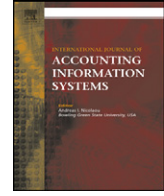




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A conceptual model for segregation of duties: Integrating theory and practice for manual and IT-supported processes



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ABSTRACT

A fundamental element of internal control is the maintenance of adequate segregation of duties (SoD), the allocation of work so that an individual cannot both perpetrate and conceal errors or fraud in the normal course of their duties. Notwithstanding its importance, there has been limited research describing the conceptual basis for determining how duties should be segregated. Significant differences exist between the SoD model proposed in the theoretical literature, the model described in the pedagogical and practitioner literature and auditing standards, and the practices commonly implemented by organizations. The purpose of this paper is to synthesize a prescriptive model for SoD that reflects the insights of all three domains to address the weaknesses of each, and can be applied effectively. The synthesized model calls for segregation of six sets of duties among a minimum of five employees: three duties for manual processes, including asset custody and recording, primary authorization, and secondary authorization; and three more duties for computer-supported processes: access control granting, primary authorization of access control granting, and secondary authorization of access control granting. The model differentiates between a primary SoD, which enables detection of errors and requires at least two employees for manual processes and three employees for IT-supported processes, and a secondary SoD, which helps organizations maintain a consistent, repeatable level of internal control and requires at least three employees in a manual setting and five employees in an IT-supported setting. This is significantly different from both the three-way segregation called for in the theoretical literature and the model described in the pedagogical and practitioner

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literature and auditing standards. Insight provided by the new model also provides an opportunity for organizations to enhance the quality and/or reduce the cost of internal control in practice. Several future research opportunities are identified.

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1. Introduction

Since the implementation of the Sarbanes–Oxley Act of 2002, the effective design and implementation of internal control has been a central question in accounting and auditing research (Ogneva et al., 2007; Beneish et al., 2008; Cohen et al., 2008; Hammersley et al., 2008; Ashbaugh-Skaife et al., 2009; Jiang et al., 2010) and practice (Hare, 2009). A fundamental element of internal control is the maintenance of adequate segregation of duties (SoD), the allocation of work so that an employee cannot both perpetrate and conceal errors or fraud in the normal course of performing their duties (Stone, 2009). SoD is one of the six important characteristics to be considered in the selection and development of Control Activities (Principal 10's 'Points of Focus') in the COSO framework (COSO, 2013),¹ and is cited in PCAOB Audit Standard No. 5 (PCAOB, 2007) and in auditing standard AU 314 (AICPA, 2006). In practice, implementing adequate SoD is a challenge, particularly for small firms (COSO, 2013). Gramling et al. (2010) found that in 2008, a majority of smaller firms with material weaknesses in internal control reported one or more SoD weaknesses.

Notwithstanding its importance, there has been very little research describing the conceptual basis for determining how duties should be segregated to enhance internal control and how SoD differs from traditional division of labor approaches.² Further, as described in the remainder of this section, there are significant differences between the SoD proposed in the theoretical literature and that proposed in the pedagogical and practitioner literature and auditing standards, and between the latter model and practice. These include whether an authorizer is able to initiate a transaction, whether secondary authorizations are performed, whether recording need be segregated from other duties, and whether custody of physical assets should be segregated from records-based assets. The purpose of this paper is to integrate these models and practice, and present a new prescriptive model for manual and computer-supported process.

Only four theoretical research papers have addressed SoD using agency theory, and they do so by focusing on collusion. Tirole (1986) investigates the costs associated with a lack of independence between two roles: the agent (i.e., employee) and their supervisor. Agents have custody of assets or make decisions affecting their value. Supervisors act as conduits to the principal (the owner(s) of the firm) for information about the agent's actions. This is depicted in the top row of Fig. 1. This segregation of asset custody and decision-making from independent supervisory review and reporting to the principal is the most fundamental SoD. The value of supervisory review is compromised if the supervisor colludes with agents to withhold information from the principal and share the benefits arising from this. This results in higher costs for the principal. Building on Tirole (1986), later studies examine how these costs can be reduced by providing the principal with a second source of information about the agent's activity, including another supervisor (Kofman and Lawarrée, 1993)³ or peer agents (Beck, 1986; Barra, 2010). This is depicted as 'Secondary Review' in Fig. 1. The secondary source also provides the principal with information about the quality of primary supervisory review. This leads to a model segregating three duties: having custody of and making decisions about assets (done by the agent); primary review of the agent's activity (done by an independent supervisor); and secondary review (by a second independent agent, supervisor or external auditor) (Fig. 1).

A second, very different model is described in the pedagogical and practitioner literature and auditing standards. This model (Fig. 2), hereafter called the 'practitioner model' (Elsas, 1996; Elsas et al., 1998;

¹ The COSO framework (COSO, 2013) states that "Management segregates incompatible duties, and where such segregation is not practical management selects and develops alternative control activities." (p.89).

² The division of labor traditionally focuses on allocating production tasks to optimize labor and aggregate process efficiency, while SoD focuses on reducing the losses from opportunistic or suboptimal performance of production tasks. The two approaches may call for different task allocations. This conflict has long been recognized in the agency theoretical literature (Carmichael, 1970). See footnote 8 below for a more detailed discussion.

³ Kofman and Lawarrée (1993) use the manager, internal and external auditors for their three-way model. These are equivalent to the roles of agent and primary supervisor and secondary supervisor which are more commonly used in the theoretical literature.

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