The effects of public support schemes on small and medium enterprises

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ABSTRACT

In this paper we will investigate the effects of direct grants and tax incentives on recipient small and medium enterprises (SMEs). Direct grants and tax incentives are two different public instruments used to correct market failure and facilitate innovation through lowering the cost of R&D. Although large and small firms innovate in different ways, so far limited empirical evidence has been reported with respect to the effectiveness of public R&D instruments for SMEs. Our data suggests that direct subsidies used alone or with tax incentives strengthen the R&D orientation of the SME as well as some aspects of innovation output and absorptive capacity. Although the effects of policy measures are significant when comparison is made to firms that did not use any of the two instruments, not much difference is found when users of direct grants are compared to those who used both the grants and the tax incentives. This result indicates the existence of limitations in the use of tax incentives by SMEs, and thus suggests that subsidies may be the primary instrument in SMEs.

1. Introduction

In this paper we investigate the effects of direct grants and tax incentives, two different public instruments used to correct market failure and facilitate innovation. (The terms direct grant and direct subsidy are used interchangeably to denote a payment made usually by government agencies or local authorities to companies in order to subsidize the cost of a specific R&D or innovation project). While direct subsidy programs are generally intended to support commercial R&D projects with large expected social benefits but inadequate expected returns for private investors (Klette et al., 2000), a tax incentive is a tool for encouraging private R&D expenditure in companies. Traditionally, the majority of studies have focused on determining the impact of public instruments on R&D expenditures. As it was recognized that this aspect by itself does not sufficiently explain the effect of public instruments on innovation in firms, the focus shifted to include the impact of public instruments on innovation output, and changes in firms' innovation-related behavior (Clarysse et al., 2009). However, studies that deal with alterations in firms' innovation output and behavior remain scarce.

Existing literature presents evidence of the usefulness of both tax incentives and direct grants, but the overwhelming majority of these studies focus on only a single instrument as opposed to both. Studies that consider the joint use of these instruments are very scarce (Busom et al., 2014; Bérubé and Mohnen, 2009). The effectiveness of these public policy measures is of particular relevance for small and medium enterprises (SMEs), which rely on innovation to an even greater extent than large firms and are less able to appropriate rents associated with innovation (Fritz, 1989; Sweeney, 1983). This paper adopts the European Commission definition of SME as a company that employs less than 250 employees and has a turnover of less than 50 million Euros. Taking into account that SMEs comprise a large part of most economies, it is fair to state that the impact of public instruments on SMEs requires special consideration.

In this paper we seek to contribute to the literature on public support schemes in four ways. First, we focus purely on SMEs seeking to contribute to the understanding of how public instruments affect these companies. We also consider the effects of subsidies (alone or used jointly in combination with tax incentives) on a number of R&D and innovation variables compared to firms which underwent no treatment. Thus far not much empirical evidence has been provided with respect to the effectiveness of R&D instruments on small and medium-sized firms (Romero-Jordán et al., 2014; Czarnitzki and Lopes-Bento, 2013; Reinkowski et al., 2010; Herrera et al., 2010). The closest to our paper is the study by Hottenrott and Lopes-Bento (2014), which demonstrates that R&D subsidies aimed at incentivizing collaboration in SMEs improve innovation performance. As compared to Hottenrott and

Lopes-Bento (2014), in our paper we examine the effects of R&D subsidies used alone or with tax incentives on innovation output. Additionally, we include more output variables such as the number of employees in R&D, R&D intensity, the number of innovations as well as the percentage they represent in sales, and the effects of public instruments on absorptive capacity.

Second, since large and small firms innovate in different ways, the same policy may affect large firms and SMEs differently. Due to the specific features of each instrument, in SMEs direct grants can be expected to be favored over tax incentives. For example, Busom et al. (2014) show that financially constrained SMEs prefer subsidies over tax incentives, and suggest that tax incentives may not be effective in resolving appropriability concerns in SMEs. Based on these findings we hypothesize that in SMEs subsidies may be a primary policy instrument, while tax incentives serve more as a fill-in to cover less demanding projects. To confirm this hypothesis, we compare the use of subsidies alone with the joint use of subsidies and tax incentives, and examine to what extent the addition of tax incentives contributes to R&D, innovation output and absorptive capacity.

The third contribution we attempt to make in this paper is to show that the effects of public instruments affect the recipient firm on a deep level by affecting crucial firm capabilities such as absorptive capacity. Any firm can be viewed as a bundle of tangible and intangible resources and capabilities (Wernerfelt, 1984; Eisenhardt and Schoonhoven, 1996), where resources can be defined as financial, physical, human, commercial, technological, and organizational assets used by the firm, and capabilities refer to the firm's capacity to deploy and coordinate different resources (Grant, 1996; Amit and Schoemaker 1993). In this paper we focus on absorptive capacity which is one of the most important firm capabilities; it is defined as a firm's ability to recognize the value of new information, assimilate it, and apply it for commercial purposes (Cohen and Levinthal, 1990). Absorptive capacity influences the creation of other organizational competencies and provides the firm with multiple sources of competitive advantage (Barney, 1991). This capacity is developed cumulatively: it depends on the level of prior knowledge and is advanced through a process of knowledge accumulation which happens through various activities, most notably R&D. Its importance lies in its direct positive impact on future innovation performance and competitiveness (Kostopoulos et al., 2011). By enabling SMEs to engage in R&D and innovation (which may not be possible without public assistance), public instruments enable knowledge accumulation, which in turn augments absorptive capacity and improves future performance.

Lastly, the data for this study was collected in Croatia, a developing economy. Studies examining the effects of R&D policies have focused mostly on developed economies while similar studies for developing countries are very scarce (Ozcelik and Taymaz, 2008). Our paper seeks to contribute to the filling of that gap.

This paper is organized as follows: section two presents the institutional background; section three contains the literature review; section four develops the hypotheses; section five introduces the methodology; section six elaborates on the data used in this paper; section seven presents the data analysis and results; section eight discusses the results and section nine concludes the paper.

2. Institutional background

Croatia has gone through an intense period of political, economic and social transition, and the system of R&D and innovation support has since been changing accordingly and adjusting to EU guidelines. The Government has always been the main investor in science and R&D, with the private sector contributing only about one third of the funds. Research and development have mainly been supported by tax incentives and subsidies.

Subsidies for R&D and innovation are provided through several institutions. One of these is the Business Innovation Center of Croatia or BICRO, which was founded by the Croatian Government in 1998 in order to implement technological development and innovation support programs. BICRO offers competitive matching grants aimed at SMEs. Other subsidy programs are provided through the Ministry of Economy, and the Croatian Agency for SMEs (HAMAG) which targets SMEs specifically. The funding conditions vary from program to program, but mostly funding takes place through matching grants. Innovation subsidy programs do not make any exclusion on eligibility based on the industrial sector; funding is based on the quality and creativity of the proposed industry projects.

Tax incentives for R&D were introduced into the Croatian tax system in 2003. They may be awarded for categories of fundamental research, industrial and development research, technical feasibility studies, and innovation. Enterprises are allowed to lower their profit tax base by 150 percent of the eligible cost for fundamental research, 125 percent of the eligible cost for industrial research, and 100 percent of the eligible cost for development research. The total amount of the aid awarded, based on all the possible grounds, cannot, however, be higher than 100 percent of the eligible cost for fundamental research, 50 percent of eligible cost for industrial research and 25 percent for development research. In the case of small enterprises these percentage points for industrial and development research can be increased by 20 percentage points, and in the case of medium-sized enterprises by 10 percentage points.

The goals of both subsidies and tax incentives can be summed up as increasing the competitiveness of the Croatian industry through enabling innovation. The policy makers do not have specific strategic goals that they wish to realize with these instruments, such as facilitating innovativeness in certain industries. This is most

Table 1
State aid for research and development and innovation in the period 2004–2009.
Source: Croatian Competition Agency, Annual Reports on state aid for years 2006, 2007, 2008, 2009.

	2004 In mil. EUR	2005 In mil. EUR	2006 In mil. EUR	2007 In mil. EUR	2008 In mil. EUR	2009 In mil. EUR
Grants	0.0	0.6	2.4	0.7	6.5	4.3
Tax advantages	16.5	16.8	16.6	21.3	22.5	14.6
Total	16.5	17.5	19.0	21.9	29.0	19.0
As % in horizontal aid	10.8	14.0	12.9	24.1	31.6	21.1
As % in total state aid (less agriculture and fisheries)	3.7	4.0	2.3	2.0	3.5	2.8
As % of total state aid	2.4	2.5	1.6	1.4	2.2	1.6
As % of GDP	0.06	0.06	0.06	0.05	0.06	0.04