



# The influence of environmental and organizational factors on innovation adoptions: Consequences for performance in public sector organizations

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## ABSTRACT

Although technical and administrative innovations have received much academic interest in recent years, our understanding of why some organizations adopt these innovations and others do not is still underdeveloped. This paper examines organizational and environmental factors that may explain the adoption of innovations in public sector organizations. Furthermore, how technical and administrative innovations affect firm performance is also examined. Regarding organizational factors, we analyze strategy and firm size. Regarding environmental factors, we analyze the effect of uncertainty and market concentration. Hypotheses are developed and tested using a combination of archival and survey data from the public healthcare sector. Our results suggest that environmental and organizational factors have inconsistent effects on the adoption of administrative and technical innovations in public sector organizations. Our findings also show that high adopters of both types of innovations are more sensitive to environmental factors than organizational factors. Furthermore, our paper shows that organizations that combine technical and administrative innovations increase their performance.

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## 1. Introduction

As organizations across public and private sectors face an increasingly competitive and dynamic environment, there is more pressure to gain competitive advantage through innovations, which are allegedly better able to improve organizational performance (Hernández et al., 2008). In the public sector, the changing environment has spurred organizations into delivering greater flexibility and quality of services, while they cut the cost at the same time. Public authorities are encouraging organizations to adopt new techniques and systems in order to deliver services on high quality and low cost (Meneu et al., 2005). However, there is evidence that the adoption of innovations varies widely across firms and that many organizations do not adopt innovative techniques despite their apparent benefit (Danneels, 2002; Santos and Alvarez-Gonzalez, 2007). Especially within the public sector, where adoption of innovations tends to be slow and fragmentary (Fagerberg et al., 2005). Studies identifying factors that determine organizations' need for and ability of these innovations in firms are limited and consequently our understanding of why some organizations adopt innovative techniques and others do not is incomplete (Yu and Tao, 2009; Eriksson and Nilsson, 2007).

Researchers on innovation have extensively focused on a single type of innovation, but little is known whether different variables may have different explanatory role depending on the type of

innovation adopted, such as technical and administrative innovations (Armbruster et al., 2008; Damanpour and Gopalakrishnan, 2001). The adoption of technical and administrative innovations is a function of both organizations' need for these new techniques and their ability to recognize this need (Fagerberg et al., 2005; Gopalakrishnan and Damanpour, 1997). Building on contingency theory (Drejer, 2002), this study examines the combined effects of environmental and organizational factors on the adoption of innovations and its subsequent effect on performance (Kimberly and Evanisko, 1981; Löfsten and Lindelöf, 2005). This study helps increase our understanding of innovations in organizations by examining different factors associated with the adoption of technical and administrative innovations, and demonstrates that the implementation of these types of innovations is associated with improved performance. In this vein, we answer a recent plea in the innovation literature for more complete explanations of the origins and consequences of different types of innovation in a single study (see Fagerberg et al., 2005).

In this paper, we examine organizational and environmental factors using a combination of survey and archival data. The organizational factors examined include strategy and firm size. The environmental factors we examined include uncertainty and market concentration. We conduct our study in the public hospital sector in Spain, where health care authorities are encouraging hospitals' management to adopt innovative techniques in order to increase performance (Naranjo-Gil and Hartmann, 2007). In the public sector, the new public management paradigm serves as a common heading of different initiatives that

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many organizations have taken towards delivering greater flexibility and effectiveness under a high deregulation and competition (Kaul, 1997). We use survey data collected from the CEOs of all public hospitals in Spain, for which we obtained a satisfactory response rate of 51.37% with 112 useful questionnaires received out of 218 CEOs.

Our results showed that organizational and environmental factors had inconsistent effects on the adoption of technical and administrative innovations. High adopters of both types of innovations were more sensitive to environmental factors than organizational factors. Our results also showed that organizations that combined technical and administrative innovations increased their performance. This research provides evidence on the contingency factors affecting the adoption of technical and administrative innovations, and documents a specific relationship between organizational performance and technical and administrative innovations in public sector organizations. Furthermore, this study provides general support for the contingency fit in organizations, by showing that both types of innovations must fit well with each other to facilitate organizations perform optimally.

The remainder of this paper is structured as follows. Section 2 introduces the contingency variables salient to innovation adoption and develops our hypotheses. Section 3 describes the research method used. Section 4 presents the results. Finally, Section 5 discusses the conclusions and limitations of this study.

## 2. Theoretical development and hypotheses formulation

Innovative practices – the early adoption of new techniques or methods – are commonly noted among organizations in almost every public and private setting (Yu and Tao, 2009; Eriksson and Nilsson, 2007). In a recent revision of the literature, Fagerberg et al. (2005) describe three streams of research in innovation including (1) the diffusion on innovation, (2) organizational determinants and (3) process theory investigating the avenues of adoption of innovation within organizations (Wolfe, 1994). Researchers on every stream have defined innovation in a multitude of ways, as an outcome such as invention, diffusion or as a process such as creativity or decision making. In this paper, we follow a definition of innovation used extensively in diffusion research (Wolfe 1994; Gopalakrishnan and Damanpour, 1997). Innovation is defined as any practice, process, product or service which is new to the environment of the organization. Under this definition, it is necessary for the practice to be different than current or past practices of that organization, as well as not widely used by other organizations in the environment. Innovations have usually been categorized into sets of contrasting types, such as product vs. process, radical vs. incremental and technical vs. administrative (Fagerberg et al., 2005). The distinction between administrative and technical innovations is important because it reflects the general distinction between social structure and technology in organizations (Gopalakrishnan and Damanpour, 1997, p. 19). Technical innovations are related to the production process, and they include processes and technologies used to produce products or render services related to the basic work activity of a firm (Damanpour and Gopalakrishnan, 2001; Daft, 1978). Administrative innovations are related to the managerial procedures, administrative processes and rules of the organization (Armbruster et al., 2008; Daft, 1978). At hospitals, technical innovations are directly related to the adoption of new techniques for the diagnosis and treatment of diseases. Administrative innovations involve the adoption of new management information and control systems, which are indirectly related to the basic work activity of the hospital and are more related to its management (Santos and Alvarez-Gonzalez, 2007; Vonortas and

Spivack, 2006). In particular, this study is interested in techniques that have been developed over the past decade and have received most attention in the innovation literature. Among the technical innovations we examined sophisticated medical techniques in hospitals, such as computerized axial tomography scan, gamma camera or cobalt bomb. Regarding the administrative innovations we examined the adoption of new management information and control systems, such as Balanced Scorecards, Benchmarking and Activity-Based Costing and Management (Chenhall, 2003). Furthermore, these techniques were also underlined in interviews with CEOs in hospitals. Thus, this study aims to identify factors that distinguish organizations that have adopted these technical and administrative techniques from organizations that continue to rely on more traditional techniques.

How innovations can be promoted or encouraged within organizations has become a concern within the field of innovation study. Researchers under the diffusion approach of innovation seek to identify contextual, structural and organizational characteristics that differentiate innovative from non-innovative organizations (Slappendel, 1996). Most of these studies has relied on a contingency perspective to analyze the factors that influence the generation of innovations at the organizational level (Drejer, 2002; Donaldson, 2001). While research on innovation is growing, little research has examined the contingency variables that affect technical and administrative innovation adoptions and effectiveness (Fagerberg et al., 2005). Recently, several studies argue that organizational and environmental contingencies determine the degree to which organizations will benefit from adopting innovation (Bruque and Moyano, 2007; Bayo-Moriones and Lera-López, 2007). Bayo-Moriones and Lera-López (2007) highlighted the importance of the environment, strategy and internal organization in information and communication technologies adoption. Bruque and Moyano (2007) found that internal organizational factors, such as the socialization of the workers, can facilitate the adoption of innovations. Drawing from these papers, we examine the importance of organizational and environmental variables in explaining the decision for an organization to adopt technical and administrative innovations.

### 2.1. Organizational variables and innovation

Strategy can be defined as a pattern of decisions about the organization's future, which take on meaning when it is implemented through the organization's structure and processes (Mintzberg, 1978; Miles and Snow, 1978). In this paper we use the well-known typology of Miles and Snow's (1978) to differentiate between two opposite strategies: Prospector and Defender. Prospectors are organizations which almost continually search for market opportunities, and they make relatively frequent change in, and additions to, their set of services. Prospectors also respond rapidly to early signals of market needs or opportunities and they consistently attempt to be at the forefront of new service developments (Miles and Snow, 1978). In contrast, Defenders are organizations which have narrow product-market domains. Defenders offer a relatively stable set of services and tends to focus on a particular segment of the population. They offer a limited range of services and they believe that doing the best job possible in their existing range of services and refining existing services are of utmost importance (Miles and Snow, 1978). Although empirical evidence on the relationships between strategy and innovation is not unambiguous, research generally suggests that proactive strategies, such as prospectors, are more likely to adopt innovative techniques (Fiss and Zajac, 2006; Löfsten and Lindelöf, 2005; Bayo-Moriones and Lera-López, 2007). The basic reason is that prospector firms need to make day-to-day

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