Value for money? New microeconometric evidence on public R&D grants in Flanders

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\textbf{A B S T R A C T}

A significant amount of money is spent on programs to stimulate innovative activities. In this paper, we review the effects of a specific government-sponsored commercial R&D program from various angles. We start by evaluating whether we find positive effects of subsidies on R&D investment and R&D employment. Then, we analyze how the observed effects of subsidies on R&D intensity and employment vary over time, vary if the firm receives also support from other sources, vary depending on how many supported projects a single firm has at the same time or vary if a firm gets support consecutively. Finally, we estimate the macroeconomic impact of these grants in terms of R&D employment. We conclude that (i) the policies are not subject to full crowding out, (ii) the treatments effects are stable over time, (iii) receiving subsidies from other sources in addition to the program under evaluation does not decrease the estimated treatment effect, and (iv) receiving grants repeatedly does not decrease the magnitude of the treatment effects either. Using a back-of-the-envelope calculation, we estimate that, on average, five R&D jobs are created (or maintained) per supported project in the Flemish economy.

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1. Introduction

The impact of subsidies on firms’ innovative behaviour has been of interest in economic literature for many years now. In line with this literature, we are interested in knowing what the effect of one specific instrument is on firms’ R&D intensity and R&D employment, namely the effect of subsidies for R&D from the Flemish government (northern part of Belgium). We employ econometric treatment effects models for estimating the treatment effect on the treated. As studies like this are nowadays more or less standard in the scholarly literature and even in policy practice, we go beyond the typical application of treatment effects models. Usually scholars estimate a treatment effect on the treated (see e.g. the survey by Cerulli, 2010), and then conclude whether a subsidy program is subject to full or partial crowding out effects. In this present study, we add a number of further tests that are of interest for policy makers in their daily decision making. The analyses presented in this paper are based on detailed discussions that the authors had with the representatives of the public agency administering the innovation policy instruments in Flanders, the “IWT Vlaanderen”. In particular, the policy makers were interested in the following questions: Knowing from earlier evaluations that the estimated treatment effects are positive (see Aerts and Czarnitzki, 2006), it has been of primary interest whether

- the estimated treatment effects vary over time;
- the receipt of subsidies from other sources on top of IWT grants reduces the effect of the local policy program;
- funding the same firm repeatedly creates an increased risk of crowding out effects;
- and whether granting multiple projects to the same recipient firm in the same time period increases the risk of (partial) crowding out.

In addition to the questions mentioned above we also show that the treatment effects remain stable across different samples of firms i.e. using

- a representative sample of firms in the Flemish economy (the “full sample”)
- a subsample of firms that at least indicated some propensity to innovate (the “sample of innovators”)

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iii. a subsample of small and medium-sized firms, as a popular sub-
scheme in Flemish innovation policy is a program foreseen for
grants distributed to small and medium-sized firms (the “KMO
program”).

As we have quite detailed information on innovation project
grants in Flanders, we are also able to conduct a back-of-the-

envelope calculation on how many R&D jobs are created in
the Flemish economy because of subsidies to the business sector.

The following section will provide an overview on the institu-
tional background and functioning of the funding agency. Section
3 reviews the existing literature and the undermining theory. In
Section 4, we present the econometric method. Section 5 provides
information on the data. Section 6 shows the econometric results
and Section 7 provides information on the macroeconomic effect
of the Flemish innovation policy on the Flemish economy. Section
8 concludes.

2. Institutional background

2.1. The IWT

The agency for Innovation by Science and Technology in Flan-
ders (“Innovatie door Wetenschap en Technologie in Vlaanderen”
(IWT)) is a governmental agency, established by the Flemish Gov-
ernment in 1991. It was established to give shape to the new
competences in science and technology that were transferred from
the federal to the regional governments in Belgium. Since this
transfer of competences made of innovation policies a regional
matter, the IWT has been created as the key organization for sup-
port and promotion of R&D and innovation in Flanders. In addition
to offering Flemish companies and research centres financial sup-
port, advice and a network of potential partners in Flanders and
abroad, it also supports the Flemish Government in defining and
adapting its innovation policy.

The total funding of the IWT amounted to € 297 million in
2008. The scope of existing funding programs is quite broad,
including industrial R&D projects, EUREKA-projects, feasibility
studies and innovation projects for SME’s, support to industrial
networks (sectoral research, technological advisory services, inno-
vation stimulation), support to universities for strategic basic
research (SBO), support to higher education engineering schools
for technology diffusion actions, individual grants for PhD and
post-doc research, support to universities for exploitation of their
R&D-results and to larger “ad hoc” initiatives as decided by the
Flemish government.

In its competence of also coordinating regional innovation ini-
tiatives such as regional development agencies, technological
advisory services, sectoral research centres and industrial federa-
tions, the IWT can be viewed as both, a program owner (in close
co-operation with the Flemish Minister of Innovation) and a pro-
gram manager (selection and follow-up of research and innovation
projects).

2.2. Funding by the IWT

IWT’s funds for supporting R&D and innovation are directed
to small as well as to large companies, universities, third level
education institutions and other Flemish innovative organiza-
tions, individually or collectively. A wide range of activities is
supported through this financial support, including feasibility stud-
ies, research and development projects for companies, strategic

basic research and grants for research institutions and researchers,

network projects and translation research for intermediary organi-
zations.

Every year, some 600 companies benefit from IWT support
(overall support, all measures cumulated). While in the past it
was mainly manufacturing companies that have solicited the support
of the IWT, nowadays, service providers are more and more repre-

dented.

In order to encourage smaller firms to perform R&D, a special
program for SMEs has been put in place (the “KMO programma”).
The maximum project cost a firm can submit under this program is
€ 200,000. Of these total project costs, the maximum subsidy rate is
of 35% for a medium-sized company, and an extra 10% (hence 45% of
the total project costs) for a small-sized company. If an SME collab-
orates with a public research institute or an international partner,
it can submit a proposal of a maximum of € 250,000. If it collabor-
orates with another firm (nationally), it can get 10% top-up in the
subsidy rate.

Besides the KMO program, the IWT has the R&D program. In
the latter, the basic subsidy rate that is of 15% for development
and 40% for research. Furthermore, additional 10% are available
for medium-sized enterprises and 20% additional support for small
firms. Further support may be granted to projects that meet specif-

ic policy targets, like e.g. the promotion of sustainable technological
development or cooperation with research institution. Finally, an
extra 10% of support may be granted to projects involving substan-
tial collaboration of several companies, provided that at least one
is an SME or that the project entails an international cooperation.
The general feature of the IWT subsidy scheme is its bottom-up
character: it is a permanently open and non-thematic scheme.

With regards to the evaluation procedures, the IWT has a
well-developed set of procedures for project evaluation, based on
internal and external referees to evaluate the ex-ante effectiveness
of the project proposals.

Initially, the evaluation criteria were heavily focussed on the
scientific qualities and technological risks of the project. Gradually
however, the economic dimension became equally – or even more
– important, reflecting the shift from a purely R&D policy towards
a more innovation related policy focus. This economic evaluation
doesn’t only concern the financial feasibility of the project or the
commercial prospects for the innovating firm but also the economic
return for Flanders.

As part of the IWT’s evaluation, other ‘societal’ qualities of the
project – mainly concerning environmental sustainable develop-
ment – are also considered, though to a lesser extent than the
economic criteria. The evaluation gives access to extra support in
the form of a priority ranking across existing subsidy schemes and
of a financial bonus of 10% on the project budget. Hence, project
evaluation in Flanders is closely linked to general policy criteria in
a bottom-up innovation policy design.

3. Theoretical premises and literature review

3.1. Theory

In economic literature, the impact of innovation policies –
and particularly direct subsidies for R&D – on firms’ innovative
behaviour has been of interest for many years now. The economic
justification for governmental intervention for private sector R&D
activities relies on the familiar market failure arguments (Arrow,
1962). Given these market failure arguments, most governments
in industrialized economies attempt to correct them by design-
ing policies, like for instance intellectual property right systems
to improve appropriability of knowledge, tax reliefs to reduce the cost
of R&D (see Hall and Van Reenen, 2000), direct subsidy programs

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