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Tesi di dottorato in **Five dimensions of innovation: studying technological strategies through patent data**

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Abstract

Technological innovation is the key driver for technological progress and firms' economic growth. Since firms pursue different innovation approaches, they achieve different innovation performances. Actually, a firm's ability to develop technologies and products is strongly conditioned by its stock of knowledge, expertise and technology from prior R&D. The R&D conducted by companies is an investment activity whose output is the firm's knowledge stock. This asset positively contributes to the firms' future financial performance and, then, to its market value. The higher the level of innovativeness of the invention, the higher the expected technological and financial impact. As a matter of fact, some new technologies can be considered as an extension of previous innovations, whilst others are breakthrough, discontinuous or disruptive. Analysing technological innovation requires objective and standardized data, thus scholars often refer to patents. Actually, patents are a direct outcome of the inventive process, and more specifically of those inventions that are expected to have a commercial impact; furthermore, they capture the proprietary and competitive dimension of technological change. Since obtaining patent protection is costly and time-consuming, only inventions that are expected to provide benefits that outweigh cost are applied. Patents have been treated as the most important output indicators of innovative activities and patent data have become the focus of many tools and techniques to measure innovation. Among the information available in such documents, technology classification, assignee field, citations and patent families are used to define different innovation metrics.

The aim of this thesis is to investigate which strategical, technical and organizational issues affect innovative processes, their outputs and the quality of such innovation outputs. Actually, despite technological strategies implemented by innovative firms are widely

investigated in literature, most attention has been devoted to only one dimension of R&D processes at time. Since innovation processes are featured by extreme complexity, I suggest a multidimensional approach, which provides a more complete overview of such processes, proposing a practical instrument useful for both business analysts and researchers, allowing them to detect, for instance, the determinants of high quality innovations.

Hence, this work constitutes a contribution to the analysis of innovation strategies by posing the following research question: *are patent data useful to provide a complete overview of innovation processes carried out by companies?*