The effects of government funded R&D on SMEs in Germany: An Input-Output-Analysis

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The function of Research and Development (R&D) on long term economic growth has been studied in the economic literature for several decades. It is now undisputed that investments in R&D contribute to competitiveness through product and process innovations and induce spillover effects between enterprises which in turn are essential for long term economic growth (Grossman/Helpman 1997).
As small and medium enterprises (SMEs) usually experience difficulties in acquiring financial means for R&D most OECD countries pursue R&D policies to better utilize the innovation and growth potential of SMEs (OECD 2010). Additionally, governments are caught between the need to maintain public spending aimed at raising the EU growth potential and the increased public debts leading to cuts in public expenditure. Thus, efficient and effective public spending in growth-enhancing areas such as R&D and innovation has become even more important (Conte et al. 2009).
In this context, the German government decided in February 2009 to increase the budget for the largest German R&D program by 900 million Euro for the years 2009 and 2010 in order to counteract the negative implications of the economic crisis. The Central Innovation Program for SMEs (ZIM) encompassed a total budget of 1.5 billion Euro for these two years, not including the required co-payment of the SMEs.
Yet, the paper developed a methodology to analyse the efficiency of the ZIM program in general and the effects of the expanded budget on employment, productivity and the social security system in Germany. Usually, studies analyzing efficiency and effectiveness of public spending for R&D aim to measure additional R&D in the business sector induced by the public funding (Cincera et al. 2009) or examine the crowding out effect of government support on privately funded R&D (David et al. 2000). In contrast, the main contribution of this study is to quantify the macroeconomic effects of public funds in the area of R&D. Using for the first time in the evaluation of a German federal support program for R&D the input-output-method the paper pursues the following objectives: (1) to quantify the effects of the induced R&D investments on the demand components of the GDP; (2) to quantify the direct and indirect production and employment effects for 2009 – 2011; (3) to assess the relief of the social security systems as a result of secured employment. The following results – among others- were derived from this innovative approach: the ZIM program has given rise to a substantial leverage effect. The initial funding by the state gave rise to R&D projects summing up to 2.8 time the amount of the initial funding. Almost two thirds of the costs for the realization of the R&D projects are brought up by the enterprises themselves. Cumulated over the years 2009 to 2011 ZIM induced an additional value added of 3.9 billion Euro. Furthermore, up to 69 500 jobs have been secured or newly created. If the public funds would not have been used for R&D projects but for the general operational activities of the funded organizations the effects of the privately and publicly activated funds would have been up to 20% smaller.

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