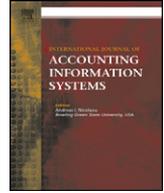




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# Examine ERP post-implementation stages of use and value: Empirical evidence from Portuguese SMEs

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### ABSTRACT

There is a great interest among researchers and practitioners in accounting information systems (AIS) value. This is particularly important in cases of systems such as enterprise resource planning (ERP). This paper empirically measures and analyses the determinants of ERP use and value in a single framework, as well as provides empirical evidence from Portuguese small and medium enterprises (SMEs). Drawing upon theories on the process and contexts of information technology (IT) we postulate nine hypotheses. Used the technology–organization–environment (TOE) framework to hypothesize how compatibility, complexity, efficiency, best-practices, training, and competitive pressure explain ERP use. Based on the resource-based view (RBV) theory we hypothesize how ERP use, collaboration and analytics explain ERP value, and its potential contribution for the nature of management control and accounting information systems on Portuguese SMEs. Through structural equation modeling, a data set of 134 web-surveyed firms is used to test the hypotheses. Our empirical analysis leads to six main findings: 1) compatibility, complexity, best-practices, and efficiency are more important determinants for ERP use as well as training and competitive pressure, suggesting that technological, organizational and environmental characteristics are the main drivers of ERP use among Portuguese SMEs. 2) Similarly, collaboration and analytics are more important for ERP value upon use, suggesting that system capability characteristics are the main drivers of ERP value. 3) ERP value benefits from system enhancements to firms' business processes in the post-implementation phases. 4) For Portuguese SMEs the mostly

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valued metric attained through ERP is management control. 5) Impelled by legislation, Portuguese SMEs are using ERP as the accounting system for management, financial and tax accounting. 6) Portuguese SMEs invest more than 70% of their annual IT budget to ERP use. Together, these findings offer insights into how Portuguese SMEs use and extract value from ERP, and how enhancements positively impact the system's value. Unlike the typical focus on ERP adoption described in the literature, this research focuses on the post-implementation phase, linking actual use with value creation, adding an empirical study to the AIS literature.

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## 1. Introduction

Several authors have pointed out that the relationship between information technology (IT) and firm performance appears to be the most complex, penetrating and unpredictable in the field of accounting information systems (AIS). Generally, firms adopt IT to improve their competitiveness and business performance. Davenport (1998) qualified enterprise resource planning (ERP) systems as the most important development in the enterprise use of IT. ERP's main purpose is to integrate in a collaborative platform as many enterprise functions as possible. In addition, data warehouse technology and the rapidly increased supply of analytical package software have brought many enhancements in multidimensional analytical power and the efficiency of accounting processes (Klaus et al., 2000; Granlund, 2011).

Early contributions in the AIS literature frequently took the form of introductions to the “new” technology coupled with speculations on its implication for management accounting, accountants and control. Perhaps the major problem with these works is their overly simplified assumption that the design and implementation of a management accounting system is about choosing certain solutions, thereby ignoring the post-implementation impact on firms' strategy and organization (Nicolaou, 2004a, 2004b; Granlund, 2011). This is increasingly important, as accountants and managers must deal with a host of complex issues that did not even exist in the past (Hyvönen et al., 2008; Nicolaou and Bhattacharya, 2008; Granlund, 2011). Although ERP may now be considered “old” technology, AIS research lack empirical studies that research the “real-live” importance of ERP and its potential contribution for the nature of management control and accounting information systems (Chapman, 2005; Dechow and Mouritsen, 2005; Quattrone and Hopper, 2005; Nicolaou and Bhattacharya, 2008). This echoes with this current study that aims to empirically understand the importance of ERP thru its ascendants, use and value, which are the foundations to understand its potential benefits to organizations.

Moreover, as the European economy is composed mainly of small and medium-sized enterprises (SMEs), as is Portugal, and despite the widespread use of ERP systems in more northern European countries such as Germany, little research has been conducted to assess post-implementation benefits in practice (Granlund and Malmi, 2002; Scapens and Jazayeri, 2003). Despite the fact that ERP is one of the most inclusive technologies in organizations, not only technically, but also socially constructed (Bradford and Florin, 2003), more prominent amongst SMEs due its particular formations, measuring the ERP use and value is of interest.

Motivated by these issues, through an organizational level perspective, this empirical study on Portuguese SMEs seeks to improve the understanding of ERP by inquiring: What are the determinants driving ERP post-implementation stages (use and value)? To answer this research question we developed a conceptual model based on the technology–organization–environment (TOE) framework and resource-based view (RBV) theory. We empirically study ERP use and value for a sample of 134 Portuguese SMEs. The theoretical perspectives and development of hypotheses are discussed in the next section.

## 2. Literature review and development of hypotheses

Since the impact of IT systems on a firm's performance is mostly long-term and indirect, measures of the ERP system value to business are linked primarily to system use (Devaraj and Kohli, 2003; Nicolaou,

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