



# The relationship between innovation and export behaviour: The case of Galician firms



Óscar Rodil \*, Xavier Vence, María del Carmen Sánchez

University of Santiago de Compostela, Spain

## ARTICLE INFO

### Article history:

Received 27 May 2014

Received in revised form 24 April 2015

Accepted 1 September 2015

Available online 26 September 2015

### Keywords:

Innovation

Export behaviour

Firms

Galicia

## ABSTRACT

The aim of this paper is to provide new evidence and findings about the relationship between innovation and export behaviour at micro-level (firm). The study is based on the general hypothesis that innovation has a positive effect on firm competitiveness (opening new markets; increasing productivity; creating new products ...). Moreover, it is also based on the complementary assumption that internationalization pushes firms to increase innovation performance (learning-by-exporting hypothesis). From a macroeconomic viewpoint, this bi-directional process leads to improve the trade balance as well as to increase economic growth. Based on such theoretical approach, the main goal of the paper is to analyse the relationship between innovation performance of firms and their export behaviour, as well as the specific factors that influence this relationship. In particular, the research question is to know as to what extent some specific aspects of innovation are relevant when this relationship is analysed.

The study combines different variables concerning innovation (R&D and innovation decision, variety of innovation as a measure of engagement in innovation, types of innovation), structural characteristics (size and sector) and export behaviour of firms (decision to export and export intensity, measured by the weight of exports on total sales). The lack of a single behavioural pattern (firm heterogeneity) underlies this analysis.

The data come from a survey of 213 firms located in Galicia (north-west region of Spain). The research method combines two levels of analysis. Firstly, a descriptive analysis based on statistics is presented. Secondly, multiple and nonlinear regression (logit and tobit) models are estimated. Conclusions suggest that there are new evidences supporting the existence of a positive relationship between innovation and exporting and that some factors (particularly, variety of innovation and marketing innovation) are critical.

© 2015 Elsevier Inc. All rights reserved.

## 1. Introduction

This paper aims at analysing the relationship between innovation and exporting at micro-level (firm), as well as the specific factors that influence this relationship. The general hypothesis is that innovation has a positive effect on firm competitiveness (opening new markets; increasing productivity; creating new products ...). Moreover, it is also based on the complementary assumption that internationalization pushes firms to increase innovation performance (learning-by-exporting hypothesis). From a macroeconomic viewpoint, this bi-directional process leads to improve the trade balance as well as to increase economic growth.

In particular, the research question is to know as to what extent some specific aspects of innovation are relevant when this relationship is analysed. To do this, the study combines different variables

concerning innovation (R&D and innovation decision, variety of innovation as a measure of engagement in innovation, types of innovation), structural characteristics (size and sector) and export behaviour of firms (decision to export and export intensity, measured by the weight of exports on total sales). In essence, the lack of a single behavioural pattern (firm heterogeneity) underlies this analysis.

The data come from a survey of 213 firms located in Galicia (north-west region of Spain) and are focused on export and innovation behaviour of firms. It should be noted that, in this study, exports (international sales) refer to sales outside the country (Spain). The research method combines a descriptive analysis based on statistics with estimates of multiple and nonlinear regression (logit and tobit) models.

The paper is structured as follows. Section 2 presents the theoretical framework of the relationship between trade and innovation, focusing mainly on the firm level. Section 3 deals with the methodological aspects of the research and descriptive analysis. Section 4 presents the main empirical results, including an econometric analysis. Section 5 draws out the main conclusions of the study.

\* Corresponding author.

E-mail addresses: oscar.rodil@usc.es (Ó. Rodil), xavier.vence@usc.es (X. Vence), carmel.sanchez@usc.es (M.C. Sánchez).

## 2. Theoretical framework

### 2.1. Innovation and trade: the general framework

The turn of the millennium has been accompanied by a strong reconsideration of the theoretical framework of international trade in light of the advances that have taken place in the Economics of Technological Change. Indeed, a central issue of the empirical literature in this field is the relationship between the trade patterns of different countries and their technological and innovation behaviour. Some early studies, such as Soete (1987), Porter (1990) or Dosi et al. (1990) are well-established references in this topic. Many of these and subsequent studies draw on an aggregated perspective based on the existing relationship between both realities (innovation and internationalization) through macroeconomic analyses.

In general, studies on this research field pay special attention to the internal capabilities of firms and their innovation performance, which have been emphasized by evolutionary economics (Nelson and Winter, 1982). According to this evolutionary approach, the innovation behaviour of firms allows them to achieve superior performance in a competitive environment.

The trade–innovation relationship has a consolidated macroeconomic framework. Some streams of theoretical models can be distinguished from this macroeconomic perspective. An early approach comes from the neo-endowment models, which focus the analysis of the relationship (innovation–trade) on specialization and that consider the factor endowment as source of competitive advantage (Davis, 1995). According to this view, different endowments among countries concerning materials, (skilled/unskilled) labour, capital and technology should explain their diverse export capabilities.

A second viewpoint proceeds with the neo-technology models, that are mainly founded on theories like the product–life–cycle theory (Vernon, 1966), based on the effects of this life cycle on the decision to export; or the technology-gap theory (Posner, 1961), that focuses on the role played by persistent technological gaps among countries. This second kind of models (Greenhalgh, 1990; Greenhalgh et al., 1994) assume that trade patterns result from technology differences among countries, which can be increased or reduced in line with innovation and diffusion processes.

Lately, other macroeconomic models introduce the possibility of firm heterogeneity. In this sense, the assumption that firms can improve the quality of their products (product differentiation) allows countries to expand their exports (Grossman and Helpman, 1995).

Two general aspects describe the more usual view about this relationship. Firstly, most of these well-known theoretical models draw causality from R&D/innovation to exporting; and, secondly, they assume that there is a direct effect of innovation inputs (R&D) on innovation outputs (new products and/or processes).

In contrast with the first common assumption (effect of R&D/innovation on exporting), an alternative stream of endogenous-growth models assumes a ‘learning-by-exporting’ effect (Romer, 1990; Young, 1991; Grossman and Helpman, 1991; Aghion and Howitt, 1998). According to this hypothesis, firms can learn from internationalization and, therefore, there is a cause–effect relationship from exporting to R&D/innovation. The source of this ‘learning-by-exporting’ effect comes from the firms’ experience with regard to foreign knowledge and technology in the global market. In addition, exporting allows firms to cover the fixed costs of their R&D/innovation efforts.

The empirical framework concerning the macroeconomic level of the relationship between R&D/innovation and trade is large. In general, there is a wide consensus that the export behaviour of countries is positively associated with their technology and knowledge performance. An increasing number of studies reveal this positive relationship for a variety of countries and periods (Fagerberg, 1988; Greenhalgh, 1990; Verspagen and Wakelin, 1997; Narula and Wakelin, 1998; Wakelin, 1998a; DiPietro and Anoruo, 2006; Salim and Bloch, 2009).

It should be noted that this research deals with the concept of ‘Techno-globalism’ (Archibugi and Michie, 1995), which refers to the relationship between technological innovations and internationalization of firms. This perspective considers the creation, transmission and diffusion of knowledge/technology as a part of the globalization process, where firm’s behaviour is crucial.

### 2.2. The linkage between innovation and exporting at the micro level: theoretical approaches and hypothesis

Unlike the above macroeconomic approach, another theoretical approach studies the relationship between innovation and exporting in a more specific way, from a microeconomic perspective that assumes firm heterogeneity. This microeconomic approach, based on the specific analysis of firm reality, produces an increasing number of studies (mostly, case-studies) that reveal the great complexity of this relationship. One factor that contributes to explain the emergence of this literature is the increasing availability of micro-level data. However, a remarkable outcome is the lack of a well-established consensus among the studies conducted from this perspective.

Two considerations can be drawn out from this microeconomic literature. Firstly, concerning the different views about firm productivity, some studies analyse firm decision to export under the assumption of exogenous firm productivity (Melitz, 2003; Bernard et al., 2003; Yeaple, 2005). Literature from other perspectives, such as the resource-based approach (Penrose, 1959; Barney, 1991) or the strategic-management studies (Teece, 1986), allow productivity to be endogenous. Despite this endogenization process takes different ways, export–innovation relationship plays a significant role, since the technological capacity of firms makes them more competitive and, at the same time, these firms can invest in R&D in order to improve their innovation capacity. Recently, several efforts have been made to build a theoretical framework in which firms invest in R&D prior to export (Aw et al., 2011<sup>1</sup>; Bustos, 2011; Constantini and Melitz, 2008). There are additional efforts at the empirical level, including not only R&D (an input into the innovation production function), but also innovation. However, these studies do not include simultaneously these two dimensions in the analysis of the relationship with exporting. In other words, this recent literature tries to endogenise firm heterogeneity by allowing firms to engage in productivity-enhancing activities prior to export (Esteve-Pérez and Rodríguez, 2013).

Secondly, studies including R&D as the only (or main) explanatory factor of the innovation performance have important limitations. There are at least two reasons that lead to this consideration. On the one hand, many innovations do not require R&D to be carried out.<sup>2</sup> On the other hand, R&D does not always lead to innovation (Harris and Trainor, 1995; Mairesse and Mohnen, 2002). Moreover, there may be a significant lag between the former and the latter due to the delayed effect of R&D investment on innovation output (see, for example, Gurnu and Pérez-Sebastián, 2008).<sup>3</sup> Thus, studies that consider only one of these aspects (R&D or innovation) lead to an incomplete understanding of the relationship between innovation and exporting. This may occur due to the complexity of the innovation process, as in many cases it depends on complementary activities (R&D, acquisition of embodied technology, training linked to technological product and process innovation activities ...). In fact, surveys of innovation often show a high statistical

<sup>1</sup> Aw et al. (2011) consider three determinants of firm productivity: R&D, participation in export markets, and a random factor.

<sup>2</sup> Sometimes, innovations may be the result of past R&D rather than the current one; and sometimes, innovations may be developed outside the firm and introduced without R&D investment as a number of surveys of innovation show, like the Community Innovation Survey (Harris and Moffat, 2011).

<sup>3</sup> These authors investigate the relationship between patents and R&D expenditures at the firm level for the U.S. manufacturing sector from 1982 to 1992. Their results show that the lag effects are higher than have previously been found for the 1970s data (Hall et al., 1986).

Download English Version:

<https://daneshyari.com/en/article/5036966>

Download Persian Version:

<https://daneshyari.com/article/5036966>

[Daneshyari.com](https://daneshyari.com)