

Which role plays ICT investment on the R&D outsourcing strategy? Evidence from Luxembourg firms

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Abstract

Today, firms face a changing environment due to rapid advance of globalization, emergence of new competitors and diversification of demand. In this context, firms' innovative capabilities depend not only on firms' internal competencies but also on their capacity to develop other organizational strategy for managing their innovation activities. Among different forms of organization of Research and Development (R&D) such as alliances, partnerships or sub-contracting, outsourcing appears to be increasingly adopted by firms as a way to maintain or increase their competitive advantage (Cassiman and Veugelers, 2006; Ulset, 1996; Quinn, 2000). Moreover, the rapid growth of information and communication technologies (ICT) in the last decade favours the compatibility and tradability of many services and knowledge across the world (Goodman and Steadman, 2002; Abramovsky, Griffith and Sako, 2004; Abramovsky and Griffith, 2006). This extraordinary development of ICT could increase benefits from R&D activities outsourcing.

Theoretical studies on outsourcing are in general presented from two perspectives: transaction costs and strategic management. Following the first viewpoint, ICT can be considered as a tool to reduce transaction and adjustment costs of moving activities outside the firm and thus will beyond favour the outsourcing phenomenon. The ICT could change the optimal structure of the organization and thus allow firms to be flexible and adaptative (Bresnahan, Brynjolfsson and Hitt, 2002). According to the strategic management one, including the resource-based view, outsourcing allows firm to access to complementary or new competencies while concentrate in developing their specific internal ones (Kogut 1988, Kogut and Zander 1993; Penrose, 1959; Nelson and Winter, 1982).

Previous empirical studies have focused mainly on the outsourcing of materials (Antras and Helpman, 2004; Hubbard and Baker, 2003). Surprisingly, little has been said on other types of organizational forms such as make or buy the business services or the R&D activities. These types of outsourcing are, however, increasingly adopted by firms and have moved to the top of the innovation policy agenda over recent times.

The purpose of this paper is to assess the importance of ICT investment on the firms' strategy concerning their R&D activities and its impact on the innovation process from the viewpoints of transaction costs and strategic management. Our research objectives are thus twofold. First, we wonder to know whether ICT investment influences firms' choice to buy R&D activities instead of making those themselves. Second, following the research stream of numerous previous studies (Heshmati, 2003; Holger, Hanley and Strobl, 2008; Ohnemus, 2007), we wonder to understand in what extend this make or buy strategy affects the firms' success across the innovation process. In order to do that, we differentiate two phases of the innovation process: the probability to innovate and

the intensity of innovation conditional on doing any innovation at all (measured as the percentage in sales of innovative products).

For this purpose, we conduct our analysis using two large and nationally representative datasets of Luxembourg manufacturing and services firms, collected by the CEPS/INSTEAD. The first dataset is drawn from the "Community Innovation Survey" (CIS2006) carried out in 2008 for the period 2004 and 2006. The second firm-level dataset is taken from the annual "ICT Usage and e-Commerce in Enterprises Survey" realized in 2004, 2005 and 2006.

In this paper, we would like to assess the impact of ICT investment on the firms' decision to outsource their R&D activities and the role of this strategy on the firms' performance. In line with the viewpoints of transaction costs and strategic management, a positive relation between R&D outsourcing and ICT investment should be expected. Among other potential factors that may influence this choice, one can expect the impact of industrial and firms' characteristics such as sector of activities or firms' size, in line with previous empirical results in the literature. Moreover, other factors such as competition intensity, obstacles to innovation or incoming spillovers etc., are introduced in the study in order to capture potential influence of firms' economic environment.

Keywords: Research and Development, Information and Communication Technologies adoption, Outsourcing, Performance, Innovation process