# R&D Subsidies: Large Firms and SMEs

It is commonly agreed that research and development (R&D) is subject to potential market failure. One reason is that expenditures for R&D create significant spill-over effects. At the same time, R&D plays an important role for productivity growth. R&D is, therefore, one important area for government intervention.

In most OECD countries R&D aid is generally horizontal in nature and not targeted at a particular sector. Industrial policy targeted at R&D can, of course, take various forms with tax subsidies only being one of the possible instruments.

The following Table compares the percentage rate of tax subsidies for R&D for OECD countries. Tax subsidies are calculated as 1 minus the B-index. The B-index is compiled by the OECD to compare tax treatment of R&D investment. "The B-index is defined as the present value of before tax income necessary to cover the initial cost of R&D investment and to pay corporate income tax, so that it becomes profitable to perform research activities. The more favourable a country's tax treatment of R&D, the lower its B-index" (OECD 2007). For example, in Spain, 1 unit of R&D expenditure by large firms results in 0.39 unit of tax relief.

The Table does not confirm a traditional pattern of lower levels of R&D effort in Europe compared to

**Table**

**Rate of tax subsidies for one US dollar of R&D[a], large firms and SMEs, 2006–07**

| | SMEs | Large firms | | SMEs | Large firms |
|---|---|---|---|---|---|
| Austria | 0.088 | 0.088 | Slovak Republic | –0.008 | –0.008 |
| Belgium | 0.089 | 0.089 | Spain | 0.391 | 0.391 |
| Czech Republic | 0.271 | 0.271 | Sweden | –0.015 | –0.015 |
| Denmark | 0.161 | 0.161 | United Kingdom | 0.106 | 0.096 |
| Finland | –0.008 | –0.008 | | | |
| France | 0.189 | 0.189 | Norway | 0.232 | 0.207 |
| Germany | –0.030 | –0.030 | Switzerland | –0.010 | –0.010 |
| Greece | –0.011 | –0.011 | Turkey | 0.139 | 0.139 |
| Hungary | 0.162 | 0.162 | | | |
| Ireland | 0.049 | 0.049 | Australia | 0.117 | 0.117 |
| Italy | –0.023 | –0.023 | Canada | 0.325 | 0.179 |
| Luxembourg | –0.014 | –0.014 | Japan | 0.162 | 0.118 |
| Netherlands | 0.239 | 0.066 | Korea | 0.158 | 0.180 |
| Poland | 0.022 | 0.010 | New Zealand | –0.023 | –0.023 |
| Portugal | 0.285 | 0.285 | United States | 0.066 | 0.066 |

[a] Tax subsidies are calculated as 1 minus the B-index. Algebraically, the B-index is equal to the after-tax cost of an expenditure of USD 1 on R&D divided by one minus the corporate income tax rate. The after-tax cost is the net cost of investing in R&D, taking into account all the available tax incentives.

$$B\text{–}index = \frac{(1 - A)}{(1 - \tau)}$$

where A = the net present discounted value of depreciation allowances, tax credits and special allowances on R&D assets; and $\tau$ = the statutory corporate income tax rate (CITR). In a country with full write-off of current R&D expenditure and no R&D tax incentive scheme, A = $\tau$, and consequently B = 1. The more favourable a country's tax treatment of R&D, the lower its B-index.

The B-index is a unique tool for comparing the generosity of the tax treatment of R&D in different countries. However, its computation requires some simplifying assumptions. It should therefore be examined together with a set of other relevant policy indicators. Furthermore, its "synthetic" nature does not allow for distinguishing the relative importance of the various policy tools it takes into account (e.g., depreciation allowances, special R&D allowances, tax credit, CITR). B-indexes have been calculated under the assumption that the "representative firm" is taxable, so that it may enjoy the full benefit of the tax allowance or credit. For incremental tax credits, calculation of the B-index implicitly assumes that R&D investment is fully eligible for the credit and does not exceed the ceiling if there is one. Some detailed features of R&D tax schemes (e.g., refunding, carry-back and carry-forward of unused tax credit or flow-through mechanisms) are therefore not taken into account.

The effective impact of the R&D tax allowance or credit on the after-tax cost of R&D is influenced by the level of the CITR. An increase in the CITR reduces the B-index only in those countries with the most generous R&D tax treatment. If tax credits are taxable, the effect of the CITR on the B-index depends only on the level of the depreciation allowance. If the latter is over 100% for the total R&D expenditure, an increase in the CITR will reduce the B-index. For countries with less generous R&D tax treatment, the B-index is positively related to the CITR.

See Warda (2001) for country reviews of policy instruments.

Sources: OECD (2007), Warda (2001).

Japan and the US (EEAG 2008). With regard to tax treatment Spain and Canada offer the greatest incentive for companies to invest in research.

SMEs tend to be more flexible and inventive and, therefore, are of particular importance for innovation and research in the economy. Only a few countries, however, in their policy of R&D tax subsidies, treat SMEs and large companies differently (Netherlands, Poland, United Kingdom, Norway, Canada, Japan, and Korea). With the exception of Korea, all countries grant higher tax subsidies to SMEs than to large companies. The Netherlands and Canada display the greatest distinction. In the Netherlands one additional unit of R&D expenditure will result in a 0.173 unit greater tax relief for SMEs than for large companies. Interestingly, large companies in Korea gain a slightly bigger tax relief for 1 unit of R&D expenditure (0.022) than SMEs. One potential explanation is that huge business conglomerates, so-called chaebols, play an important role in Korea and often receive government assistance.

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**References**

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