

Exports-R&D investment complementarity and economic performance of firms located in Portugal

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Abstract

There are a vast number of studies on the relationship between R&D and exports. However, the results are not always clear-cut. This study evaluates whether, in the case of a small, open and peripheral country in which exports are the engine of economic growth despite a noticeable laggardness in terms of R&D, the firms' R&D impacts on and/or is influenced by their exports, as well as whether the interrelation between R&D and exports impacts on the performance of firms. Using an unique dataset comprising all (more than 340 thousands) non-financial companies based in Portugal, over the period 2006-2012, estimations based on bivariate probit models, which provide the simultaneous estimation of the two decisions (R&D and exports), taking into account the correlation between the estimation errors of the equations for R&D and exports, confirm there is complementarity between R&D and exports, which means that engaging in R&D activities will increase the firm's probability of engaging in export activities. Additionally, engaging in export activities will also increase the probability of engaging in R&D. The results also provide support for the hypothesis that more productive firms self-select into exporting activities and also provide support for the learning-by-exporting hypothesis. Finally, based on a panel model we further found that R&D and exports have a positive effect on sales growth, which is enhanced when both activities occur simultaneously.

Key words: exports, R&D, innovation, economic performance, sales growth.

JEL Classification: F14, L25, O32.

Resumen

Hay un gran número de estudios sobre la relación entre la I+D y las exportaciones. Sin embargo, los resultados no siempre son bien definidos. Este estudio evalúa si en el caso de un país pequeño, abierto y periférico —en el que las exportaciones son el motor del

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crecimiento económico a pesar de un retraso notable en términos de I+D—la I+D que realizan las empresas impacta en o está influenciada por sus exportaciones, así como si la interrelación entre la I+D y las exportaciones impacta el desempeño de las empresas. Mediante un conjunto de datos único que comprende todas las empresas no financieras con sede en Portugal (más de 340 miles), para el periodo 2006-2012, las estimaciones basadas en modelos probit bivariados, que proporcionan la estimación simultánea de las dos decisiones (I+D y exportaciones), tomando en cuenta la correlación entre los errores de estimación de ambas ecuaciones, confirman que hay complementariedad entre la I+D y las exportaciones, lo que significa que la participación en las actividades de I+D aumentará la probabilidad de la empresa de participar en las actividades de exportación. Además, la participación en actividades de exportación también aumentará la probabilidad de participar en la I+D. Los resultados también proporcionan apoyo a la hipótesis de que las empresas más productivas autoseleccionan las actividades exportadoras y a la hipótesis de aprendizaje mediante la exportación. Finalmente, basados en un modelo de panel hemos encontrado que la I+D y las exportaciones tienen un efecto positivo sobre el crecimiento de las ventas, que se ve reforzado cuando se producen simultáneamente ambas actividades.

Palabras clave: exportaciones, I+D, innovación, desempeño económico, crecimiento de las ventas.

INTRODUCTION

The export capacity of a company is often considered an indicator of its competitiveness and success (Esteve-Pérez and Rodríguez, 2013), as it is generally assumed that an exporting firm tends to be more productive than a non-exporter (Silva, Afonso, and Africano, 2013).

The differences between exporters and non-exporters have recently been associated with their willingness to invest in intangibles, including Research & Development (R&D). Specifically, Aw, Roberts, and Xu (2011) identified investment in R&D and adoption of technology as relevant factors in explaining the higher productivity of exporters compared to non-exporters. These authors consider that the decisions to export and invest in R&D or technology are interdependent and both influence the future profitability of companies.

The theoretical literature on the relationship between exports and R&D has focused on the firms' process of learning through internationalization, including the impact of such learning on innovation (Girma, Gorg, and Hanley, 2008). According to Girma, Gorg, and Hanley (2008), in order to compete in international markets, exporters have to invest in technology to meet the needs

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