



# Product innovation and the decision to invest in fixed capital assets: Evidence from an SME survey in six European Union member states

Dimitris Skuras\*, Kyriaki Tseggenidi, Kostas Tsekouras

Department of Economics, University of Patras, Greece

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## ABSTRACT

This work explores the relationship between product innovation and the decision to invest in fixed capital assets among a sample of SMEs in six European Union countries located in both peripheral and more central areas. We find that the presence of product innovation reduces the probability to invest. A firm's size exerts a direct, inverted U-shape effect on the probability to invest and an indirect effect through the linear effect of size on the probability to innovate. The gap in the probability to invest between innovative and non-innovative firms increases with size.

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## 1. Introduction

The existence and operation of SMEs are of paramount importance for the European economy. This is due to two reasons. First, micro enterprises (firms with less than 10 employees) and all SMEs (firms from 1 to 250 employees) account for 92% and for more than 99%, respectively, of all businesses in Europe (European Commission, 2003). Unlike in the US, SMEs in Europe have a very high share of total employment. Second, SMEs create an entrepreneurial economy as opposed to a managed economy and contribute to increased knowledge, competition and variety (Audretsch and Thurik, 2001; European Commission, 2003). The Commission of the European Union has recognized the importance of SMEs to the competitiveness of the European economy and the need to support innovation among SMEs. Thus, the Commission launched the Competitiveness and Innovation Framework Programme (CIP) that runs from 2007 to 2013 and is divided

into three operational programmes. The Entrepreneurship and Innovation Programme (EIP) is one of the three CIP operational programmes, with an overall budget of 2.17 billion euro.

Innovative activities compete with other activities for a firm's financial and human resources. Financial constraints emerge as the prime barrier to innovation in many recent business surveys carried out among European firms. The Observatory of European SMEs most recent survey (Flash Eurobarometer, 2007) revealed that almost 37% of SMEs do not report any turnover from innovative products. The managers of these businesses argue that problematic access to finance, scarcity of skilled labour, and expensive human resources are three of the top four barriers to innovation, the fourth being inadequate market demand. It is also important to note that almost half of the managers of non-innovative enterprises (16% of all respondents) are troubled by high interest rates and other problems with access to finance. Finding or mobilizing financial resources is also one of the top four unsatisfied needs of innovative large companies and SMEs alike (Flash Eurobarometer, 2004). In the same survey, 90% of innovative firms state that a part of their overall investments is channelled into innovation, 47% dedicate up to 10% of

\* Corresponding author at: Department of Economics, University of Patras, University Campus – Rio, P.O. Box 1391, Patras 26504, Greece.

E-mail address: [Skuras@econ.upatras.gr](mailto:Skuras@econ.upatras.gr) (D. Skuras).

their overall investments to innovation, while big innovation investors (investments in innovation accounting for more than 51% of total investments) were 14% of total innovative businesses. The empirical evidence presented above suggests that firstly, innovative activity (product or process) demands investments, and secondly, innovative and non-innovative firms alike find access to financial resources to be an important barrier to innovation.

Economic theory has highlighted the important role of innovation and investments for the growth of regions and countries. Innovation and investments that enable businesses to be 'blazing new trails' are crucial for business success while, without innovation, automatic decline is inevitable (Schumpeter, 1951). For an individual firm's performance, product innovation is considered to be among the dynamic capabilities of a firm, since it can either strengthen the firms' competencies by allowing the firm to exploit its capacities, or it can be used by the firm to explore new fields which currently are outside its capabilities (Malerba and Orsenigo, 1993; Teece and Pisano, 1994). Investment in fixed capital, on the other hand, expands a firm's capacity and strengthens its position against rivalries (Dixit and Pindyck, 1994). Apparently, both investment and innovation thus contribute to firms' performance. Notwithstanding the remarkable research concerning the relationships between human capital and R&D expenditures as an input to innovative activity (Leiponen, 2005; Mohnen and Röller, 2005), surprisingly little research has hitherto been conducted on the relationship between innovation and the decision to invest in fixed capital assets.

Our contribution aims to bridge this research gap. In particular, we examine whether innovative activity is complementary or competitive to the decision to invest in fixed capital assets, among a sample of over 500 SMEs located in six European Union member states. Thus, the research question of the present work addresses issues at the heart of the strategy launched by the European Council in Lisbon in March 2000. In the case of complementarities between innovative activity and the decision to invest in fixed assets, innovation may lead to an increase in the demand for a firm's product, which may result in the firm's expansion in terms of employment and fixed capital. Smolny (2003) argues that there are complementarities between innovations and capital investments, without assuming a causal relation. For example, a new product requires a new production process and a new production process allows the production of a new good. Thus, he argues, "the probability to implement an innovation depends positively on the amount of investment and the amount of investment depends positively on the implementation of innovations". Smolny (2003) findings show that "firms that implemented a product innovation only, invested even less than firms that did not innovate". In the second case, when innovation and the decision to invest in fixed capital assets are competitive, innovation is not followed by an increase in fixed capital assets. Economic actors know that there exists a kind of opportunity and they use resources to explore new products or processes (Dosi, 1988; Oerlemans and Meeus, 2005), and thus drain a firm of capital that could otherwise have supported investments in fixed assets. Most frequently, investments in fixed assets support a managed economy

dictated by the forces of large-scale production, reflecting the predominance of the production factors of capital and (unskilled) labour as the sources of competitive advantage. Innovative activity underlines an entrepreneurial economy dominated by the production factor of knowledge. Thus, a possible competitive relation between innovation and fixed assets investments may be reduced to the operation of counterbalancing forces between the managed and entrepreneurial mode within SMEs in the same economy.

Firm size exercises an important, and frequently contradictory, effect on innovative activity and fixed asset growth. For this reason, we extend our analysis beyond the mere exploration of the relationship between innovation and the decision to invest in fixed assets. We also examine the simultaneous effects that a firm's size exercises on innovation and the decision to invest in fixed assets.

The paper is developed in four further sections. The theoretical framework underlying the relationship between innovative activity and investments in fixed assets is presented in Section 2. The case study areas and the methodology are presented in Section 3. The major results from our case study areas are presented in Section 4, while a discussion regarding the findings and shortcomings of our work follows in Section 5 where we also explore the importance of our findings for public economic policy.

## 2. Innovation and the decision to invest in fixed assets: a puzzling relation

The most frequently mentioned synthesis of definitions of innovation (e.g. Pavitt et al., 1987; Neely and Hii, 1998) is the one cited by OECD (1981) where innovation "consists of all those scientific, technical, commercial and financial steps necessary for the successful development and marketing of new or improved manufactured products, the commercial use of new or improved processes or equipment or an introduction of a new approach to a social service. R&D is only one of these steps". Innovation may be 'radical', i.e. innovation involving new developments within a sector or economy, 'adaptive', i.e. innovation concerning new changes to an individual firm but which other firms may have already adopted, or 'incremental', i.e. innovation involving modifications of existing products and services (Neely and Hii, 1998).

As stated in Section 1, innovation may have either a positive or a negative impact on the decision to invest in fixed assets depending on whether innovative activities are competitive or complementary to the activities related to the stock of fixed assets. Furthermore, one should consider that the decision-making processes leading to innovation and to investments, besides their impact on each other (negative–positive), may or may not be correlated, i.e. jointly determined, allowing or not for interactions between the two processes. They may be correlated through a Schumpeterian competition paradigm which implies that the innovative characteristics are frequently embodied in new capital equipment. They may not be correlated through the argument that rational economic and business behaviour ensures that the introduction of an innovation has characteristics that discourage investment

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