Executive Summary

Questions about the effectiveness of government financing of business R&D are of growing importance to policy makers. As they attempt to boost business R&D expenditure and improve its contribution to innovation, policy makers seek ways of evaluating not only how much additional business R&D spending is encouraged by government support, but also how government support influences the conduct and direction of business R&D. Does it encourage firms to pursue different types of R&D, or to include more collaboration in the R&D process? Do firms develop improved R&D management capabilities that lead to enduring changes in their R&D strategy and performance? Such issues are not typically addressed in traditional evaluations, which focus on assessing the amount of additional spending on R&D that resulted from government support or the additional outputs from the R&D process. Efforts to measure explicitly changes in the ways firms conduct R&D as a result of government policy instruments – *behavioural additionality* – have remained relatively under-developed.

Work conducted by the OECD Working Party on Innovation and Technology Policy (TIP) aims to address this deficiency by exploring methodologies for measuring behavioural additionality effects of government funding of business R&D. Using a common framework and conceptual understanding, but different methodological approaches, studies were made of eleven national R&D support programmes plus the European Union's Framework programme, to evaluate their behavioural additionality effects. Most of the work focused on direct financing of business R&D; but some studies examined the effects of loans or co-operative R&D programmes. To compare results and share experiences, two workshops were organised in Manchester and Vienna in 2004 and 2005, respectively.

This document summarises the results of the project, highlighting key findings from the country studies regarding the types of behavioural effects that were induced by government funding and the methodologies for measuring them. It shows that:

- The behavioural additionality concept offers policy makers a useful vocabulary for explaining the effects of policy interventions on firms and differentiating among types of effects (*e.g.* changes in level of effort versus changes in company behaviour). Such distinctions can help in designing effective policy instruments and selecting among different approaches for financing business R&D.
- A variety of behavioural additionality effects can be induced by government funding. Several country studies (*e.g.* Finland and Japan) showed that government funding not only allowed firms to accelerate the completion of R&D projects (enabling them to introduce new products or services into the market sooner), but also encouraged them to launch projects that entailed greater technological challenges that they might otherwise have pursued.

- Government funding can encourage firms to engage in more collaboration in R&D projects. The German study indicated that existing partnerships were intensified and new ones initiated as a result of government funding. The study of the US Advanced Technology Program showed that many consortia and joint projects were formed directly as a result of government funding, and that collaboration continued beyond the participation in a government-funded project – often on a different project.
- A range of different methodologies can be used for measuring behavioural additionality, each with its own strengths and weaknesses. Surveys allow for the collection of information from a large set of firms, but must often be based on the results of more in-depth interviews that identify the range of behavioural changes that can be induced by a particular government programme and the point in business innovation processes at which government assistance is sought. Econometric techniques can further highlight relationships between participation in a government R&D programme and changes in firm behaviour. A robust approach would combine methodologies.
- Methodologies need to be adapted to different types of target firms. Work in Belgium found that government R&D support played different roles in the innovation processes of different types of firms, *e.g.* large versus small firms and R&D-intensive firms versus firms in more traditional industries.

While most of the work focused on direct financing of business R&D (often cost-shared) the studies show that behavioural additionality concepts can be extended to other types of government interventions. Norway is embedding behavioural additionality into an examination of its R&D tax incentive. Austria included behavioural additionality in the evaluation of programmes that aim to link public and private sector research. As such, there are opportunities to embed the behavioural additionality approach into a broader range of policy evaluations, including those of public research organisations. Of course, all such work must recognise that some behavioural changes will be undesirable, especially as behavioural effect need not be intentional.

Future work can help further develop the concept of behavioural additionality and the methodologies for employing it. Such work can lead to a better understanding of the ways in which government R&D support interacts with and affects the strategies of firms can ultimately lead to the improved design and implementation of innovation policy instruments.