Auditor Acceptance of Computer-Assisted Audit Techniques

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SUMMARY

To meet the challenges of rapid advances in client information technology usage, audit standards suggest that auditors adopt computer-assisted audit tools and techniques (CAATs). However, recent research suggests that CAATs acceptance is fairly low and varies among firms (Liang et al. 2001; Debreceny et al. 2005; Curtis and Payne 2008). This paper employs the unified theory of acceptance and use of technology (UTAUT) model to identify factors influencing auditor acceptance of CAATs. Examining auditor acceptance of CAATs is important since researchers and practitioners argue that CAAT usage will improve audit efficiency and effectiveness. Data was obtained from 181 auditors from Big 4, national, regional, and local firms. Results indicate that performance expectancy and facilitating conditions such as organizational and technical infrastructure support influence the likelihood that auditors will use CAATs. These results suggest that to increase CAAT usage, audit firm management may want to develop training programs to increase auditors' degree of ease associated with using CAATs. Furthermore, audit firm management may want to enhance their organizational and computer technical support for CAATs to encourage their usage.

Keywords: CAATs, auditor acceptance, technology adoption.

Data Availability: Data used in this study is available from the authors on request.

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INTRODUCTION

While the use of information technology (IT) in the business world has grown exponentially in the past two decades, the extent to which auditors have adopted IT such as computer-assisted auditing techniques (CAATs)[1] to meet this growth remains an empirical question (Arnold and Sutton 1998; Curtis and Payne 2008; Janvrin et al. 2009). CAATs are computer tools that extract and analyze data from computer applications (Braun and Davis 2003). CAATs permit auditors to increase their productivity as well as that of the audit function (Zhao et al. 2004, 389). For example, CAATs may automate previously manual audit tests reducing total audit hours expended. They enable auditors to test 100 percent of the population rather than a sample, thereby increasing the reliability of conclusions based on that test (AICPA 2001; Curtis and Payne 2008). In addition, CAATs may be used to select sample transactions meeting specific criteria, sort transactions with specific characteristics, obtain evidence about control effectiveness, and evaluate inventory existence and completeness (AICPA 2006).

Recent audit standards encourage auditors to adopt CAATs to improve audit efficiency and effectiveness (AICPA 2001, 2002a, 2002b, 2002c, 2006). For example. SAS No. 106 suggests that CAATs may be used to improve audit efficiency by recalculating information provided by audit clients (AICPA 2006). Furthermore, SAS No. 106 indicates CAATs increase audit effectiveness by allowing auditors to directly inspect evidence stored in electronic form (AICPA 2006). Improving audit efficiency and effectiveness is particularly important in today's audit environment where auditors have enhanced responsibilities for detecting fraud due to SAS No. 99 requirements and internal control effectiveness as directed under Section 404 of the

[1] Some researchers refer to CAATs as *computer-assisted audit tools* or *computer-assisted audit tools and techniques* (i.e., Braun and Davis 2003; Zhao et al. 2004).

Sarbanes-Oxley Act and Public Company Accounting Oversight Board (PCAOB) Audit Standard No. 5. Despite the current emphasis on CAATs, research indicates that auditors do not frequently and systematically use CAATs (Liang et al. 2001; Kalaba 2002; Debreceny et al. 2005; Shaikh 2005; Curtis and Payne 2008; Janvrin et al. 2009). Auditor acceptance of CAATs may be driven by both firm resource issues and individual user perceptions. Prior information systems research indicates that even when sufficient resources exist to purchase IT, users may not use (i.e., accept) the new IT (Davis 1989). Thus, the primary purpose of our research is to examine factors that influence individual auditor acceptance of CAATs.

Information systems research has developed several models to predict user acceptance of IT. This study uses a recent technology acceptance model, the unified technology acceptance and use of technology theory (UTAUT) (Venkatesh et al. 2003). UTAUT integrates several previously accepted models to assess the likelihood of success for new technology introductions. Understanding the drivers of acceptance allows researchers and audit firm management to proactively design interventions (including training, marketing, etc.) targeted at populations of auditors that may be less inclined to adopt and use new systems (Venkatesh et al 2003). UTAUT proposes that four factors influence user acceptance: (1) the expectation users hold regarding how well the system may improve their performance (i.e., performance expectancy), (2) the degree of effort users believe will be needed to use the new system (i.e., effort expectancy), (3) the extent users perceive that individuals important to them encourage system usage (i.e., social influence), and (4) the expectation users hold regarding the existence of an organizational and technical infrastructure to support system usage (i.e., facilitating conditions).

We obtained data from 181 auditors representing Big 4, national, regional, and local firms. Results indicate that performance expectancy and facilitating conditions are the most

likely predictors of CAATs acceptance. These results suggest that to increase CAAT usage, audit firm management may want to develop training programs to increase auditors' degree of ease associated with using CAATs. Furthermore, audit firm management may want to enhance their organizational and technical infrastructure supporting CAATs to encourage its usage. Furthermore, we find that auditors employed by Big 4 firms are more likely to assign higher ratings to performance expectancy and facilitating condition factors than those employed by smaller firms.

These findings are important to both researchers and practitioners. Solomon and Trotman note that the audit profession is "rapidly advancing in response to change in its environment" (2003, 409). Thus, pressure to improve audit efficiency and effectiveness exists within the audit profession (Chaney et al. 2003; Bierstaker et al. 2006). Since researchers and practitioners (Winogard et al. 2000; Manson et al. 2001; Bell et al. 2002; Braun and Davis 2003) argue that CAATs will improve audit efficiency and effectiveness, our results may assist both researchers and practitioners as they work to increase CAAT acceptance. Furthermore, prior studies assessed only a limited number of CAATs using rather narrow participant groups and were focused more on the prevalence of CAATs rather than the underlying reasons for their use (e.g., Lovata 1990; Braun and Davis 2003; Debreceny et al. 2005). In contrast, our study examines factors impacting CAAT usage by 181 auditors from Big 4, national, regional, and local firms. Finally, we provide information practitioners may use to improve the likelihood of successful adoption of CAATs.

BACKGROUND AND LITERATURE REVIEW

Prior CAAT Research

IT has greatly impacted the audit profession in the past two decades. More firms are using electronic workpapers (Winograd et al. 2000; Shumute and Brooks 2001; Pricewaterhouse Coopers 2003) and larger firms are developing computerized decision aids for audit functions such as client acceptance and risk assessment (Bell and Carcello 2000; Bell et al. 2002; Dowling and Leech 2007). One type of IT often promoted by professionals and now recommended by audit standards is CAATs. Although CAATs can be broadly defined to include any use of technology to assist in the completion of an audit, a more common definition is to restrict the use of the term to 'tools and techniques employed to audit computer applications and used to extract and analyze data' (Braun and Davis 2003, 726). CAATs improve audit efficiency by allowing auditors to perform previous manual intensive tasks quickly and efficiently (Zhao et al. 2004). Furthermore, CAATs improve audit effectiveness by enabling auditors to select sample transactions meeting specific criteria, obtain additional information about control effectiveness, and test 100 percent of populations (Braun and Davis 2003; AICPA 2006).

Prior CAAT research is generally descriptive in nature. Braun and Davis (2003) surveyed governmental auditors regarding their usage of Audit Command Language (ACL), a commercially available CAAT. They found that while participants perceived the potential benefits associated with ACL, they displayed a lower confidence in their technical abilities to use ACL (Braun and Davis 2003). Debreceny et al. (2005) interviewed bank internal auditors and external auditors in Singapore. They noted that internal auditors tend to use CAATs for special investigations rather than as a foundation for their regular audit work. Furthermore, external

auditors did not adopt CAATs citing its inapplicability to the nature of testing the financial statement assertions or the extent or quality of computerized internal controls.

Liang et al. (2001) noted that auditors do not frequently and systematically adopt CAATs in practice and proposed a new electronic audit approach. Shaikh (2005) suggested a new CAAT based on the electronic auditing framework that includes most features of existing generalized audit software but can be designed and deployed independently from the auditee's EDP system. Finally, Zhao et al. (2004) described how CAATs must exist in order to conduct continuous auditing.

Role of CAATs in the Audit Process

Although CAATs may not be widely used in practice (Liang et al. 2001; Debreceny et al. 2005; Shaikh 2005; Curtis and Payne 2008), several researchers (i.e., Braun and Davis 2003; Zhao et al. 2004) and audit standards suggest that their usage will improve audit efficiency and effectiveness. SAS No. 99 encourages auditors to use CAATs to evaluate fraud risks, identify journal entries, and to evaluate inventory existence and completeness (2002b). The new risk standards (SAS Nos. 104-111) suggest that auditors use CAATs to select sample transactions to audit from key electronic files, sort transactions with specific characteristics, test an entire population instead of a sample, and obtain evidence about control effectiveness (AICPA 2006). Finally, standards encourage auditors to use CAATs to check the accuracy of electronic files and re-perform selected procedures such as aging of accounts receivable (AICPA 2001).

UTAUT Model

Prior accounting research has used information systems theoretical frameworks to predict acceptance (or adoption) of accounting technology (e.g., Walsh and White 2000; Bedard et al. 2003; West and Davis 2008). Several theoretical frameworks exist to predict acceptance of new

technology (i.e., Ajzen and Fishbein 1980; Bandura 1986; Davis 1989; Ajzen 1991; Moore and Benbasat 1991). We use the UTAUT (Venkatesh et al. 2003) because it incorporates elements of several prominent information systems models/theories that predict usage including technology acceptance model (TAM) (Davis 1989), theory of planned behavior (Ajzen 1991; Taylor and Todd 1995), innovation diffusion theory (Moore and Benbasat 1991), and social cognitive theory (Compeau and Higgins 1995). Furthermore, the UTAUT has been shown to explain up to 70 percent of variance in intention to use technology, outperforming each of the aforementioned specified models (Venkatesh et al. 2003).

Factors Influencing Auditor Acceptance of CAATs

UTAUT proposes that performance expectancy, effort expectancy, social influence, and facilitating conditions influence IT acceptance. *Performance expectancy* refers to 'the degree to which an individual believes that using the tool will help him or her better attain significant rewards' (Venkatesh et al. 2003, 23). For example, auditors may believe that using CAATs will assist them in meeting their audit time budget since CAATs reduce the number of hours spent conducting tests of controls and substantive testing and thereby improve audit efficiency.

Effort expectancy refers to 'the degree of ease associated with the use of the tool" (Ventakesh et al. 2003, 26). To illustrate, auditors, particularly those with significant IT training, may feel at ease using CAATs.

Social influence may be defined as 'the degree to which an individual perceives that important others believe he or she should use the new tool' (Ventakesh et al. 2003, 27). In an audit context, we expect that the degree to which auditors perceive that their direct managers support CAAT usage may influence whether they adopt CAATs.

Facilitating conditions are defined as 'the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the tool' (Venkatesh et al. 2003, 29). In an audit context, this infrastructure may involve audit firms providing appropriate CAAT resources and computer support to their employees such as specialized instruction, support center, hotline, and/or usage guidelines (Thompson et al. 1991).

METHOD

Participants

We collected data from two sources. One author attended an American Institute of Certified Public Accountants (AICPA) training seminar to obtain responses from 109 auditors employed by local, regional, and national CPA firms. We also contacted local offices of each Big 4 firm and one national firm. From these contacts, we obtained responses from 72 auditors.

As shown in Table 1, participants included 181 auditors from local, regional, national, and Big 4 firms from geographically different regions of the U.S. The respondents averaged 12.7 years of experience and their average age was 36.5 years. Participants worked for a variety of firms; 36.7 percent of participants were employed by local firms, 14.7 percent by regional firms, 17.5 percent by national firms, and 31.1 percent by Big 4 firms. The highest education level for a significant majority (82.48 percent) was a bachelors degree. Almost all of the respondents (97.25 percent) held CPA certificates. The majority of the respondents (71.0 percent) were male.

<< Insert Table 1>>

Instrument Development and Validation

Respondents completed the UTAUT questions as part of a broad field-based instrument examining audit technology and procedure usage. Given that Venkatesh et al. (2003) found that

self-efficacy and anxiety do not impact technology acceptance, we elected to exclude questions regarding self-efficacy and anxiety from our field-based instrument due to parsimony concerns.

To increase construct validity (Cook and Campbell 1979; Shadish et al. 2002), we conducted two rounds of pilot testing. First, four researchers with significant audit and systems knowledge examined the case instrument. The revised instrument was then pilot tested with eight auditors from four firms varying in size from Big 4, national, regional, to local firms. The average audit experience for pilot study participants was 5.4 years.

Independent Variables

Following Venkatesh et al. (2003), respondents answered four questions each regarding performance expectancy, effort expectancy, and social influence. In addition, respondents answered three questions related to facilitating conditions.[2] The responses to these questions were subsequently combined using factor analysis.

Dependent Variables

We used two measures of CAAT usage for each respondent. First, respondents were asked to select one audit they performed within the past year for a client with highly computerized transaction and financial reporting systems and indicate whether or not each of nine individual CAATs suggested by recent audit standards was used on that audit.[3] Aggregate client demographics indicate that selected client asset size varies greatly with the average

[2] Our respondents were employed by diverse size audit firms (i.e., Big 4, national, regional, and local). Thus, we excluded Venkatesh et al. (2003)'s third question regarding facilitating conditions (i.e., CAATs are not compatible with other systems I use) since 'other systems' may be interpreted differently by auditors from different sized firms.

[3] Pilot tests indicated that due to the wide diversity of client IT, participants had difficulty identifying specific CAAT usage for their *typical* client. Therefore, we asked participants to select one client with highly computerized systems and indicate if they used each CAAT for that *selected* client. Despite the wide diversity of client IT, pilot test participants had significantly less difficulty rating CAAT importance for their *typical* client. Thus, we asked participants to rank CAAT importance for their *typical* client with highly computerized systems.

reported at $1.8 billion in assets.[4] On average, participants rated the IT complexity for their selected client as 5.3 on the seven-point scale where 1 = manual processing and 7 = highly computerized financial reporting system. We totaled the number of CAATs used on the *selected* audit for each individual and refer to this measure as TotalCAATUsage.

Respondents were also asked to indicate the importance of each CAAT for their *typical* audit of a client with highly computerized transaction and financial reporting systems. In our regression analysis, we refer to the average importance rating over the nine CAATS used on a *typical* audit for each respondent as AverageCAATImportance.

RESULTS

Descriptive Statistics

As reported in Xxxx (2008) and reproduced in Table 2, usage for nine different CAATs suggested by recent audit standards is relatively low ranging from 28 percent of respondents who used CAATs to evaluate fraud risks to 49 percent of respondents who used CAATs to select sample transactions from key electronic files. Furthermore, the mean importance rating respondents assigned to each CAAT on a scale with 1 = not important and 7 = important ranged from 3.10 for CAATs used to test an entire population rather than a sample to 3.81 for CAATs which select sample transactions from key electronic files.

<< Insert Table 2 here >>

We collected responses to 15 items from the UTAUT designed to predict auditor usage of CAATs. Mean predictor variables, shown in Table 3, suggest that respondents assigned higher mean ratings to performance expectancy (4.09) and facilitating condition (4.16) than to effort expectancy (3.67) and social influence (3.80).

<< Insert Table 3 here >>

[4] As expected, client asset size is statistically significantly correlated with firm size ($r = 0.52$; $p < 0.0001$).

Our factor analysis involved a three step process. First, an exploratory factor analysis was performed to identify the strength of factor loadings and the potential cross-loading of individual questions on multiple constructs (see Table 4, Panel A). Second, a confirmatory factor analysis was performed to validate construct development with the underlying theoretical expectations (see Table 4, Panel B). Third, scale reliability was determined based on the Cronbach alpha. Results indicated that Cronbach alpha reliability coefficients met the 0.70 threshold for acceptability (Nunnaly 1978) ranging from 0.88 for facilitating conditions construct to 0.96 for effort expectancy construct.

<< Insert Table 4 here >>

Our direct effects model is defined as: TotalCAATUsage / AverageCAATImportance = f(Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)). In the first model, we examine the effects of four constructs from UTAUT on auditor usage of CAATs (TotalCAAT Usage). In the second model, we examine the effects of these four constructs on how auditors rate CAAT importance (AverageCAATImportance). In both models, performance expectancy (PE) represents the degree to which a participant believes that using CAATS will help him/her better attain significant rewards. Effort expectancy (EE) refers to the degree of ease a participant associates with using CAATs. Social influence (SI) represents the degree to which a participant perceives that important individuals such as audit firm management believe he/she should use CAATs. Finally, facilitating conditions (FC) refers to the degree to which a participant believes the audit firm has the organizational and technical infrastructure to support use of CAATs. As shown in Table 4, Panel A, factor loadings for each construct in both models (i.e., dependent variable = TotalCAATUsage or AverageCAATImportance) exceeded 0.50 for all items except one performance expectancy

response and one social influence response. The four factors explained the majority of the variation in responses. Further, as shown in Table 4, Panel B, the scale reliabilities were high for performance expectancy (0.90), effort expectancy (0.96), social influence (0.91), and facilitating conditions (0.88).

Prediction Model

As discussed previously in the context of our factor analysis, the overall prediction model for our dependent variables (i.e., TotalCAATUsage and AverageCAATImportance) suggests that TotalCAATUsage (AverageCAATImportance) is a function of performance expectancy, effort expectancy, social influence, and facilitating conditions. As shown in Table 5, performance expectancy is significant at the $p < 0.05$ level for both models. Furthermore, facilitating conditions is significant at the $p < 0.01$ level for TotalCAATUsage and at the $p < 0.05$ level for AverageCAATImportance. Both models have statistically significant overall F-values. Model 1 (i.e., TotalCAATUsage) has an adjusted R^2 of 37.9 percent. Model 2 (i.e., AverageCAATImportance) has an adjusted R^2 of 42.9 percent.

<< Insert Table 5 here >>

Additional Analysis

Prior research indicates that IT usage varies by gender and age (Morris and Venkatesh 2000; Venkatesh and Morris 2000). For example, men tend to adopt IT more often when they perceive it to be useful to their jobs. In contrast, perceptions of ease of use and subjective norms are more likely to drive women's IT adoption (Venkatesh and Morris 2000). Younger workers are more likely to be influenced by attitude toward using technology whereas older workers are more strongly influenced by subjective norms and perceived behavioral control (Morris and Venkatesh 2000). Furthermore, prior research suggests that firm size may influence CAAT usage

as larger firms are more likely to have resources available for CAAT training and support (Janvrin et al. 2009). To examine whether gender, age, or firm size impact our results, we added these variables as covariates to the models shown in Table 5. Results indicated that gender and age were not significant determinants of CAAT acceptance for either dependent variable (i.e., TotalCAATUsage or AverageCAATImportance). However, firm size was statistically significant for both TotalCAATUsage (p value = 0.01) and AverageCAATImportance (p value = 0.0002). Contrast analysis indicates that auditors employed by Big 4 firms are more likely to rate performance expectancy and facilitating conditions higher than those employed by smaller firms (F value = 7.99, p = 0.0053 for TotalCAATUsage and F value = 9.02, p = 0.0031 for AverageCAAT Importance).

DISCUSSION AND IMPLICATIONS

Despite the rapid growth of IT in business today and encouragement from regulators, prior research suggests that CAAT adoption by individual auditors remains relatively low (Liang et al. 2001; Kalaba 2002; Debreceny et al. 2005; Curtis and Payne 2008). CAAT usage is important since CAATs may increase audit effectiveness and efficiency (Winogard et al. 2000; Manson et al. 2001; Bell et al. 2002; Braun and Davis 2003). To obtain an understanding of factors that may impact auditor acceptance, we employed a recent technology acceptance model, UTAUT, from information systems research with data obtained from 181 auditors representing Big 4, national, regional, and local firms.

Results indicate that performance expectancy and facilitating conditions may increase the likelihood that auditors will use CAATs. Prior research suggests that training can be more effectively designed and targeted to particular user groups if the mechanisms of user acceptance are better understood (e.g., Venkatesh and Davis 1996; Bedard et al. 2003). Our findings indicate

that developing training programs to increase auditors' degree of ease using CAATs may increase CAAT usage. Furthermore, our results may encourage audit firm management to invest in additional organizational and technical infrastructure supporting CAATs particularly for auditors that are less inclined to adopt new systems to increase CAAT usage.

Our findings indicate that in our current sample, auditors employed by Big 4 firms are more likely to rate performance expectancy and facilitate conditions higher than those employed by smaller firms. Several factors may contribute to this result. First, auditors employed by Big 4 firms are more likely to audit larger clients who possess more complex IT and thus drive CAAT usage. Second, Big 4 audit firms have more resources available to them to respond to current developments and clients' needs (Palmrose 1986; Gist and Davidson 1999). Our findings, together with the recent growth opportunities for national, regional, and local audit firms due to Sarbanes-Oxley Act of 2002 (Accounting Office Management and Administration Report 2005; Dennis 2005; Rozycki 2005) and an increase in Big 4 firms 'firing' risky clients who turn to non-Big 4 firms to be their auditors (Cheney 2004) may encourage smaller audit firms to expend more resources on CAAT acceptance.

Our results must be interpreted in light of certain limitations. First, UTAUT examines technology from the time of their initial introduction to stages of greater experience (Venkatesh et al. 2003). We examine retrospective responses since we measure perceptions after the participants' acceptance or rejection decision rather than during the active adoption decision-making process (Venkatesh et al. 2003, 13). Second, due to data limitations, we asked auditors to self-report the extent of their CAAT usage. To increase construct validity, a better proxy may be actual system usage (Straub et al. 1995; Devaraj and Kohli 2003; Venkatesh et al. 2003). Future research could examine actual system usage. Third, IT usage acceptance research in MIS

generally examines voluntary usage contexts. Venkatesh et al. caution that voluntary usage results may not generalize to mandatory usage settings (2003, 13). The mean response from our respondents to the statement, 'I have the freedom to choose what technology I will use' was 3.86 on a seven point scale where the endpoints are 1 = strongly disagree and 7 = strongly agree. This provides modest evidence that our respondents did not perceive significant pressure from firm management to adopt CAATs. Additional research could investigate whether our findings differ in settings where voluntary versus mandatory usage was more distinct.

Despite these limitations, our results provide important insights into how auditors currently use CAATs for both researchers and practitioners. Given auditors' slower than expected acceptance of CAATs, identifying the drivers of CAATs acceptance helps researchers and practitioners to design training, marketing, and infrastructure support to encourage CAAT acceptance. Second, this study provides insights for standard setters regarding auditors' CAAT usage, as well as whether or not auditors may be in compliance with audit standards. Third, this study presents practitioners with ideas on how to improve their CAAT acceptance rates.

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TABLE 1
Participant Demographics

	Frequencies	Mean or Percent (Std. Dev.)
Years as an external auditor[a]		12.7 (9.4)
Age[a]		36.5 (10.0)
Highest education level[a]		
Bachelor degree	149	82.8%
Master degree	29	16.1%
Coursework beyond master degree	2	1.1%
Certification[a, b]		
Certified internal auditor	1	
Certified public accountant	156	
Certified information systems auditor	0	
Certified management accountant	1	
Certified financial executive	8	
Certified financial planner	0	
Other certification	1	
Gender[a]	M = 127	71.0%
	F = 52	29.0%
Audit firm size[a]		
Big 4	55	31.1%
National	31	17.5%
Regional	26	14.7%
Local	65	36.7%
IT expertise[a]		
Novice	30	16.7%
Intermediate	127	70.5%
Expert	23	12.8 %

[a]One or more participants did not answer question.

[b]Participants could list more than one certification.

TABLE 2[a]
CAAT Usage Percentage in *Selected* Client
and Perceived Importance Means in *Typical* Client
n = 181

CAAT	Reference in Standard	Usage in *Selected* Client Number	Usage in *Selected* Client %[b]	Importance in *Typical* Client[c] (Std Dev)
• evaluate fraud risks (FraudCAAT)	AU 316.52	Yes = 36 No = 93	27.91	3.18 (2.49)
• identify journal entries and other adjustments to be tested (JECAAT)	AU 316.64	Yes = 46 No = 83	35.66	3.43 (2.56)
• check accuracy of electronic files (AccCAAT)	AU 308.33	Yes = 59 No = 69	46.09	3.79 (2.49)
• re-perform procedures (i.e., aging of accounts receivable, etc) (RePerfCAAT)	AU 308.34	Yes = 46 No = 82	35.94	3.40 (2.40)
• select sample transactions from key electronic files (SampleCAAT)	AU 327.19	Yes = 63 No = 65	49.22	3.81 (2.52)
• sort transactions with specific characteristics (SortCAAT)	AU 327.19	Yes = 59 No = 69	46.09	3.80 (2.52)
• test an entire population instead of a sample (PopCAAT)	AU 327.19, AU 327.61	Yes = 39 No = 88	30.71	3.10 (2.41)
• obtain evidence about control effectiveness (ContEffCAAT)	AU 327.27	Yes = 39 No = 90	30.23	3.18 (2.42)
• evaluate inventory existence and completeness (InvCAAT)	AU 316.54	Yes = 47 No = 80	37.01	3.47 (2.60)

[a] Source of table is Xxxx (2008).

[b] Percent of participants who used CAAT when auditing a *selected* client with highly computerized transactions and financial reporting systems in the past year.

[c] Participants rated the importance of each CAAT for their audit of a *typical* client with highly computerized transaction and financial reporting system on a scale of 1 (not important) to 7 (very important).

TABLE 3
Predictor Variable Means
n = 181

Predictor Variable		Mean[a]	Std Dev	Cronbach Alpha
PE1	I find computer assisted auditing techniques (CAATs) useful in my job.	4.66	1.94	0.84
PE2	Using CAATs enables me to accomplish tasks more quickly.	4.48	1.97	0.82
PE3	Using CAATs increases my productivity.	4.48	1.90	0.81
PE4	If I use CAATs, I will increase my chances of getting a raise.	2.76	1.86	0.97
Average Performance Expectancy		**4.09**	**1.67**	
EE1	My interaction with CAATs is clear and understandable.	3.64	1.73	0.97
EE2	It is easy for me to become skillful at using CAATs.	3.79	1.79	0.95
EE3	I find CAATs easy to use.	3.56	1.73	0.93
EE4	Learning to operate CAATs is easy for me.	3.71	1.79	0.94
Average Effort Expectancy		**3.67**	**1.66**	
SI1	People who influence my behavior think that I should use CAATs.	3.71	2.00	0.86
SI2	People who are important to me think that I should use CAATs.	3.70	1.98	0.86
SI3	Our firm senior managers have been helpful in the use of CAATs.	3.39	1.97	0.89
SI4	In general, our firm has supported the use of CAATs.	4.41	1.98	0.92
Average Social Influence		**3.80**	**1.76**	
FC1	I have the resources necessary to use CAATs.	4.29	1.92	0.75
FC2	I have the knowledge necessary to use CAATs.	3.98	1.88	0.84
FC3	A specific person (or group) is available for assistance with CAATs difficulties.	4.20	2.26	.090
Average Facilitating Conditions		**4.16**	**1.82**	

[a] Participants were asked to indicate the extent to which they agreed from 1 (strongly disagree) to 7 (strongly agree) with each statement.

TABLE 4
Factor Analysis

Panel A: Factor loadings from exploratory factor analysis

	Direct effects			
Survey Items (see Table 3)	**PE**	**EE**	**SI**	**FC**
PE1	0.828			
PE2	0.956			
PE3	0.940			
PE4	0.231			
EE1		0.73		
EE2		0.84		
EE3		0.96		
EE4		0.91		
SI1			0.95	
SI2			0.95	
SI3			0.54	
SI4			0.40	
FC1				0.99
FC2				0.67
FC3				0.53
Eigenvalues	104.52	21.93	9.38	5.78
Percent explained	73.80	15.49	6.63	4.08
Cummulative percent explained	73.80	89.29	95.92	100.00

TABLE 4
Factor Analysis (continued)

Panel B: Factor reliability and cross-factor correlations for the confirmatory factor analysis

	Alpha[a]	Mean	SD	TotalCAATUsage	AverageCAAT Importance	PE	EE	SI
TotalCAATUsage[b]		0.43	0.37					
AverageCAATImportance		3.89	2.00	0.63				
PE	0.90	4.09	1.67	0.54	0.49			
EE	0.96	3.67	1.66	0.50	0.44	0.82		
SI	0.91	3.80	1.76	0.54	0.46	0.71	0.66	
FC	0.88	4.16	1.82	0.58	0.50	0.66	0.71	0.72

[a] Alpha column reports the Cronbach alpha reliability score for each construct.

[b] Each construct was extracted using factor analysis. We used oblique minimization to obtain a rotated factor solution. The final constructs are defined as follows:

TotalCAATUsage:	TotalCAATUsage – Number of CAATS participant indicated he/she used when auditing a selected client with highly computerized financial reporting systems during the prior year.
AverageCAATImportance	AverageCAATImportance – Average importance rating participant gave nine CAATs when auditing a typical client with highly computerized financial reporting systems.
PE:	Performance expectancy – The degree to which participant believes that using CAATs. will help him/her better attain significant rewards.
EE:	Effort expectancy – The degree of ease participant associates with using CAATs.
SI:	Social Influence – The degree to which participant perceives that important others believe he/she should use CAATs.
FC:	Facilitating conditions – The degree to which participant believes that the organizational and technical infrastructure exists to support use of CAATs.

TABLE 5
Use of CAAT: Regression Results

			Model 1 TotalCAATUsage			Model 2 AverageCAATImportance		
Variables	**Coef**	**Expected Sign**	**β**	**p- value**	**Sig**	**β**	**p- value**	**Sig**
Intercept	β_0		-0.18			0.93		
Performance Expectancy (PE)	β_1	+	0.05	2.00	*	0.34	2.22	*
Effort Expectancy (EE)	β_2	+	-0.01	-0.40		-0.03	-0.18	
Social Influence (SI)	β_3	+	0.03	1.51		0.11	0.92	
Facilitating Conditions (FC)	β_4	+	0.07	3.43	**	0.30	2.52	*
F-value				24.59			17.66	
p-value				< 0.0001			< 0.0001	
Adjusted R^2 (%)				37.9			42.9	

Model specifications:
Model 1: TotalCAATUsage $= \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 SI + \beta_4 FC$
Model 2: AverageCAATImportance $= \beta_0 + \beta_1 PE + \beta_2 EE + \beta_3 SI + \beta_4 FC$

Significance:
* Significant at p-value < 0.05
** Significant at p-value < 0.01