

## Tax Support for R&D and Intellectual Property: Time for Some Bold Moves

July 19, 2022

[See E-Brief](#)

### Online Appendix

#### Benefit-Cost Analysis of SR&ED Investment Tax Credits – An Overview <sup>1</sup>

When firms perform R&D, they create knowledge that allows them to introduce new or improved products and production processes. However, some of the knowledge created unintentionally leaks out or spills over to other firms, allowing them to reap benefits from R&D without performing it themselves. On the other hand, when firms bring new products to market and develop new production processes, the increase in sales can be at the expense of other firms. This output loss represents a social cost that has to be balanced against the gain from knowledge spillovers. The empirical evidence indicates that the positive knowledge spillovers are larger than the negative “business stealing” effect.

Since firms rightly do not take the positive spillover benefits into consideration when making investment decisions, there is a *prima facie* case for subsidizing business investment in R&D to correct this market failure. However, the social costs as well as the benefits of subsidizing R&D must be considered to ensure intervening in the market improves economic performance. Abstracting from spillover benefits, overriding the market distribution of the labour and capital used to perform R&D with a subsidy is assumed to reduce economic efficiency. A loss occurs because if markets are functioning properly, capital and labour are being used as efficiently as possible prior to the subsidy-induced shift in resources.

The loss in efficiency can be illustrated by considering how the subsidy affects the commercial rate of return on the additional R&D performed. The subsidy lowers the hurdle rate for a profitable investment, so firms undertake R&D projects with less anticipated commercial value, which reduces the market value of their output. Firms performing the R&D receive their required return on investment, but part of the return comes from the subsidy.

Raising taxes, or cutting spending, to finance an R&D subsidy does not directly affect the overall income of Canadians if all the subsidy remains in the country. In other words, the first round effect on national income of increasing taxes on one group of Canadians and giving the proceeds to another is approximately zero. However, some of the R&D subsidy will be transferred to foreigners, which reduces income in Canada. This transfer occurs in part because some of the profits derived from subsidized investment in R&D accrue to foreign-owned firms. In addition, some of the subsidy will be passed on to the consumers of the products developed from the subsidized R&D in the form of lower prices. If these products are exported, some of the subsidy will be transferred to foreigners.

Finally, expenses incurred by governments to administer the credits and by firms to apply for and comply with their eligibility requirements represent a social cost. Resources devoted to these activities could have been used productively elsewhere.

Governments can in principle set the subsidy rate to maximize its net benefit. This possibility arises because increases in the subsidy rate generate benefits that are a constant share of the additional R&D induced by the

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<sup>1</sup> This is a slightly modified version of the discussion in Lester (2020).

subsidy and costs that are a rising share of the additional R&D. Costs are a rising share of the additional R&D because increases in the subsidy rate cause the required private rate of return on R&D to fall at an accelerating pace, signalling a drop in the value of output. This relationship between benefits and costs causes the net benefit to have an inverted “U” shape: it initially rises along with the subsidy rate but eventually declines as the private return on R&D continues to fall. In the absence of other costs, the net benefit would be maximized by setting the subsidy rate equal to the spillover rate. However, other costs increase relative to the spillover benefit as the subsidy rate rises; this reduces the net benefit and the optimal subsidy rate.<sup>2</sup>

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2 The optimal subsidy rate would be higher in a co-operative setting, in which all countries set the subsidy rate equal to the global spillover rate of R&D performed in their jurisdiction and the subsidy is financed globally in proportion to the spillover benefits received.