

Extended Abstract

GROWTH OF FIRMS IN LESS DEVELOPED COUNTRIES¹

On the Influence of Innovation, Risk Aversion and Productivity

RICARDO PASCALE²
JORDI VILASECA³

Purpose

The purpose of this paper is to analyze: **1)** The determinants of the innovation dynamism in the Uruguayan industrial firms; **2)** the importance of the innovation in the Total Factor Productivity (TFP), of the Uruguayan industrial firms, and **3)** The role of Information and Communication Technologies (ICT), and the TFP in the growth of the industrial firms in less developed countries. This case is based in Uruguay during the period 2002- 2004.

Motivation

Several reasons motivated the present study. Uruguay has shown a tremendous drop in its economic performance during the last fifty years. The Uruguayan Gross Domestic Product (GDP) per capita has sharply diverted from that of the classical reference countries (Spain, Italy, France) as well as from those of New Zealand, Australia, Finland and Ireland. The population below the poverty line has increased to more than 40% of the total population. Furthermore, there are no studies of innovation, productivity and growth based on microeconomic data. Most of the existing research rests on secondary or macrovariables.

Method

The methodology of this study follows the quantitative vein and combines, at technique level, qualitative in depth interviews and discussion groups.

Data

The main quantitative data was collected from a representative sample of 252 industrial firms that represents more than two thirds of the Uruguayan Industrial Gross Domestic Product.

¹ This paper is based on the doctoral thesis of Ricardo Pascale “Economía del Conocimiento en países subdesarrollados: TIC, innovación y productividad. Un análisis de la industria manufacturera en el Uruguay”.

² University of the Republic, Uruguay.

³ Universitat Oberta de Catalunya, Spain.

Definitions

The definition of innovation used in the study is the “successful exploitation of new ideas”. The innovation was studied in products, processes, organization and commercialization.

The TFP was obtained as a Solow Residual, using the standard Growth Accounting approach.

Results: Determinants of Innovation

Logistic regression was used to analyze the determinants of innovation. The dependent variable, as a dichotomic one, was the innovation.

Four models were calculated, each one in relation to the four dimensions of innovation mentioned above.

Several potential explanatory variables were tested. According with the results of the logistic regression models calculated, two are the variables that substantially explain the dynamism of innovation in Uruguayan firms.

Those variables are:

- RISK (negative)
- ICT (positive)

The results obtained were significant, at model and variable level, in the cases of innovation in products and innovation in processes.

Less significant were the results in the cases of innovation in organization and commercialization.

The variable RISK was measured through the Arrow (1965) and Pratt (1964) Absolute Risk Aversion measure taking into consideration -in a qualitative basis- the cognitive insights by Tversky and Kahneman (1979, 1992).

The main finding of the variable RISK is the extremely severe risk aversion of the Uruguayan entrepreneur. This risk aversion has a negative influence on the innovation dynamism of Uruguayan firms. It is also important to underline that the variable RISK is practically non-existent in the models built in highly developed countries where the risk behaves in a “normal” manner.

The ICT represents knowledge and has a positive influence on innovation.

Results: Importance of Innovation in the TFP

The growth accounting approach was used to build the models of the relationship between innovation and TFP. A robust estimation with OLS regression was

employed. The variable to be explained was the rate of variation in the TFP, and the potential explanatory variables were the different dimensions of innovation which were included as dummy variables, rate of variation of the industrial sector, the technological intensity as a categorical nominal variable and the different levels of occupation as categorical ordinal variables.

The first residual obtained includes the effects of relative prices changes due to swings in the real effective exchange rate. This nominal type effect was eliminated from the substantial analysis. The fundamental results show that the innovation in processes explains an important part of the rate of variation of the TFP.

Results: A Growth Model for Uruguayan Firms

Finally, following the previous results, a model was constructed to explain the growth of industrial firms in Uruguay. The finding was that TFP is not zero, and the final model obtained was:

$$Y = A(ICT, RISK)K^{\alpha}L^{(1-\alpha)}$$

which means that the variation of the product (Y) not only depends on labor (L) or human and physical capital (K), but also on other variables. It also positively depends on the use of ICT, and negatively on the risk aversion of entrepreneurs. The variable RISK has a severe weight in the function and, therefore, in the results of growth. This negative effect cannot be -for the time being- compensated by the use of ICT.

Montevideo, January 30th, 2008