Operations Research Applications in Audit Planning and Scheduling

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Abstract—This paper presents a state-of-the-art survey of the operations research models developed for internal audit planning. Two alternative approaches have been followed in the literature for audit planning: (1) identifying the optimal audit frequency; and (2) determining the optimal audit resource allocation. The first approach identifies the elapsed time between two successive audits, which can be presented as the optimal number of audits in a given planning horizon, or the optimal number of transactions after which an audit should be performed. It also includes the optimal audit schedule. The second approach determines the optimal allocation of audit frequency among all auditable units in the firm. In our review, we discuss both the deterministic and probabilistic models developed for audit planning. In addition, game theory models are reviewed to find the optimal auditing strategy based on the interactions between the auditors and the clients.

Keywords—Operations research applications, audit frequency, audit planning, audit-staff scheduling.

an audit plan: (1) determining the internal audit frequency for each auditable unit, and (2) allocating audit resources among all auditable units. For each auditable unit in the company, the first approach determines the optimal elapsed time (or the optimal number of transactions) after which an audit should be performed. The second approach, however, determines the optimal audit resource allocation among auditable units. This paper presents a comprehensive survey of the optimization models developed for audit planning. To our knowledge such a complete survey has yet to be reported in the literature and, thus, the motivation behind this article.

Ref. [3] presented a comparison between periodic audit and continuous audit. He defied the periodic audit to be the one conducted once at the close of financial or trading period while the continuous audit is the system of audit conducted continuously throughout the year at regular intervals. Therefore the optimization models presented in this research paper can identify the optimal continuous audit.