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Relationship between management information systems and corporate performance

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ABSTRACT

The literature review on the success of management information systems (IS) provides empirical evidence that mere investment in IS and New Management Tools (NMTs) does not guarantee better business results. Aiming to contribute to the knowledge of the factors explaining the success of IS implementation, this paper classifies them through cluster analysis, with a sample of Spanish companies according to the valuation given by their finance directors (CFOs) to the quality of such systems and their use for strategic purposes. This classification helps to answer three questions: do companies that better rate their IS improve their performance? How do IS quality and strategy affect results? Is there a positive relationship between the use of NMTs and improvement in performance?

Through the non-parametric Kruskal–Wallis test and a partial least squares (PLS) model results are yielded that support the first question and show the positive effect of the IS quality and strategy on improving corporate profitability. Logistic regression showed an interaction between the use of NMTs and the IS strategic approach with positive effects on improving profitability.

The results of this study have significant implications for companies, suggesting that investment in new IS and NMTs must be coupled with a clear sense of strategy.

Relación entre los sistemas de información de gestión y el resultado empresarial

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RESUMEN

La revisión de la literatura sobre el éxito de los sistemas de información de gestión (IS) aporta evidencia empírica que señala que la mera inversión en IS y en nuevas herramientas de gestión (NMT) no garantiza la mejora de los resultados empresariales. Con el fin de contribuir al conocimiento de los factores explicativos del éxito de los IS, este trabajo realiza una clasificación de los mismos a través de un análisis cluster para una muestra de empresas españolas en función de la valoración realizada por los directores financieros (CFOs) sobre la calidad de tales sistemas y su uso con fines estratégicos. Esta clasificación contribuye a responder a tres cuestiones: ¿mejoran más su rentabilidad las empresas con mayor valoración en su IS?, ¿cómo afectan la calidad de los sistemas de información y su enfoque estratégico a los resultados empresariales?, ¿existe una relación positiva entre el uso de NMT y la mejora de los resultados?

A través del test no paramétrico de Kuskal-Wallis y de un modelo Partial Least Squares (PLS) los resultados dan soporte a la primera cuestión, al igual que muestran un efecto positivo de la calidad de los IS y de su enfoque estratégico sobre la mejora de la rentabilidad empresarial. La regresión logística encuentra una interacción entre el uso de NMT y el enfoque estratégico del IS con efectos positivos sobre la mejora de la rentabilidad.

Los resultados de este trabajo presentan implicaciones relevantes para las empresas, ya que la inversión en nuevos IS y NMT debe realizarse con sentido estratégico.

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Introduction

The objective of management accounting is to provide timely and value-relevant information to managers to help them take short and long-term decisions (Gupta & Gunasekaran, 2005).

Nowadays, the environment is extremely competitive and globalised, and technologies are evolving constantly. Firms need more effective and sophisticated management accounting systems to successfully face the new conditions and improve their financial performance (Al-Omiri & Drury, 2007; Gupta & Gunasekaran, 2005; Libby & Waterhouse, 1996; Mia & Clarke, 1999).

In recent years, increasing global competition has intensified the challenges faced by managers, and many experts warn that management accounting needs to adapt to meet managers' changing needs if it is to maintain its relevance (Chenhall & Langfield-Smith, 1998a). Many innovations in management accounting have been introduced in response, in an attempt to improve its utility.

Traditional techniques in management accounting, such as *sections costs*, budgets, standard costs, and direct costs have been combined with more recent techniques over the last three decades. There is no universal consensus on which techniques constitute New Management Tools (NMTs) (Cadez & Guilding, 2008). Nevertheless, most authors consider as NMTs or non-traditional techniques: activity-based costing (ABC), activity-based management (ABM), balanced scorecard (BS), just in time (JIT), total quality management (TQM), target costing (TC), strategic management accounting (SMA), lifecycle costing (LCC), benchmarking and theory of constraints (TOC). The prevalence of these techniques indicates that firms need increasingly accurate and sophisticated management information systems (IS) that adapt to managers' changing needs.

Researchers assume that managers, as rational agents, are unlikely to adopt a management IS that does not help them improve their firm's financial performance (Chenhall, 2003). Thus, management information will conceivably help improve decision-making and, as a consequence, financial performance. Likewise, firms that rate their management IS highly will conceivably adopt NMTs to a greater extent, with the ultimate objective of maintaining and/or improving their financial performance. The current piece of work follows the approach of the abovementioned contributions to the accounting literature and considers that a management IS is successful if it enables the firm to take better decisions and improve its financial performance.

Internal accounting IS differ between companies, for example, in terms of quality, level of use and strategic relevance. Studies in the accounting literature tend to focus on the impact of specific management techniques on financial performance, while few look at the evaluation firms make of their own IS and the relation of these to financial performance. Empirical evidence shows that investment in NMTs does not guarantee better results. The mechanisms through which IS affect a firm's performance are therefore underexamined. This study aims to contribute to this line of research by analysing to what extent quality and the strategic approach of IS improve firm's performance, evaluating the effect that the use of NMTs has on performance.

This study evaluates the management IS of a sample of Spanish firms on the basis of the scores that their financial directors (CFOs) give in two areas: quality of IS (IS quality) and strategic use of the IS (IS strategy), which are identified in a principal components analysis. We use these elements to accomplish a cluster analysis, which identifies three different types of firms depending on their management IS. This typology of firms is then used to answer the following questions:

- Do firms whose management IS scores highly improve their performance?
- How do IS strategy and IS quality affect firms' performance?
- Does a positive relationship exist between the use of NMTs and increased profitability?

The following section analyses the success of IS, their relationship with economic results and the effect of new tools or techniques (henceforth "techniques", NMTs). Then, the research hypotheses and the methodology followed are described, including the sample and the variables used. The fifth section presents the results of the empirical study, while the final section offers the most important conclusions of the research and its limitations.

Literature review

This article deals manly with three basic concepts: the success of IS, financial performance, and the relation between NMTs and performance. First, we will analyse the literature dealing with success in IS, focusing on its effect on corporate results. NMTs are also taken into account.

Success of information systems

This work aims to evaluate the success of management IS and of NMTs; hence, the first step is to define what is meant by success in this context.

The evaluation of IS is a difficult task for researchers (Limayem, Banerjee, & Ma, 2006; Serafeimidis & Smithson, 2000). Similarly, deciding whether an IS or management technique is successful is by no means simple either. According to Petter, DeLone, and McLean (2008), measurement of IS success is both complex and illusive. Thus, for example, it is extremely difficult to define what success is in the case of ABC (Shields, 1995), and some apparent failures of a particular technique may in fact be a consequence of a limited appreciation of the uses for which it was put into practice (Malmi, 1997).

DeLone and McLean (1992) examine the literature on the success of IS and conclude that researchers do not use a single measure of success, but various. These authors established a success evaluation method from 6 different and interrelated dimensions. Later, DeLone and McLean (2003) updated and improved the previous model with 7 variables or dimensions to measure IS success: information quality, service quality, system quality, intention to use, use, user satisfaction and net benefits. These models have been widely used by IS researchers for understanding and measuring the success of IS.

User satisfaction is one of the most important measures of IS success (Urbach & Müller, 2012); it remains, however, an uncertain concept (Livari, 2005). IS users expect the system to be of high quality, to have quality information and to provide substantial benefits (Wu & Wang, 2006). The main determinants of user satisfaction with IS are relevance, content, accuracy, and timeliness (Seddon & Yip, 1992). These elements were all gathered in the IS survey conducted for this study. It is therefore understood that a high score of these factors is related to high IS user satisfaction (in this case, CFOs).

One possible way of evaluating the success of an IS is to determine if its objectives have been met. In other words, if the firm has achieved the benefits that theory suggests it would achieve. This is difficult to decide because such systems often lack clearly defined specific objectives. The objectives are usually generic, such as to improve the process of decision-making, which is extremely difficult to test a posteriori.

Accountancy literature has not reached a consensus about the objectives of IS. In a global context, most objectives can be considered intermediate. That is, they are not the final goals but rather