The Two Sides of E-Commerce, Selling and Buying:
An Empirical Analysis at Firm-Level

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INTRODUCTION

The growing use of e-commerce has become one of the most important economic trends of the last years. In particular, e-commerce has provided both consumers and businesses with a powerful tool to face the restrictions imposed by the economic crisis.

On the one hand, many consumers are using the Internet in order to cut down their expenditures. Some estimation indicates that consumers' savings could be up to 17% (OECD, 2009). On the other hand, e-commerce has allowed firms to expand their markets and generate new business opportunities. According to Eurostat's figures (2015), the share of turnover generated by e-commerce activities was about 15% in 2014.

Hence, understanding the factors which drive e-commerce diffusion has become a major issue in the literature. Special attention has been paid to unveil the drivers at firm-level. A proper analysis of such a process implies paying attention to two main elements: firstly, to the adoption by firms, and, secondly, to the intensity of its usage. Moreover, two types of e-commerce should be taken into account: e-selling and e-buying, the former including both business-to-business (B2B), business-to-consumer (B2C) and business-to-government (B2G) transactions; while the latter mostly focused on B2B trade. Eurostat (2015) reports that while in 2014, 40% of European firms with 10 employees or more practice e-purchasing, only 15% are selling via Internet.

Data limitations have lead most research to focus on e-commerce adoption, whereas the literature on the extent and the intensity of usage is much smaller. Within this context, this chapter attempts to throw some light on such issue by presenting a joint-analysis of the adoption and extent of usage of e-commerce at firm-level. Moreover, the two sides of e-commerce are analyzed: e-purchasing and e-selling.

The analysis will be carried out by means of a two-stage modeling process: a first equation to explain the decision of adoption and a second question to study the extent of usage of e-commerce. E-selling and e-buying will be analyzed separately in order to properly assess the drivers of each type of e-commerce. Explanatory factors include firm size, human capital, absorptive capacity, Information and Communication Technology (ICT) infrastructure, market scope and competitive pressures, among others.

The present analysis will allow gaining further understanding of the take-up and use of e-commerce by firms. Results will inform managers about the key factors in order to make the most from the two sides of e-commerce and hence, improve firm performance, which are the main issues addressed in this Encyclopedia.

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BACKGROUND

Diffusion is generally defined as the process by which innovations spread over the economy (OECD & Eurostat, 2005). Understanding the reasons that lead firms to adopt innovations (either new technologies, products or processes) has become one of the major issues for economists since the seminal work of Griliches (1957).

The basic approach to analyze diffusion are epidemic models which state that diffusion is the result of the spread of information from the users of the new technology to the non-users over time (Geroski, 2000). These models rely on two key ideas: firms learn about the new technology from those which are already users and do not get that information at the same time. Such assumptions lead to a path of diffusion similar to an S-curve: at first adoption, takes place slowly; then, as more and more firms use the new technology and share their experiences, the spread of information accelerates and the diffusion speeds up; finally, the market reaches its saturation point and the diffusion rate decreases (Baptista, 1999; Geroski, 2000; Karshenas & Stoneman, 1995).

An alternative to the epidemic approach are those models that consider diffusion as the result of a firm's decision-making process in which the benefits and the costs of the new technology are evaluated. Three main models can be distinguished depending on the determinants of firms' benefits: rank models (also known as probit models) consider that the benefits derived from technology adoption rest on firm's major characteristics (size, workforce' skills, whether the firm carries out innovation activities, among other features) (Geroski, 2000; Karshenas & Stoneman, 1995); stock and order-effects posit that benefits depend on the number of previous adopters and on the order of adoption, respectively; hence, the more number of firms already using the technology and the later adoption takes place, the lower the benefits a firm can get. The underlying assumption in these models is that, despite the uncertainty involved in new technologies, there are first-mover advantages (Karshenas & Stoneman, 1995).

Although these four approaches could be specified separately, several authors have integrated them into the same model in order to better understand the diffusion process of a new technology (Battisti, Canepa, & Stoneman, 2004, 2009; Battisti, Hollenstein, Stoneman, & Woerter, 2007; Hollenstein & Woerter, 2008; Karshenas & Stoneman, 1995). Such integrated model will be the approach used in this paper.

DATA AND METHODOLOGICAL ISSUES

Data

The data used in this study is the result of merging the two following datasets: the 2007 Survey on information and communication technologies (ICT) usage and e-commerce in enterprises and the 2006 Community innovation survey for Luxembourg (STATEC, 2006, 2007). While the former dataset contains information about ICT adoption and use, the later focuses on innovation (as defined in the Oslo Manual) and, in particular, it includes valuable data on the type of competition faced by firms, which is a key factor to explain technological diffusion as indicated by Porter (1990). The merge of these two datasets covers firms with at least 10 employees in manufacturing and services, except for financial activities. This leads to a sample size of 299 firms (1,087 firms if weighted).