

## Chapter 66

# Challenges for Innovation Due to Firm Size: The Case of Brazilian Industrial Firms

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### ABSTRACT

*This chapter analyses the innovative capacity of small firms compared to medium and large firms in Brazilian industry. It presents the Schumpeterian debate regarding the role of small and large firms as inductors of innovation, including a brief discussion about the barriers and opportunities for innovation faced by small businesses, particularly in developing countries. The empirical analysis is based on the Brazilian Innovation Survey, which is used to compare the innovative efforts undertaken by small, medium and large enterprises. Its main findings are that in Brazil, large companies predominate in the creation of new products and processes, while smaller perform more effort than those in innovations associated with processes modernization. However, from the observation of the industry sectorial structure, it identifies that in high-tech sectors, Brazilian small companies outperform large in efforts in R&D.*

### INTRODUCTION

This study aims to analyze the differences in the innovative performance of small, medium and large companies in Brazilian industry. It considers that sectorial characteristics influence in these groups of firms differently. The paper raises the hypothesis that in high-technology sectors, micro and small enterprises (MSEs) aim to take part in the market through differentiation, technological niches and opportunities, while in the lower technology segments the MSEs innovative processes are limited to technical improvement of their industrial plants.

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## **Challenges for Innovation Due to Firm Size**

In Brazil, the literature about the productive and innovative performance of smaller companies is scarce, basically limited on those studies that will be mentioned in our literature review. Considering that most innovative expenditures are performed by large firms, the Brazilian studies have prioritized this group of companies. But, as it will be discussed later, based on the number of employees and number of innovative firms, smaller companies are a relevant category in Brazilian economy. So, it seems essential understand better their productive and technological performance to promote the diffusion of knowledge in the country.

The paper is composed of five sections and organized as follow. After this brief introduction, section 2 presents some of the main findings of the literature regarding innovation and firm size. Section 3 presents an overview of Brazilian industrial firms based on their innovative performance by firm size. Section 4 discusses the differences among sectors in innovative effort per firm size. Section 5 presents the main conclusions.

## **A REVIEW OF THEORETICAL AND EMPIRICAL RESEARCH**

Micro, small and medium enterprises (MSMEs) account for a significant part of employment, production and sales in several countries. In the European Union, for instance, MSMEs represent 99 percent of industry and account for more than 70 percent of employment (Nieto & Santamaria, 2010). In the newly industrialized countries (NICs), MSMEs generally employ the largest percentage of the workforce, are responsible for income generation opportunities and, at least in the case of East Asia and India, MSMEs contribute with a substantial share of the manufactured exports. In China and India, they are responsible for most part of total businesses, gross industrial output value, sales revenues and employed people (Singh *et al.*, 2009).

Although their economic and social relevance is consolidated, the role of MSMEs on innovative performance is still controversial. The ancient Schumpeterian debate over how firm size relates to the ability and propensity to innovate continues to arouse controversy today (Nieto & Santamaria, 2010).

In his initial phase - known as Schumpeter Mark I - the author argued that radical innovations would be promoted by small businesses, through the action of entrepreneurs who would break with the prevailing technological paradigms ("creative destruction"). More than the generation of innovations itself, the economic development would result of their diffusion through the environment. Afterward - as Schumpeter called on stage Mark II - the author highlighted the central role of large firms in the development of new technologies and, consequently, of economic growth, in a processes known as "creative accumulation".

As mentioned by Tether (1998), the contrasting hypotheses of Schumpeter have been widely but inconclusively examined. The existence of such a large literature is indicative of both the importance of the theme and the inconclusive nature of the results. Interpretation is especially difficult because of the different indicators used to evaluate the innovative performance, such as R&D expenditures, R&D employment, patents and others, suggesting different relationships between firm-size and innovative performance.

These differences in measuring and interpreting innovation efforts and results can be associated to the advantages traditionally ascribed to large and small firms. The main relative strengths of MSMEs lie in behavioral advantages, whereas those of large firms reside in their resource advantages. Especially in developed countries, smaller firms generally enjoy internal conditions that encourage innovativeness, such as entrepreneurship, flexibility, and rapid response. MSMEs present an increased ability to respond

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