

# **The Relationships between Computer Auditing Activity and Performance**

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## **Abstract**

The majority of previous studies on CAATTs have discussed implementation willingness and the factors that influence willingness. However, few studies have addressed how internal auditing performance can be improved after implementing CAATTs. The implementation of CAATTs in the industry remains in the early stages, and the effectiveness of the CAATTs used by corporations is difficult to observe. Therefore, this study examined the relationships between the performance and computer auditing activity. The result found computer auditing activity significantly and positively influenced internal auditing performance.

**Keywords: computer audit, performance, internal audit, CAATTs**

## **Introduction**

With the rise in global competition, firms seek innovation as the primary means to obtain a competitive advantage and improve operational efficiency. Innovations in information technology (IT) play a key role in achieving these goals. Since the introduction of material requirement planning (MRP) and enterprise resource planning (ERP), IT has facilitated product innovation, process innovation, and increased efficiency. Furthermore, IT innovations typically result in enterprise growth.

However, over the past 10 years, fraud, financial turbulence and crises, and transnational litigation have caused economic losses throughout the world. Following the Enron and WorldCom scandals in the United States, the U.S. Sarbanes-Oxley Act and similar legislation in other countries have demanded increased corporate governance. Nevertheless, according to an investigation conducted by the Association of Certified Fraud Examiners (ACFE) in 2010, global enterprise losses resulting from fraud amounted to more than US\$2.9 trillion dollars. The clear increase in losses for

2010 compared to that for 2008 indicate that fraud continues to rise despite the Sarbanes-Oxley Act reinforcing internal audit controls. Therefore, the internal control environment of corporate has changed with the rapid development of IT. In an environment where audit trails have declined significantly or even disappeared, audit risk has increased for internal auditors. To improve their work efficiency and effectiveness, auditors must adopt IT to satisfy the work demands of the IT era.

CAATs enable internal auditors to focus on high-risk business activities, reduce audit costs, improve efficiency, and enhance audit quality [4]. CAATs are automated auditing techniques that if fully employed, allow companies to conduct continuous auditing or continuous monitoring to benefit business activities and improve information processing efficiency [6].

Previous studies on computer auditing have addressed several topics. For example, Kuhn and Sutton (2010) [12] investigated various models of operation for computer auditing. They held that two operation models exist, that is, embedded audit modules (EAMs) and monitoring control layers (MCLs), and compared the advantages and disadvantages between the two. Gonzalez, Sharma, and Galletta (2012) [7] used unified theory of acceptance and use of technology (UTAUT) to discuss the purposes of implementing computer auditing. Vasarhelyi, Alles, Kuenkaikaew, and Littlely (2012) [16] discussed computer auditing maturity models. They used audit maturity models to divide computer auditing ability into five stages and investigated the computer auditing ability of various companies. Although previous studies have addressed a number of issues within computer auditing, few have made empirical contributions and conducted empirical investigations regarding the performance for enterprises following the implementation of computer auditing. Based on the research problems, the study investigated the correlations between performance and computer auditing activity by using partial least squares (PLS) methods.

## **Literature Review**

### **CAATs**

Computer auditing is one aspect of internal auditing that enables internal auditors to extract data from information systems and identify exceptions. Computer auditing differs from traditional auditing. The traditional auditing method employs sample and manual to execute audit work. Traditional audits require considerable human resources and time to execute. Furthermore, because traditional audits do not retain the audit trail in an information system, auditors cannot obtain sufficient and appropriate evidence to conduct comprehensive audit activities and maintain audit quality (Table 1).

Traditional auditing	Computer auditing
Uses sampling to conduct audits	Obtains all available data to conduct audits
Adopts manual methods to perform audits	Automatically performs audits
Requires substantial time	Timely executes audits and submits the audit analysis results
Incurs significant costs	Reduces internal audit costs
Cannot retain audit trails in the Information system	Saves audit trails in information system
Repeat audit work must be conducted manually	Audit programs can automatically repeat audit work

Table 1. Comparison between traditional auditing and computer auditing

Resource: Chan and Vasarhelyi (2011)

Among computer auditing techniques, CAATs are commonly employed to audit application controls [8]. CAATs can integrate various system or database formats, and facilitate analysis to achieve the audit objective. CAATs can be applied to the accounts payable, accounts receivable, anti-money laundering efforts, banking compliance, SOD, order-to-cash (OTC) processes, etc. These applications include a number of general controls and all application controls. CAATs can also be used to write script for automated periodic audits and achieving continuous auditing and continuous monitoring according to management objectives [6]. The analytic capabilities of CAATs are data analysis, applied analytics, managed analytics, continuous auditing, and continuous monitoring [1].

### **Computer Auditing Activity and Performance**

CAATs assist internal auditors by automatically obtaining complete data and executing analyses. Internal auditors can repeat audit work by executing automatic audits, thereby reducing audit time and costs. In actual cases, Siemens, Sonae Distribuição Brasil, and MTN Nigeria substantially reduced their audit costs by employing computer auditing (Table 2). Therefore, companies aiming for efficient internal auditing must implement CAATs.

Company	Siemens	Sonae Distribuição Brasil	MTN Nigeria
Benefit	Reduced manual compliance costs to US\$19 million	Reduced stalled inventory by US\$2.15 million in four months	Reduced the costs of monitoring potential leakages and fraud to US\$60 million

Table 2. Benefits of implementing CAATTs

Resource: Alles et al. (2006), ACL (2012), and ACL (2012)

The primary function of computer auditing is to assist with the performance of internal audits [18]. The goal of internal auditing is to ensure the effectiveness of internal control, which are designed to facilitate sound company management. It is to reasonably guarantee the achievement of the following three goals: (1) Operational effectiveness and efficiency, which refers to achieving company profit objective, and asset security; (2) reliability in financial reporting to ensure external financial statements,; and (3) regulatory compliance, which refers to all operations of a company meeting regulatory requirements without violating any laws. Internal auditing develops audit policies based on these three goals and set audit objectives for the execution of audit after assessing risks. Internal auditors should also develop a scope and projects for their computer auditing activities based on the developed audit policies. If the planned computer auditing activities can be completed according to schedule and the expected quality attained, the computer auditing team has successfully maintained the quality and efficiency of their auditing work. Relevant performance can be measured using indicators or metrics of team project performance, such as efficiency, completeness, compliance or accommodation with work progress, outcome quality, interaction, and communication [9] [17] [11] [13].

Therefore, the implementation of computer auditing can increase enterprise efficiency and benefits. Previous studies have also found that complete computer auditing establishment can conserve internal auditors' manpower resources, reduce audit costs, reduce the time spent executing audit tasks, increase audit quality, and enable enterprises to improve operating efficiency [16] [7] [14] [10] [15]. Vasarhelyi et al. (2012) [16] conducted interviews with companies and found that they were all required to adhere to the Sarbanes-Oxley Act and had established specific departments to monitor and confirm their compliance. Computer auditing can assist in implementing Sarbanes-Oxley Act requirements, as well as facilitating monitoring activities and reducing monitoring time. Therefore, improvements to computer auditing activities may enhance enterprise efficiency and benefits. The study proposes Hypothesis as

follows:

Therefore, the study propose Hypothesis as follows:

H: The computer auditing activities positively influences computer auditing activity performance.

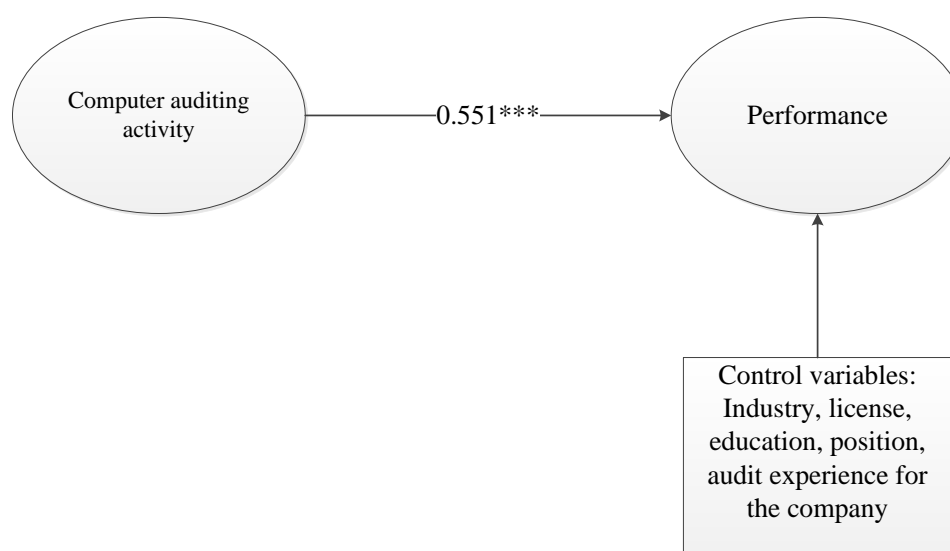
## **Research Design**

### **Measurement**

The study referenced studies from literature to measure the computer auditing activities [16] [5] [12] [17]. The study categorized these items into the categories of planning, audit execution, and reporting. For performance, the study explored the participants' cognition regarding the performance of implementing computer auditing activities. The study examined prior studies from literature review to construct dimension of performance [16] [3]. The study investigated the correlations between performance and computer auditing activity by using partial least squares (PLS) methods. We use education, industry, licenses, position, and audit experience for the company as control variables. Questionnaires were distributed for member of the Institute of Internal Auditors in Taiwan. We use 7-point Likert scale to measure items.

### **Result**

There are 246 valid questionnaires of 340 questionnaires and 188 questionnaires were filled out by internal auditors who company implementation CAATTs. Therefore, our test sample had 188 questionnaires. All factor loadings were exceeding 0.5, and all factor loadings exceeded the cross-loadings, the composite reliability exceeded the standard of 0.6. Further, Cronbach's alpha exceeded the standard of 0.7. The AVE exceeded 0.5, the square root of the AVE for each construct was greater than all other cross-correlations. Hence the model had fitted convergent validity and discriminant validity. This study examined the relationship model on the sample (Figure1). The results showed that computer auditing activity had a significant effect on performance ( $\beta = 0.551$  at  $p < 0.001$ ). Thus, hypothesis was also supported.



Note: \* = significant when  $p < .05$ , \*\* = significant when  $p < .01$ , and \*\*\* = significant when  $p < .001$

Figure 1 The result of the relationships between computer auditing activity and performance

## Conclusion

Computer auditing activity significantly and positively influenced internal auditing performance. This indicates internal auditors that companies with CAATTs implementation thought that the computer auditing activity influenced their performance. For practical applications, the results of this study show enterprises how computer auditing activity to enhance internal auditing performance. Hence, when company want to enhance internal auditing performance, they need consider how to construct computer audit and strengthen the computer audit process.

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