

# **Abstract**

**Abdel Aziz Mohammed**

## **Operations Research Applications in Audit Planning and Scheduling**

Abstract: This paper presents a state-of-the-art survey of the optimization 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, 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. The most common audit resources are time and budget. 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. Several numerical examples are presented throughout the article to demonstrate the model applications in practice. Optimization models for auditing in the banking industry are presented. Keywords: Optimization models, Resource allocation, Audit frequency, Audit-staff scheduling, Internal audit planning.