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R&D grants and R&D tax credits to foreign-owned subsidiaries: Does supporting Multinational Enterprises' R&D pay off in terms of firm performance improvements for the host economy?

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Synopsis

The subsidiaries of foreign-owned multinational firms make substantial contributions to national Research and Development (R&D) in many host economies. It is common for policymakers in host economies to support subsidiaries' R&D efforts, by means of R&D grants and R&D tax credits. A key goal of this funding, is to leverage R&D-driven firm performance benefits for the host country. However, the subsidiary's parent firm may decide not to commercially exploit the results from host economy funded R&D projects, in the host economy. Therefore, supporting subsidiaries' R&D presents a unique risk, that large amounts of public R&D funding may translate into little, or no firm performance payoffs for the host country.

To examine the above issues, we construct a novel panel dataset, comprising over 24,000 observations of firms in Ireland over a 10-year period. Using this rich data, we begin by evaluating the impact of R&D grants and R&D tax credits on subsidiaries' R&D. We then proceed to examine the link between policy-induced R&D from each policy instrument, and subsidiaries' firm performance in the host economy. Our study provides the first evaluation of 1) whether public R&D funding leads to additional R&D investment in subsidiaries, 2) whether policy-induced R&D drives subsidiaries' firm performance in the host economy, and 3) the differential impacts of both R&D instrument types. We find that both R&D grants and R&D tax credits drive subsidiary R&D, and that the policy-induced R&D brings about significant host country improvements in turnover, exports, and value added.

Introduction and Background

Policymakers frequently undertake an industrial policy approach of incentivising foreign-owned subsidiaries to increase their R&D activities. This is commonly achieved either through direct grants or tax incentives, in anticipation of realising economic benefits (OECD, 2015). Our study provides, to the best of our knowledge, the first evaluation of whether R&D grants and R&D tax credits drive additional R&D investment in foreign-owned subsidiaries, and whether this publicly-funded R&D, results in firm performance improvements for the host country. Foreign-owned firms may use R&D support from the host country, but commercialise host country-funded R&D results at other locations in their global R&D networks. By analysing the impact of public R&D funding on foreign-owned subsidiaries, we provide novel insights on this pertinent policy issue.

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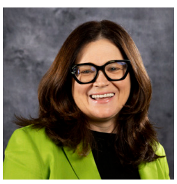
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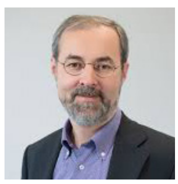
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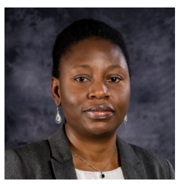
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A challenging conundrum exists for host economy policymakers. On the one hand, allocating public R&D funding to foreign-owned subsidiaries offers a unique opportunity for host economies to leverage R&D-driven firm performance benefits for the domestic economy. On the other hand, subsidiaries may transfer the knowledge produced by government-funded R&D to other locations, and not commercialise R&D results in the host economy. This presents a potential risk, that substantial amounts of scarce public R&D funding will translate into little, or no firm performance payoffs in the host country.

Issues and Questions Considered

The current study makes two distinct contributions to the literature on public funding for R&D. Firstly, to the best of our knowledge, ours is the first to examine the above issues, employing detailed firm-level panel data. Most earlier studies have been partial in nature, relying primarily on small, cross-sectional datasets, with sparse information on R&D support instruments, and firms' R&D and performance outcomes.

Our study's second contribution concerns the differential impacts of R&D grants and R&D tax credits in foreign-owned subsidiaries. Despite some recent research having examined both policy instruments in the general population of firms (e.g. Dumont, 2017; Nilsen et al., 2020), their relative effectiveness in foreign-owned subsidiaries is wholly absent heretofore.

The two main public support instruments, R&D grants and R&D tax credits, influence firms' R&D through different mechanisms (Hall and Van Reenen, 2000). R&D tax credits are deductions from a firm's corporation tax, which lower the marginal cost of R&D (Rao, 2016). R&D grants on the other hand, are mostly allocated to firms for specific R&D projects that are prioritised by funding agencies (David et al., 2000). By providing direct support, R&D grants raise the marginal rate of return on R&D.

We analyse the impact of public R&D support, by comparing foreign-owned subsidiaries that received public R&D support, relative to similar foreign-owned subsidiaries that did not receive public R&D support. This is important because Multinational Enterprise subsidiaries have several unique characteristics which may result in distinct effects of policy intervention.

Methodology

We examine the impact of public R&D funding on subsidiaries' firm performance using a two-stage method. First, we use Propensity Score Matching to estimate the additional policy-induced R&D that can be ascribed to R&D grants and R&D tax credits. Second, we apply a fixed effects panel model to estimate the effect of the policy-induced R&D from both instruments, on subsidiaries' turnover, exports, and value added.

We take account of the duality in the Irish economy between foreign-owned subsidiaries and Irish-owned firms, by splitting our dataset into: (a) Foreign-owned subsidiaries based in Ireland; and (b) Domestically-owned firms. We perform the two-stage estimation procedure separately for each sample. In the domestic sample, the risk associated with funding subsidiaries is not likely to occur. As such, the pattern of results which emerges from the domestic firms' sample is key to accurately interpreting our results for foreign-owned subsidiaries.

Our empirical analysis constructs a unique dataset, comprising the Irish Annual Business Survey of Economic Impact (ABSEI), as well as administrative data on R&D grants and R&D tax credits awarded to firms between 2007 and 2016. By constructing this novel dataset, we overcome many data limitations faced by previous studies.

Outcomes and Findings

Our study makes two crucial contributions to the literature on public support for firm-level R&D. First, we explore the unique risk that foreign-owned firms may conduct publicly-funded R&D in a host country, but not exploit the R&D results in their host country. Our results indicate that, at least to a sufficient extent, this key risk does not occur. Both R&D grants and R&D tax credits are effective at driving subsidiaries' R&D. Moreover, this policy-induced R&D translates, on average, into higher subsidiary firm performance. In addition, the effectiveness of policy-induced R&D is statistically equivalent to that of purely privately-financed R&D. This suggests that public R&D support plays an equally significant role in driving foreign-owned subsidiaries' performance, as private R&D does. Second, we assess the comparative impacts of R&D grants and R&D tax credits. Our results indicate that both R&D grants and R&D tax credits, generate a similar impact on foreign-owned subsidiaries' R&D, which is significantly related to firm performance improvements.

From a policy perspective, our study contributes to the debate on R&D Foreign Direct Investment (FDI) policy, and the R&D grants versus R&D tax credits debate more generally. We find higher additionality for R&D grants (relative to R&D tax credits) in the case of foreign-owned subsidiaries, and higher additionality for R&D tax credits (relative to R&D grants) in the case of domestic firms. In addition to providing key insights for other small open economies pursuing an FDI-focused development strategy, our findings may be relevant for countries beyond the Irish case. Hence, our study represents an important advancement in the literature on public R&D funding targeted at firms.

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