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Complementary IT resources for enabling technological opportunism

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ABSTRACT

This study examines the use of information technologies (ITs), IT human capital, the level of IT vendor support, and their joint effects on firm's sensing and responding to IT changes (technological opportunism). Using data from the U.S. and Spain, the results suggest that IT use and the firm's IT human capital are the main drivers of technological opportunism (TO). The effect of IT vendor support on TO is country dependent, with a U-shaped effect in the U.S. and no effect in Spain. IT vendor support can have positive effects on TO if the firm invests in IT human capital.

1. Introduction

Today's business environment is characterized by turbulence, increasing competition and technological advances that threaten to disrupt established products and markets. Previous research claims that demonstrating the value of investing in information technology (IT) is fundamental in the fields not only of Information Systems (IS) but also of management disciplines [1,70]. However, it has been found that the direct effect of IT investment on performance is not as important as its indirect effect through the creation of capabilities [98]. Sensing and responding to the technological context are two capabilities to which researchers have paid more attention in recent years because they increase firm performance [19,65,102,121]. These capabilities have been defined as technological opportunism (TO) capability [107]. However, relatively little research [38,107] has focused on the resources that enhance this capability.

Following the resource-based view (RBV) and knowledge-based view (KBV), this study fills a gap in the literature concerning the antecedents of TO by focusing on the use and knowledge of ITs [60,100]. Recent streams of RBV research have focused on the analysis of complementarities among firm resources to enhance capabilities [70,116,123]. This paper also investigates the joint effect of IT use and the specific knowledge involved in these technologies on TO. This knowledge is part of the firm's resources or is added through the recruitment of specific services offered by other firms.

According to the literature, the IT adoption strategy used by small firms is different from that of large companies, and it also differs depending on the level of knowledge and the technological intensity of the sector [7]. For example, Oliveira and Martins [78] analyzed e-business adoption and found differences in the relative importance of almost all the independent variables analyzed (technology readiness, trading partner collaboration, technology integration, and perceived benefits) between the telecommunication industry and the tourism industry. Competitive pressure is the only variable for which they did not find differences between the two industries. The main barrier to IT adoption for small and medium enterprises (SMEs) is the lack of IT knowledge and the cost of the technology [93,111,112], while for large firms the main problems are bureaucracy and the time necessary to take decisions [13]. In typical SMEs, a dependence on outsourcing compared to larger firms has been shown. Further, this finding has also been more frequent in less IT-intensive sectors [7]. In addition, SMEs have fewer resources than large firms to invest in managing IT activities. In this context, outsourcing is mainly referred to as IT

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consultants or IT vendor support [112]. The focus of this research is on the effect of a high level of use of IT vendor support in a sector with low IT intensity.

Previous research suggests that the type of organization is more important than the industry to explain the need for IT innovations and their adoption [59]. Not all businesses benefit in the same way from using ITs. The benefits are enhanced when there is competition between one group of firms and another Franchising is an example of these networks and is of increasing importance in the economy [87,88]. Franchising represents a network of semiautonomous operators with a central headquarters. Thus, the implementation of IT and its related capabilities, such as TO, can benefit not only a single store, but also the whole network. Franchising is mainly applied in services and retailing, which are considered less IT-intensive sectors. Hence, franchising is an interesting context for examining the effect of IT vendor support on the development of IT capabilities as it represents a strong contrast to the conventional setting of IT-related studies. Several studies have analyzed the implementation of ITs in the franchising context [65,66,88,97] but, to our knowledge, little research has been carried out on the development of IT knowledge capabilities [85] and none has analyzed the IT vendor support decision and its interaction with other resources of the firm.

The primary objective of this study is to focus on the complementarities of IT resources to generate IT capabilities. Previous research has analyzed the joint effect of both internal and external knowledge and capabilities on IT-enabled processes [123,128] and performance [75], but little is known about their effect on enhancing TO capabilities. We focus on the influences of internal and external sources of knowledge and the use of ITs to help firms increase their capability of sensing and responding to radical or incremental technological developments. This allows us to contribute to the management discipline by examining the influence of IT vendor support on TO capabilities and how this effect is influenced by the intensity of IT use and the firm's human capital. Furthermore, we contribute by providing evidence of the complementarities between these resources. Finally, this study investigates the franchising sector in two different countries, the U.S. and Spain, providing evidence of the levels of IT use and excessive IT outsourcing in each country. The two countries use different levels of IT systems and applications [37,103], which are confirmed through the analysis of measurement invariance; hence, we conduct a country-by-country analysis.

Our results suggest that IT use and the level of the firm's IT human capital increase the level of TO. In addition, this research provides evidence of the circumstances in which a high level of IT vendor support can develop the firm's capabilities. Internal IT knowledge and the intensity of IT use are proposed as moderating variables on the relationship between IT vendor support and the firm's level of TO. Results are country dependent.

This paper is organized as follows. Section 2 outlines the literature framework on which the paper is based, the RBV, and develops the hypotheses. Section 3 explains the context of study and describes the methodology used. In Section 4, the results are presented. Section 5 provides a discussion of the results, the limitations of the paper, and recommendations for future lines of research. The concluding remarks are presented in the final section.

2. Literature framework and hypotheses development

A suitable theoretical framework for studying e-business capabilities is the RBV that links organizational resources and capabilities with competitive advantages [6,70]. The RBV suggests that firms can achieve positive outcomes as long as they possess rare, valuable, and appropriate capabilities. If the firm's capabilities resist imitation and substitution, these gains can be sustained. Researchers have analyzed how firms create value from IT assets and the importance of complementary resources for understanding IT payoffs. In sum, how firms create IT capabilities determines their competitive advantages. In IS research, different resources have been shown to be relevant for leveraging IT investments, but there is a consensus about the importance of IT knowledge [12,15]. As part of the RBV, the Knowledge-Based View (KBV) posits that firm performance depends on the level of knowledge exploitation [123,129]. De Clercq and Dimov [26] outlined that knowledge provides a more comprehensive understanding of new information and helps firms identify valuable knowledge. Deeper knowledge enhances the ability to incorporate additional knowledge and exploit it over time. Knowledge is considered a key valuable resource that, combined with other resources, provides competitive advantages.

Different studies support that intangible firm's resources, such as the firm's human capital, or tangible resources, such as financial resources, are the key to success [105]. But complementary external resources or capabilities are also factors that increase a firm's probability of success [8,80]. External sources may help firms acquire abilities or resources they lack about entrepreneurial learning [91]. In the following sections, we will develop hypotheses about how the firm's human capital, IT vendor support, and the level of use of ITs determine its TO capabilities.

2.1. Relationship between use of ITs and TO in retailing

ITs include the hardware, operating software, communications, and other equipment and support required to enable business applications [9,99] that are combined to create useful IT services [50]. Previous studies have analyzed ITs related to enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM), and e-commerce operations [67] and, in the last decade, increasing attention has been paid to ITs such as intranet, extranet, Internet, and electronic data interchange (EDI; [32,20,46,65,73,74,84,122]).

Firms are actively seeking new ways to use IT effectively to support distribution, inventory management, planning, and sales functions [82]. Most ITs are related to the e-business process [101] or are focused on providing retail channel integration through six activities [77]. These activities are integrated promotion, transaction information, order fulfillment, integrated pricing and billing, integrated information access, and integrated customer services. All these activities can be carried out through the use and implementation of Internet, e-commerce, intranet, extranet, EDI, CRM, SCM, and ERP. The use of these ITs allows firms to be connected with suppliers, distributors, and other intermediaries, customers and employees [118]. Intranet, extranet, and EDI also allow firms to reduce the cost of order processing and distribution and inventory management [82], thereby making logistics and SCM more efficient [3,16]. CRM allows firms to analyze customer transaction information [120] and, together with extranets, to provide a better customer service [5]. SCM allows retailers to plan purchase order and inventory control [54]. So, the study of all these technologies allows us to incorporate the most commonly used ITs.

With the proliferation of ITs, it is necessary for firms to anticipate the emergence of new ITs, their benefits for the business, and their likelihood of making current technologies obsolete. The use of ITs develops related capabilities necessary to sense and respond to the opportunities or threats generated by technological changes. This is known as TO capability. The concept of TO capability is measured by two dimensions: "technology-sensing capability" and "technology-responding capability." "Technology-sensing capability" is defined as the extent to which an organization has the capability to acquire knowledge and understand new technological developments. The