International Journal of Accounting Information Systems 12 (2011) 20–39

Contents lists available at ScienceDirect

International Journal of Accounting Information Systems

Impact of enterprise resource planning systems on management control systems and firm performance

Juha-Pekka Kallunki [a,1], Erkki K. Laitinen [b,2], Hanna Silvola [c,*]

[a] University of Oulu, Department of Accounting, PO Box 4600, 90014 University of Oulu, Finland
[b] University of Vaasa, Department of Accounting and Finance, PO Box 700, 65101 Vaasa, Finland
[c] Turku School of Economics, Department of Accounting, Rehtorinpellonkatu 3, 20500 Turku, Finland

ARTICLE INFO

Article history:
Received 10 October 2008
Received in revised form 12 February 2010
Accepted 24 February 2010

Keywords:
Enterprise resource planning systems adoption
Formal and informal management control systems
Firm performance
Survey
Path model

ABSTRACT

In this study, we extend existing research on enterprise resource planning systems by exploring the effects of enterprise system adoption on subsequent non-financial and financial performance of a firm. Specifically, we investigate the role of formal and informal management control systems as mechanisms which mediate the effect of enterprise resource planning systems adoption on firm performance. Our empirical analyses are based on survey data drawn from 70 Finnish business units. Overall, our findings demonstrate that formal types of management control systems act as intervening variables mediating the positive lagged effect between enterprise systems adoption and non-financial performance. Informal types of management control systems, however, do not show similar mediating effects. We also predict and find a significant relationship between non-financial and financial firm performance. These results are important because the evidence on the joint roles of enterprise systems and management control system on improving the firm performance is very limited in prior literature. Our results show that the use of enterprise systems results in improved firm performance in the long run, and that more formal than informal types of management controls help firms achieve future performance goals.

1. Introduction

In the last ten years, enterprise resource planning systems (ERPS) have become popular in mid-sized and large firms throughout the world. Prior to this, each function within an organization had its own

* Corresponding author. Tel.: +358 2 481 4324; fax: +358 2 481 4350.
E-mail addresses: juha-pekka.kallunki@oulu.fi (J.-P. Kallunki), ekla@uwasa.fi (E.K. Laitinen), hanna.silvola@tse.fi (H. Silvola).
[1] Tel.: +358 8 553 2956; fax: +358 8 553 2906.
[2] Tel.: +358 6 324 8275; fax: +358 6 324 8344.

1467-0895/$ – see front matter
doi:10.1016/j.accinf.2010.02.001

information system operating separately from the information systems of the other organizational functions (Rom and Rohde, 2007). ERPSs are organization-wide and integrated information systems that can be used to manage and coordinate all the resources, information, and functions of a business from shared data stores. As ERPSs are intended to integrate all corporate information into one central database, they allow all information to be retrieved from many different organizational positions and to make any organization object visible (Dechow and Mouritsen, 2005).

Since ERPSs render all corporate information visible and financial information accessible not solely to accountants, this poses challenges for managerial reporting and control. ERPSs change the role of management accounting by providing management with easy and fast access to relevant and real-time operational data needed in decision-making and management control. The main purpose of management control systems (MCS) is to monitor decisions throughout the organization and to guide employee behavior in desirable ways in order to increase the chances that an organization's objectives, including organizational performance, will be achieved (e.g. Bhimani et al., 2008). MCS can be defined as a tool designed to assist the manager's decision-making consisting of both formal and informal forms of controls (Chenhall, 2003). Formal control consists of contractual obligations and formal organizational mechanisms and can be subdivided into outcome and behavior control mechanisms; informal or social control, on the other hand, relates to informal cultures and systems influencing members and is essentially based on mechanisms inducing self-regulation (Ouchi, 1979). Earlier studies show that ERPSs result in changes in MCS due to increased centralization of system coordination and homogenization of control practices (Granlund and Malmi, 2002). Chapman and Kihn (2009) suggest that formal MCS, and notably budgeting, mediates the effect of ERPS on performance. Granlund (2007) suggests that information technology (IT) may have many notable effects on management control practice, although some of them are realized unintentionally. These studies show only a moderate effect of ERPS on management accounting practices. However, a number of studies suggest that ERPSs drive a role change of accountants from “bean counters” to business analysts (e.g. Granlund and Malmi, 2002; Scapens and Jazayeri, 2003). As ERPSs are organization-wide information systems, they require support from management and employees in order to be successfully adopted. When ERPS are used in tandem with an efficient portfolio of controls, they may achieve an organization's objectives and lead to improvements in performance.

When assessing the potential effects of ERPSs, it is important to make a distinction between financial and non-financial performance effects. Financial performance refers to the ability to generate profits or profitability assessed by financial measures such as the return on investment ratio (ROI). Non-financial performance refers to organizational effectiveness and efficiency assessed by non-financial measures such as manufacturing lead time, labor efficiency variance and number of customer complains. The potential non-financial benefits of ERPSs include productivity and quality improvements in key business areas such as product reliability, customer service, and knowledge management (Hunton et al., 2003). ERPSs are expected to result in a better designed information system, which in turn increases the organizational efficiency and the effectiveness of attaining desired organizational outcomes (Nicolaou, 2004b). However, the relationship between improvements in efficiency, effectiveness and the financial performance of the firm is empirically unclear (Kaplan, 1990; Fisher, 1992). Furthermore, the recent empirical evidence on the effects of ERPSs on organizational performance is contradictory; the existing literature shows statistically that those organizations which implemented ERPS a few years ago nowadays perform either better (e.g. Hunton et al., 2003; Nicolaou, 2004a; Nicolaou and Bhattacharya, 2006, 2008; Wier et al., 2007) or worse than the firms which have not implemented ERPS (Poston and Grabski, 2001). These contradictory results may be due to the time lag between the initial ERPS adoption and its desired effects on performance. To illustrate, Nicolaou (2004a) has shown that it takes at least two years before ERPS adopters begin to achieve positive financial performance.

The studies discussed above typically do not examine the role of MCSs in achieving desired firm performance. In spite of its obvious importance, research on the relationship between ERPSs and MCSs is still in its infancy (e.g. Granlund, 2007; Nicolaou, 2008). This issue has mainly been addressed by case studies describing either ERPS as an implementation process (e.g. Rose and Kraemmerkaard, 2006) or then the effects of ERPS adoption on management accounting and the accounting profession (e.g. Granlund and Malmi, 2002) and on the centralization of organizations (e.g. Quattrone and Hopper, 2005) without considering potential effects on perceived performance. In essence, a broader and more generalizable view of the interrelation between MCSs and ERPSs is still lacking (e.g. Chapman, 2005; Chapman and Kihn, 2009;