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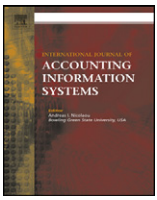

Incentive effects of enterprise systems on the magnitude and detectability of reporting manipulations

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ABSTRACT

We consider how the information environment effects of enterprise system (ES) forecasting tools affect a given manager's decision to manipulate reported performance. As ES forecasting accuracy increases, the manager is better able to determine whether anticipated performance is going to exceed the desired level of performance, and we propose that this may affect how the manager chooses to use the ES. To investigate this setting, we construct a model of manipulation behavior as a function of desired performance, uncertainty in forecasted performance and internal control strength. The implications of the model suggest that as a manager's forecast of an impending shortfall in expected performance becomes more certain, the economically optimal decision is increasingly to manipulate reported performance and to use smaller magnitude adjustments. This result holds unless a significant countervailing investment in internal control strength accompanies the ES, which evidence suggests is not the norm in practice. This study furthers our understanding of the effects of ES adoption on managerial behavior and contributes to the burgeoning literature investigating the dual control and empowerment roles of technology. Opportunities for future research are discussed.

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1. Introduction

Over the last twenty years organizations have made significant investments in enterprise systems (ES), generating broad interest among academics and practitioners in the organizational effects associated with

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ES.[3] Numerous studies have focused on issues related to the implementation of ES (Esteves and Pastor, 2001; Shang and Seddon, 2002; Grabski and Leech, 2007; Bradley, 2008; Grabski et al., 2011). A common thread in this research is the assumption that ES are consistently a force to achieve the objectives of firm stakeholders, and only implementation related failures or resistance to change prevent positive organizational outcomes (e.g. Lee and Myers, 2004; Soh and Sia, 2004; Ward et al., 2005; Paré et al., 2008; Wailgum, 2009).

Without disputing that ES implementation is generally cost-beneficial for an organization, recent research has begun to consider its effect on internal controls and reported performance manipulation, and produced mixed results. For instance, Brazel and Dang (2008) make the assumption that ES adoption lowers transparency across the organization as well as effectiveness of internal controls (Hunton et al., 2004; Brazel and Agoglia, 2007; Kuhn and Sutton, 2010), increasing the opportunities for manipulation. On the other hand, studies such as Morris and Laksmana (2010) and Dorantes et al. (2009) postulate that ES adoption increases transparency, and based on their evidence, they conclude that opportunities to manipulate earnings are decreased. Despite differing assumptions and predictions, both sets of studies report results largely consistent with expectations.

Archival studies of this setting are undoubtedly valuable and informative; however, they have limitations. First, the research relies on prediction error models (e.g. the Jones model and variants thereof) that cannot teach us about the presence of managerial manipulation not deemed 'abnormal' (i.e. too small or obscured by variance). Second, ES implementation often has a profound impact on business operations (Willcocks and Sykes, 2000), suggesting that the definition of 'normal' accruals will be different post-adoption. As such, a model developed using pre-implementation data to predict post-implementation manipulation is difficult to interpret. Finally, the inference from archival investigations is fundamentally about magnitude of manipulation, not propensity to manipulate. This important gap in our understanding of the effects of ES adoption on reported performance manipulation is well suited to examination via analytic model. To that end, we develop a single period model that captures the economically optimal level of manipulation of reported performance as a function of managers' forecast uncertainty and strength of internal controls.

Expectancy theory, introduced by Vroom (1964), motivates the importance of forecast uncertainty in our setting. Expectancy theory posits that a manager's motivation to contribute effort is driven by the following: manager's expectation that exerting effort will lead to the performance related goal (expectancy); manager's belief that attainment of the goal will lead to reward (instrumentality); and the value that manager places upon the reward (valence) (Vroom, 1964; Locke, 1968; Behling and Starke, 1973; Ferris, 1978; Locke and Latham, 2002). An ES affects manager expectancy in at least two ways: First, an appropriately selected and implemented ES will improve the manager's understanding of whether the anticipated reported performance is going to reach the level required to receive the reward. This is a function of the well-documented forecasting benefits associated with an ES (Chen et al., 2003; Catt et al., 2008; Dorantes et al., 2009). In the rest of our discussion we use the abbreviation ESF to reference ES based forecasting tools.

Second, it has been widely documented that when a performance shortfall relative to the target is identified, and opportunities to affect performance via effort are limited or unavailable (e.g. near the end of a reporting period), a manager may undertake to manipulate the reported performance (Das et al., 2009).[4] Among other factors, the decision to manipulate is a function of the expected benefits of successful manipulation versus the probability of and penalty associated with detection of the manipulation. An ESF will affect this calculation by reducing uncertainty about the distance to the goal (i.e. the understanding of how much manipulation is necessary) and about the effects of any manipulation introduced (i.e. whether actual performance plus manipulation is likely to result in the targeted performance). As such, consistent with the existing research on manipulating performance reports, the presence of an ESF will affect when and to what degree a manager will choose to attempt to bring the reported level in line with the targeted level.

We derive two primary inferences from the results of the model. First, as the uncertainty of managerial predictions declines, the manager is increasingly motivated to attempt to manipulate reported performance.

[3] "Enterprise systems are commercial software packages that enable integration of transactions-oriented data and business processes throughout the organization (and perhaps eventually throughout the entire interorganizational supply chain)." Markus and Tanis (2000, p. 176).

[4] It is an open empirical question whether and to what degree a manager would choose to exert genuine effort instead of manipulating reported performance; however, this is beyond the intended scope of this study.

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