test* demonstrating that the claimed spending on R&D activities is correctly recorded. The Office of the Revenue Commissioners has also published guidelines of this required documentation to help firms to prepare for the applications. Additionally, firms can ask for an advance review on whether their expenditure qualifies for the R&D tax credit.

The Office of the Revenue Commissioners may audit a beneficiary firm within four year period in order to assure that the claim has been made correctly. Also, the 'Revenue department' may enquire more information about the claim or carry a full audit regarding the claimed expenditure. In case the audit reveals inconsistencies, a reduction in the claim and, accordingly, repayment of part or all of the benefit received may incur, where interest rates or penalties can also be applied.

6.3 Impact

A review of the R&D tax credit was announced by the Minister of Finance as part of Budget 2013. The aim of the evaluation was to assess whether the R&D tax credit is internationally competitive and represent a value-for- tax payer -money. The review intended to include a public consultation, economic analysis, survey of active R&D companies, analysis of Revenue data on R&D tax credit claims and an International review of other R&D tax incentive systems. However, economic analysis could not be carried due to data limitations.

The feedback received from the Consultation document was largely positive on the impact of the R&D tax credit, indicating that it did motive more R&D activity. The Consultation also demonstrated that the R&D tax credit played an important role in attracting FDI to Ireland. It also revealed that the R&D tax benefit scheme appeared to be important aspect in tax competition over R&D location decisions- it helped subsidiaries of multinational companies residing in Ireland to win R&D projects over other entities of the group.

The "negative tax" option has increased the popularity of the scheme, as it allows firms to receive cash refunds over a three- year period in case they do not have

taxable income. Effectively, firms can treat the cash refund as a grant, which in their yearly accounts can be treated as income “above the line”.

The results from the survey of active R&D firms demonstrated that the main economic sectors using the R&D tax credit are manufacturing (46.1 percent) and Information and Communication Technologies (23 percent). It also showed that local firms were more inclined to undertake basic and applied research, while multinationals-experimental, which made around 71 percent of all BERD.

R&D tax credit appears to be mitigating some of the financial risks related to undertaking R&D for smaller local firms. Those firms reported that the tax credit motivated firm to undertake more risky projects, and the negative tax was a crucial aspect in determining the cash-flows.

The survey demonstrated that for the majority of firms, the R&D tax credit was complimentary with government grants, as 82 percent of the survey respondents claimed both. It also showed that usually firms found out about the R&D tax credit through tax advisers.

The pool of firms using the R&D tax credit has widened extensively since the introduction of the credit in 2004. In the first year, 75 firms claimed the benefit, while in 2011 the number had increased to over 1400 companies. Those beneficiary companies in total employed almost 150,000 people and had a turnover of nearly EUR 100 billion.

The annual cost of the tax benefit scheme has increased substantially, rising from EUR 70.5 million in 2004 to EUR 261 million in 2011 (An Roinn Airgeadeas, 2013). The cash refund, as described above, is an important element in the R&D tax system, accounting for EUR 106 million of the total expenditure. The remaining EUR 155 represented corporation tax foregone.

The number of firms carrying R&D has increased over the years, making 1600 companies in 2011. While 75 percent of those firms were local, foreign owned enterprises made the largest share of total BERD in 2011- 71 percent. Such relation has remained relatively constant since 2007.

Indirect support through R&D tax credits make the largest share of total government support to private sector R&D, which was EUR 379 million in 2011. The remaining EUR 118 million were diverted through grants.

6.4 Reasons for highlighting this programme

Ireland’s R&D tax credits ranks as one of the best practices in the benchmarking. It performs especially well in organisation, as it has a simple application procedure, carried evaluation and consultations on the policy.

Ireland’s R&D tax credit is generic in its nature, covering a wide scope of eligible expenditure and offering a common rate to all types of. Such wide approach enlarges the pool of applicants. Including foreign companies is important for a small and open economy as Ireland, since it can promote foreign direct investment (FDI) inflows and positive spillovers from larger international companies carrying R&D.

Furthermore, the scheme represents a good organisation practice. The application procedure is relatively simple, offering online application, one-stop agency and guides. Even though an econometrical evaluation of the effects of the R&D tax credits was deemed impossible, consultation and survey of firms indicated that the R&D tax credit system is viewed as beneficial to motivating more R&D in the private sector.

6.5 Conditions of transferability

Other member states can transfer Ireland's experience of the R&D tax credit's generic approach, the wide scope of eligible R&D expenditure covered, and an R&D definition that is in accordance with OECD's Frascati Manual.

Other countries can also adopt the administrative practice, which includes online application, a one-stop agency and a relatively easy application procedure.

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7 SR&ED (Scientific Research and Experimental Development Tax Incentive Program) (Canada)

7.1 Background of the measure

Canada has a mature and longstanding tradition in supporting research and development activities through indirect policy measures. While SR&ED is still the largest single instruments of federal government support for private R&D, recent government reforms has made the tax credit less generous. At the same time, government has strengthened the direct support to R&D activities by introducing new grants supporting specific regions and industries.

The claim behind SR&ED is the classical market failure argument, stating that markets alone will produce lower levels of R&D than socially desirable. The underlying idea of the tax benefit is to lower the associated financial risks, by decreasing the real costs of R&D investments. The overall goal is, thus, to stimulate the scientific effort in Canada (Madore, 2006).

SR&ED policy has been reviewed various times and the focus of reforms differed by period. In the first period from 1944 until 1986, the introduction of the traditional deductions and R&D tax credit was accompanied by several other tax measures that were tested and eventually stopped since they were found inefficient. Policy changes in the second period between 1987 and 1994 were largely made in the organisation phase, when the tax credit and deductions were adjusted in order to simplify the use of the measures and enhance the administrative practice. Since 1995, the focus has been on broadening the beneficiary pool, by expanding and facilitating the access to SR&ED program (Madore, 2006). The most recent changes were announced in the 2012 federal budget with reforms taking effect in 2013 and 2014.

7.2 Description of good practice case

Currently SR&ED tax incentive program consists of two types of benefits.¹⁶ First, it allows companies to deduct qualifying expenditure from income for tax purposes.¹⁷ Secondly, it includes an SR&ED Investment Tax Credit (ITC) which allows companies to reduce the taxable income. In case a company does not have taxable income or has very low tax liability, the tax credit may be partly or fully refunded.

R&D is defined according to Frascati Manual, and applies to experimental, applied and basic research. The novelty requirement of R&D activities is "new to the world".

As of 2014, the eligible costs include current expenditure such as wages, materials, outsourced activities (limited to 80 percent) and some overhead.

For "Canadian-controlled private corporations" (CCPC), a 35 percent tax credit applies. The tax credit can be applied to federal tax due.¹⁸ CCPC are defined as:

- "Private corporation that is established in Canada;

¹⁶Canada Revenue Agency,2014, Who can claim SR&ED tax incentives and what are the benefits?Accessed on: 10 October 2014. Available at:<http://www.cra-arc.gc.ca/txcrdt/sred-rsde/clmng/whcnclmsrd-eng.html>

¹⁷As from January 2013, the capital expenditure in property acquired after 2013 has been excluded from the eligible expenditure.

¹⁸ Canada Revenue Agency,2014, Who can claim SR&ED tax incentives and what are the benefits?Accessed on: 10 October 2014. Available at:<http://www.cra-arc.gc.ca/txcrdt/sred-rsde/clmng/whcnclmsrd-eng.html>

- Not controlled by non-residents or government agencies; proprietorships, partnerships and trusts; and other corporations;
- 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 exchange, were owned by one person, that person would not own sufficient shares to control the corporation;
- No class of its shares of capital stock is listed on a designed stock exchange.”¹⁹

For CCPC ITC is 100 percent refundable on qualified current expenditure up until CAD 3 million of the qualifying expenditure. On amount that exceeds the mentioned ceiling, small CCPC is offered to receive a 15 percent refundable tax credit, for other CCPC the tax credit is non-refundable (Canada Revenue Agency (2014) Who can claim SR&ED tax incentives and what are the benefits?).

For non-CCPC (for tax year ending after 2013) the SR&ED Investment Tax credit is a 15 percent tax credit applied to all eligible costs undertaken in Canada by individuals or trusts, partnership or corporations. For corporations the tax credit is not refundable, while for individuals and trusts the ITC is 40 percent refundable. As partnerships are not a taxpayer, usually the R&D expenditure must be calculated at the partnership level and then divided among the eligible members (trusts, corporations or individuals).²⁰

Firms are required to file the specific SR&ED claims along with income tax forms electronically. Different sorts of application assistance is available (First-time advisory service, SR&ED Self-assessment and Learning Tool, Preclaim Project Review, Account Executive Service (assign a contact person that assists in the process) and an assistance to resolve the claimant’s concerns in case the entity does not agree with the results of a review). Furthermore, it is possible to subscribe for the SR&ED mailing list that informs about the different policy changes. The maximum time limit within which the claims should be processed is set out in “Service standards”; 120 days for refundable tax credits and 365 days for non-refundable. In practice, the response time is half of the planned time.²¹

7.3 Impact

SR&ED has been evaluated by academia and the government on several occasions. Econometric impact studies generally consider the combined effect of the tax credit, possibilities for accelerated depreciation, and other innovation policies including the sometimes elaborate R&D tax incentives at the provincial level.

More recently, Baghana and Mohnen (2009) analyzed manufacturing firms in Quebec between 1997 and 2003. They found that small firms were more responsive to the tax

¹⁹Canada Revenue Agency, Canadian-controlled private corporations ,2014, Accessed on: 10 October, 2014. Available at: <http://www.cra-arc.gc.ca/tx/bsnss/tpcs/crprtns/typs/ccpc-eng.html>

²⁰Canada Revenue Agency, 2014, Who can claim SR&ED tax incentives and what are the benefits? Accessed on October 10, 2014. Available at: <http://www.cra-arc.gc.ca/txcrdt/sred-rsde/clmng/whcnclmsrd-eng.html>

²¹Canada Revenue Agency,2014,SR&ED Program Service Standards. Accessed on October 10, 2014.Available at: http://www.cra-arc.gc.ca/txcrdt/sred-rsde/srvc_stds-eng.html

incentives than large firms, for both the impact being larger in the long run. They also demonstrated that the volume based R&D tax incentives were associated with dead-weight loss, which was particularly strong for large companies.

Czarnitzki et al. (2010) analyzed the impact of R&D tax incentives on innovative outputs, i.d., product innovation and the sales share of new or improved products, and general performance of the firm. They observe manufacturing firms between 1997 and 1999. By applying matching technique, they found that firms enjoying the R&D tax incentive benefits performed better in terms of number and sales of new products. However, they found that the R&D tax incentives did not induce firms to perform better in terms of more general firm performance indicators that would follow from stronger innovation output. They argue that, while companies may indeed spend more in R&D, they may invest in short-term projects that have lower marginal returns than projects implemented in the absence of the tax measures.

A full welfare analysis of SR&ED was carried by Parsons and Phillips (2007). They evaluated the program, taking into account four aspects: (1) relationship between firm R&D expenditure and the R&D price; (2) the spillover effects from additional R&D expenditure; (3) the costs of the increased tax burden; and (4) the administrative and compliance costs of the tax credit. Parsons and Phillips also reviewed the econometric literature analyzing the impact of R&D tax incentives. They then use the median of the estimate of input additionality as a component for their analysis.

On costs side of the policy, they estimated that the administrative costs were around CAD 0.02 and compliance costs CAD 0.08 per one dollar as foregone tax revenue.

While the exact result is sensitive to different model specifications, they concluded that the tax incentive had a positive welfare effect; an increase of around 11 cents for every dollar spent in terms of foregone tax revenue. They noted that "given a tax subsidy of CAD 2.9 billion, present in 2004, the net welfare increase was more than CAD 300 million for each year the subsidy was in place" (Parsons and Phillips, 2007). When compared to direct assistance, they found that grants appeared to be inducing more additional R&D expenditure than the fiscal measures. However, R&D tax incentives resulted in larger spillover effects than direct instruments. The effect on net welfare can, therefore, be unclear.

In 2013 the budgeted government costs of SR&ED tax credit were CAD 3.3 billion, of which CAD 1.5 billion were refundable credits. This represented over 23,000 companies, from whom 20,000 were small CCPCs.²²

7.4 Reasons for highlighting this programme

Canada has a very thorough organization system: one-stop agency, online application and several facilities that offer assistance in claiming the tax credit. R&D tax credits in Canada have also been evaluated both academically and by the government on wide set of outcomes, including a throughout analysis on general welfare effects.²³ Additionally, the design of Canada's R&D tax credit has been very stable, which greatly increases the investment visibility for the firms.

7.5 Conditions of transferability

Canada's organisational practices regarding public consultation and the stability of the scheme can also be embedded in the legal systems of other countries. Similarly, the

²² Warda J., 2014, Presentation in the 2nd Workshop of "Exchange of Good Practices on R&D tax incentives", Brussels

²³ See, for example, Baghana and Mohnen (2009), Czarnitzki et al.(2011), Parsons and Phillips (2007)

practice of frequent governmental and academic evaluations can be implemented in other countries, conditional on the availability of high-quality micro data.

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8 Incentivos fiscales a la I+D+i (Fiscal incentives to research, development and innovation (Spain))

8.1 Background of the measure

Before the financial and economic recession, which severely impacted the country, Spain experienced substantial increase in R&D expenditure. GERD as a percentage increased from 0.92 percent to 1.39 in 2009 and 1.40 in 2010. In 2012 it, however, dropped to 1.3 percent.

Relatively recently introduced R&D and innovation strategies are a response to suggestions of several throughout studies that indicated the weak points of Spain's innovation system. The new strategy for R&D and innovation EESTI (2013-2020) that is also in line with EU 2020 goals sets five priority areas: (1) Coordination of R&D and innovation policies; (2) Stable framework; (3) Quality and social impact; (4) Efficiency and accountability; and (5) Gender issues (Fernandez-Zubieta, 2013).

The current design of the R&D tax incentives is largely based on the system established in 2004. However, fiscal support for R&D and innovation activities has been present since 1978 when 10 percent tax credit was offered for R&D costs.

Even though the R&D tax incentives have been amongst the most generous in OECD, up until recently the success of the measures was hampered by burdensome and time consuming application process. The recent change of policy mix and amendments to administrative practice has made a promising ground for R&D tax incentives to become more efficient and effective (Fernandez-Zubieta, 2013)

8.2 Description of good practice case

Since the introduction of the current design of R&D tax incentives in 2004, the measure has been reviewed various times. The last changes were made in 2013. It currently offers several types of R&D tax instruments that are each targeted to some specific aspect of innovation activity. A 25 percent R&D tax credit is offered to the total amount of qualifying R&D expenditure, with additional 17 percent available for researchers carrying R&D activities. Additionally, a reduction of 40 percent is available for the social security contributions of personnel employed in R&D or technological innovation activities.

In case the current amount exceeds the average of the previous two years, the company receives a 25 percent tax credit on the total current volume, and 42 percent tax credit on the excess over that base amount.²⁴ Additionally, investment in tangible and intangible assets (excluding buildings and land) that are exclusively utilized for R&D purposes, are offered an 8 percent deduction.

A 12 percent *Innovation tax credit* applies for costs that are incurred from research activities that resulted in technological innovation of new products or productions processes, as well as substantial improvements in the existing ones.

Qualifying research is defined as "original planned investigation that seeks to discover new knowledge and greater understanding in the science and technology", while development as "application of the results of investigation activities aimed to produce new materials, products or design new production processes or methods, as well as substantial technological improvement of materials, products, processes and

²⁴MINECO, Innovacion: Definiciones y Gastos deductibles. Accessed on: August, 2014. Available at:

<http://www.idi.mineco.gob.es/portal/site/MICINN/menuitem.7eeac5cd345b4f34f09dfd1001432ea0/?vgnnextoid=b5bdf293d4b35410VgnVCM1000001d04140aRCRD>.

previously existing systems” (Article 35.1.a in *Texto refundido de la Ley del Impuestos sobre Sociedades*).

Federal fiscal incentives in Spain have a generic approach; they are not targeted to any specific region, legal form, size of firm or activity. However, in order to support those companies with liquidity issues, an immediate deduction and a cash-refund in case a firm does not have taxable income is possible.

In order to qualify for the tax benefits, firms are not required to have any minimum amount of the qualifying R&D expenditure. However, a maximum limit of the tax benefit that a firm can receive applies. If (after reducing for the tax credits), the total amount of qualifying R&D spending is larger than 10 percent of the tax due, the tax benefit may not be larger than 50 percent of the total tax liability. If the total amount of R&D spending is not larger than 10 percent of tax liability, the tax credit can be applied to up to 25 percent of the total tax liability. Unused credits can be carried forward 18 years. However, entities may opt not to apply these limits to the tax credit for R&D activities generated in tax periods commencing from January 2013 onwards. The additional amount of qualifying expenditure is reduced by 20 percent and it may not exceed EUR 1 million in case of technological innovation activities, and EUR 3 million for joint R&D and technological innovation activities (Ministerio de Economía y Competitividad, 2014).

Currently, fiscal incentives for R&D and innovation are administered by the Ministry of Economy and Competitiveness (previously Ministry of Science and Innovation that was closed down as a result of new strategy). However, the ministry has announced a creation of new Spanish Research Agency, which, together with Centre for Industrial Development (CDTI), will be the main funding bodies of R&D and innovation activities. It is planned that while Spanish Research Agency will be the main responsible for the research oriented projects, CDTI will administer activities directed at companies (Fernandez-Zubieta, 2013).

Application should be filed together with the corporate tax declaration at the end of the project. The procedure can be carried online. Firms may apply for pre-validation of the application, which are binding for tax authorities at the moment of actual application. Guides and a one-stop agency that can assist in the application processes are also available.

8.3 Impact

The impact of the recently introduced measures has not been evaluated yet, as they are relatively new. However, various evaluations have been carried to assess the effects of the previous designs of the Spain’s R&D tax credit schemes. Corchuelo and Martínez-Ros (2009) found that the R&D tax credits had a positive impact in large and medium and hi-tech firms. They also noted that SMEs enterprises were less likely to know about the tax incentives. Such tendency substantially lowers the take up rates, as SMEs are predominant in Spain’s economy.

Busom et al. (2012) additionally found that small and financially constrained firms were more likely to use R&D subsidies than tax incentives. However, SMEs with IPR-protected innovative products were more likely to use R&D tax incentives than subsidies.

According to a recent survey conducted by the Spanish Confederation of Business Organizations (Confederación Española de Organizaciones Empresariales [CEOE]), 85 percent of the surveyed companies believed that elimination of fiscal incentives for R&D and innovation would have a negative impact on business competitiveness at the national level (CEOE, 2013). 55 percent of the enterprises said that in the absence of the tax incentives, they would decrease their R&D and innovation expenditure by more

than 33 percent. 26 percent revealed that they would decrease the number of qualified R&D personnel by more than 25 percent.

42 percent of the surveyed admitted that in case the tax incentives for R&D and innovation would be abandoned, the competitiveness of their companies would substantially decrease, especially internationally; it would also slow down the commercialization of products. 94 percent of the surveyed said that the presence of fiscal incentives had promoted more investment in R&D. Similarly, 81 percent admitted that the tax credit has motivated to hire more R&D personnel, with largest share (48 percent) hiring been between three and ten additional employees.

The survey also showed that the option to pre-validate application has turned out to be highly popular, as 82 percent of firms that applied for the fiscal incentives used it (in 2008 only 31 percent of companies did so). More than half of the enterprises claimed that the possibility to obtain pre-validations have increased their competitiveness with respect to other firms, as it has increased the certainty of funding.

The average annual cost of the tax incentives, in terms of foregone tax revenue, was EUR 200 million-300 million in 2002-03 and over EUR 300 million to 400 million in 2004-08, reducing to EUR 200 million in the last years (Fernandez-Zubieta, 2013).

8.4 Reasons for highlighting this programme

Spain's fiscal incentives for R&D and innovation ranks in top ten in the benchmarking exercise. This stems from numerous of elements. First, Spain's R&D tax credit system is one of the most generic- it does not target explicitly the scheme to any particular size of the firm, region or activity (although the autonomous regions can have specific schemes as well). This is considered an advisable approach, as it simplifies the system and does not additionally distort the market processes. Secondly, the recently introduced option to receive a cash-refund and to carry over all or part of the R&D expenditure gives firms more flexibility in their investment decisions, which is especially important for young firms. Entities can also apply online and receive a pre-validation of the qualifying expenses that lower the compliance costs of firms

The high ranking of Spain's R&D tax incentives in the benchmarking have largely been induced by the recent policy changes, which is the core reason for highlighting Spain's experience. The government of Spain has recently introduced number of measures to improve the efficiency of R&D and innovation policy in Spain. This included improving the coordination between national and regional measures, putting emphasis on innovation and public-private research and development cooperation, as well as improvement of administration practices and implementation of more diversified set of instruments, among other things (Fernandez-Zubieta, A., 2013). While various other structural and governance challenges remain, such reforms can be viewed as advisable practice, as they have been strongly linked with those recommendations set out by national and international analysis.

8.5 Conditions of transferability

The challenges faced by Spanish innovation system are not unique, but are applicable also to other EU member states. The practice of basing structural reforms on suggestions laid out in thorough evaluations is recommendable. The way in which the Spanish government has pursued reform can provide inspiration to other countries.

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9 Enhanced allowance for R&D expenses (Croatia)

9.1 Background of the measure

Having joined EU in 2013, Croatia in the last decade has taken numerous measures to strengthen its research capacity and harmonize research oriented policies with EU and the European Research Area. The downside of the reforms has been the slow implementation of the measures, lack of reliable statistical data and the administrative capacity (European Commission, 2013).

The "National Strategy for the Croatian innovation development 2013-2020" that was carried by OECD and local experts identify the weaknesses of Croatia's innovation system and sets five strategic goals of reforming the research system: (1) Enhance business innovation potential and create a regulatory environment in support of innovation; (2) Increase knowledge flows and interactions between industry and academia; (3) Secure a strong science and technology base and strengthen the capacities of research institutions for technology transfer; (4) Strengthen human resources for innovation; and (5) Improve governance of the national innovation system. It also lays out 40 guidelines for implementation of the necessary policies.²⁵

One of the measures that the Croatia's government has introduced to stimulate more private R&D spending, are fiscal incentives for R&D. Already since 2004 firms are able to reduce income tax liability for R&D activities (Act on Income Tax (Official Gazette 177/04, 90/05, 57/06, 146/08, 80/10, 22/12, 148/13) and Instructions on Income Tax (Official Gazette 95/2005) (Švarc, 2013). However, the current design of enhanced allowance for R&D expenses was established in 2007 by the "Decision on the state aid for R&D and innovation in a form of tax reductions for companies".

9.2 Description of good practice case

Croatia offers enhanced allowance regime for R&D expenditure, setting different rates to fundamental, applied, and development research projects, as well as technical feasibility studies. The definitions of R&D activities are in line with OECD's Frascati Manual.

The highest rate of benefit, at 150 percent, is available for fundamental research; for every EUR 100 spent, firm can deduct additional EUR 150. Fundamental research is defined as "those activities that are not linked with any industrial and/or commercial goals and that are targeted at expanding the scientific knowledge and know-how" (Deloitte, 2014).

Research projects that qualify under "applied research" receive 125 percent super deduction. Those activities include "all planned research or critical exploration with the target to obtain new knowledge that could be used in the development of new production processes, services or products, or for significant improvements in the already existing production processes, services or products".

For development research projects a hundred percent super deduction is available. Development research is defined as those activities that are "aimed at converting the applied research results into plans, drawings or models for new, modified or improved products, productions processes or services that are intended either for sale or use, including the manufacturing of prototypes. In addition, development research may include conceptual planning and modelling of alternative products, production processes or services as well as the first demonstration or pilot projects, provided that those projects cannot be redesigned or used for industrial application purposes or

²⁵Erawatch, Country pages: Croatia. Available at: http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/hr/highlights/highlight_0007. Accessed on: September, 2014

commercially exploited. Development research does not include routine or regular alterations of products, production lines, production processes, existing services and other current activities, even though those alterations represent improvements” (Deloitte, 2014).

The total amount of the benefit, however, cannot exceed 100 percent of eligible costs for fundamental research, fifty percent of eligible costs for applied research and 25 percent of eligible costs for development research.²⁶

Within the R&D tax incentive scheme, a preferential tax treatment is also available to those activities that are performed prior to starting an R&D project; aimed at assessing, whether there is sufficient technical expertise to carry the project ((Deloitte, 2014). Small and medium sized enterprises can receive up to 75 percent super deduction, while large firms 65 percent. Overall, the deduction can be applied for up to 50 percent of eligible costs for SMEs and 40 percent to large companies.²⁷

The scope of eligible costs is broad and includes R&D personnel costs, input materials and maintenance costs, as well as costs of contracted services that are related to the R&D project. Other costs incurred more indirectly in the project, such as overhead and necessary insurances, also qualify.

Within the regime, an accelerated depreciation is available to those capital expenses related with the research project. Also, an accelerated depreciation is offered to purchase of patents or license fees of technologies exploited in research activities.

The scheme does not particularly target the support to any type of firm or activities. It also does not have a regional character. For firms that carry losses, the tax incentive can be carried forward for five years.

The application form must be submitted to the Ministry of Science, which assess whether the claimed activities qualify under the definitions of R&D and the specific sub-category (fundamental, applied, development or technical feasibility project). In case the Ministry of Science encounters that the claimed activities are not consistent with a specific definition, they may downgrade the project to a lower ranking type (e.g., from fundamental to applied research). The process of the verification is regulated by the Regulation on State Aid for Research and Development Projects (¹Aralica, and Botrić, 2013).

The application form must be submitted before the end of the financial year in which the project started (Deloitte, 2014). The expected decision time is around 30 days. The drawback of the application procedure is that it cannot be done online, and a one-stop agency is not available.

9.3 Impact

The effect of R&D tax incentives in Croatia has been evaluated by Aralica and Botrić (2013). The project was financed by the World Bank and the Ministry of Science, Education and Sports, as part of the project “Evaluation of the Tax Incentives Aimed at Stimulating R&D Projects in the Business Sector” that took place in 2011.

Aralica and Botrić applied propensity matching techniques to assess whether firms using the R&D tax incentives had better R&D performance than those firms with similar characteristics but that did not enjoy the fiscal incentives.

²⁶The Act on the Amendments to the Scientific Activity and Higher Education Act (Official Gazette No. 46/2007)

²⁷The Act on the Amendments to the Scientific Activity and Higher Education Act (Official Gazette No. 46/2007)

In a sample of 96 firms they overall conclude that the incentives had a positive impact on R&D performance, finding that firms with the R&D tax incentive had higher R&D expenditure. While they do not found any significant impact on process innovation, the tax incentives had a positive impact on product innovation.

They also estimated that those firms being part of a larger group had higher probability to receive the tax benefit. However, they did not find that the size of the firm or whether the firm participated in international markets, had an impact on participation.

Aralica, Botrić and Švaljek (2011) use both a qualitative (firm survey) and quantitative (Heckman two-step estimation method) approach to analyze the impact of R&D tax incentives. While they found that the beneficiary pool is highly heterogeneous, overall, the tax incentives resulted in higher R&D expenditure and innovative performance, as measured by a variable whether the firm "introduced in the market new of significantly improved product" (based on CIS survey).

Based on survey responses that included specific questions on R&D expenditure, they also estimate bang-for-the-buck (BFTB); on average the R&D tax incentives resulted in a BFTB of 1.19. Hence, on average, they estimated that the increase of R&D expenditures out-weighted the government costs in terms of foregone tax revenue. They also split the sample in percentiles according to R&D expenses/sales ratio (*R&D intensity*). It demonstrated that the largest additionality was for those firms whose R&D intensity was above 15th percentile (firms with higher R&D intensity).

Švaljek (2012) provided statistical overview of the R&D tax incentives. Švaljek found that according to the available data for 2008 and 2009, R&D tax incentives have resulted in substantial savings for their beneficiaries, reducing the effective profit tax rate significantly below the statutory rate.

The analysis showed that 272 firms in 2008 and 261 companies in 2009 benefited from the tax incentive. Small firms accounted for the largest share of beneficiaries: in 2008 there were 216 small, 25 medium and 20 large firms. Similarly, in 2009, 195 small, 29 medium and 24 large firms used the scheme. At the same time, Švaljek found that the distribution of financial benefits from R&D tax credits was very heterogeneous, with large firms having above proportional share in total R&D expenditure claimed.

Over the same period, most of the tax benefits were claimed in electronics and communication sectors (in 2008: 22 percent and in 2009: 44.8 percent of all tax incentives); and pharmaceutical industry (in 2008: 55.5 percent and in 2009: 17.3 percent) (Švaljek, 2012).

R&D tax allowance had a strong regional bias, with firms located in the region of Zagreb accounting for more than 90 percent of total incentives distributed (Švaljek, 2012).

9.4 Reasons for highlighting this programme

While the R&D tax incentive regime in Croatia has drawbacks when it comes to organisation, this scheme stands out because it links the super deduction rate with a project's novelty. Projects that have higher level of novelty, receive higher level of tax benefits and vice versa. In this way, those activities that are likely to have the largest gap between social and private returns, and for which market failures are most profound, receive a higher tax benefit.

The option to receive a tax benefit for technical feasibility projects can be important for more financially constrained firms that see opportunities for R&D, as a tax benefit is available for the first stages of the R&D project.

Furthermore, the R&D tax allowance in Croatia has already been evaluated through an econometric study. To our knowledge, Croatia is the only new EU-member state that has undertaken such analysis. Such practice is advisable also to other member states.

9.5 Conditions of transferability

The practice of offering a rate of benefit that is linked with the level of novelty of a project can be adopted by other member states, including the use of the definitions of types of R&D activity stated in OECD's Frascati Manual. Other countries can also consider the possibility of offering a tax benefit for activities required to assess the feasibility of a project, which may be especially important for young firms.

Even though the dataset that was used for the evaluation of the tax allowance, revealed several issues, it is recommendable to implement econometric evaluations already in the early stages of policy reform. Such evaluations not only inform policy makers of the effectiveness of the instrument but also demonstrate the quality of the data and scopes for improvement.

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10 Crédit d'Impôt Innovation (France)

10.1 Background of the measure²⁸

Innovation Tax credit (Crédit d'impôt innovation- CII) was introduced in 2013 as an extension to the longstanding program of Crédit d'impôt recherché (CIR).

The CII is available only to SMEs and applicable to downstream activities, like expenditure for new prototypes and pilot assets. Such activities are not necessarily considered as R&D, however they support innovative activity in a firm.

The measure aims to extend the scope of eligible expenses for SMEs. The aim is to induce the competitiveness and growth by encouraging SMEs to raise their innovative activities.

10.2 Description of good practice case

Innovation Tax credit (Crédit d'impôt innovation- CII) offers companies that qualify as Small and medium enterprises (SME) a tax credit of 20 percent for expenditures incurred after January 2013 in creation of prototypes and pilot assets. SMEs are defined according to EU definition: companies with less than 250 employees and turnover below EUR 50 million or the total balance sheet not exceeding EUR 43 million. The ceiling of maximum benefit that a firm can receive under CII is set at EUR 400,000.²⁹

In order to qualify, the expenditure must be incurred in prototype development or pilot project of new product installation. A prototype is defined as "an original model that has all the technical qualities and all the operating characteristics of the new product or process". The model does not necessarily need to be final but it should help dispel uncertainty about the product improvements and to determine its characteristics. Pilot installation concerns "creation of set of devices for testing a product or process in an environment close to that of the real world". The novelty requirement for intended product is defined as "tangible or intangible property that is not yet on the market, and which differs from existing or previous products with superior performance in technical aspects, eco-design (reduced environmental impact for the use of raw materials, manufacturing processes, distribution or the product's end-of-life), and ergonomics of the product usage or functionality". Prototypes or pilot plants for products that are simply new to the firm, do not qualify for the scheme.³⁰

The covered costs are in line with CIR and can be generally divided into the following categories:

- depreciation allowances related to new or acquired facilities used directly as a pilot plant or prototyping design unit;
- personnel costs that have been exclusively dedicated to the qualifying activities;

²⁸ For more details on background see Case Study on Jeune Entreprise Innovante (JEI) (France)

²⁹ APCE, Crédit d'impôt innovation. Accessed on: September, 2014. Available at: <http://www.apce.com/cid136960/credit-d-impot-innovation.html?pid=355>

³⁰ Legifrance, Article 71, LOI n°2012-1509 du 29 décembre 2012, Accessed on: September 2014. Available at: http://www.legifrance.gouv.fr/affichTexteArticle.do;jsessionid=3DF1EF569FD712E701FB5CA62DE3DAA6.tpdjo03v_1?idArticle=JORFARTI000026857540&cidTexte=JORFTEX T000026856853&dateTexte=29990101&categorieLien=id

- Operating costs: 75 percent of depreciation allowances and 50 percent of personnel expenses;
- costs incurred in registration, administration and defence of intellectual property rights;
- external costs for activities sub-contracted to qualified institutions (engineering services, technical design agencies, industrial technology centres).

Ministry of Higher Education and Research (MESR) is the responsible and administrative body of the R&D tax schemes. The application procedure is the same as for CIR, and can be done together. Firms can download the application form online, which afterwards needs to be sent to MESR in paper format. In the application form the firms need to clearly state the undertaken activities, demonstrate the novelty of the product and state the associated expenditure to be claimed.

In order to assure the eligibility of the expenses, companies may ask authorised entities a pre-approval of the projects. The decision of this pre-approval is binding to tax authorities at the time when the actual claim takes place. The request for pre-approval must be made at least six months before the deadline of the application (April 2014 for expenditure incurred in 2013). The authorities should respond in three months' time. The same standard is set for the response time of the actual claim).³¹

After successful application, the amount of CII is deducted from corporate or income tax for the year in which the expenditure incurred. The excess tax credit amount can be applied for the following three years after the original tax claim was made. After this period, the unused amount will be paid out cash. Firms can also request an immediate reimbursement of CII, which is especially important aspect for more liquidity constrained firms.

CII can be combined with CIR and the tax credit for competition and employment (Crédit d'impôt pour la compétitivité et l'emploi (CICE)). Here, however, the firm needs to separate the expenses, as a double-claim for one and the same expenditure is not allowed. In case CIR and CII is combined and the company has prototyping or pilot activities that would qualify for both of the tax credits, the firm must distinguish those activities within the research phase (dissemination of scientific uncertainty and/or technical activity undertaken to increase the stock of knowledge) and those that refer to of innovative activity (the definition of a new product). It is also possible that the firm's expenditure does not qualify for CIR, but lies under the definition of qualifying expenditure for CII. In this case, the firm can obtain only CII.

10.3 Impact

Since CII has been introduced very recently, ex-post evaluation of the tax credit has not yet been undertaken.

The planned budget cost of CII in terms of foregone tax revenue was projected to be EUR 152 million in 2014. When the tax credit should be at full course (projected from 2018), the annual cost is predicted to be EUR 200 million.³²

³¹ Ministère du Redressement Productif, Direction Générale de la Compétitivité de l'industrie et de services, Le crédit d'impôt innovation (CII)[Presentation]. Available at: http://www.direccte.gouv.fr/IMG/pdf/Presentation_Credit_d_impot_innovation.pdf

³² Project LOI Finance 2013 (*Finance Bill*). Available at: <http://www.economie.gouv.fr/files/projet-loi-finances-2013-plf-synthese.pdf>

10.4 Reasons for highlighting this programme

Creation of prototypes and pilot assets are a necessarily part of innovation. A strong capacity for prototyping is a cost- and time-efficient way for firms to try and experiment new ideas before actually launching them in the market. Building a prototype or a pilot project can also be used as a demonstration tool for investors, which is especially useful for young start-up companies.

Crédit d'impôt innovation is a tax credit that exclusively offers a tax benefit for such activities that may not fit into the general definition of research and development and normally would be excluded from the eligible expenditure of R&D tax incentives. A risk of tax incentives for prototyping might be that not all forms of prototyping are equally innovative. Just like with other R&D tax incentives, a novelty requirement needs to ensure that innovation rather than imitation is rewarded.

10.5 Conditions of transferability

Even though the CII has a clear role in supporting SMEs and might decrease information asymmetry between entrepreneurs and investors, it is not obvious that the instrument will effectively address market failure due to knowledge spillovers. For the measure to be successful, a strong administrative capacity must be in place. This will ensure that the novelty requirements of the claimed expenditure are fulfilled. When a country does not have such a capacity, the incentive may have an adverse effect on innovative activity in a country because competitor firms may receive tax subsidy for trying out products that are only new to their firm, replicating innovative ideas from other companies.

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