Use of Generalized Audit Software (GAS) as a CAAT Tool

Computer Assisted Audit Techniques (CAATs) encompass a range of computerized tools and procedures that are used by auditors in various phases of the financial statement audit and by internal auditors in a wide range of operational and special audits (Boritz 2002; ISACA 1998; Rittenberg and Schwieger 2003, 321-346). Generalized Audit Software (GAS) is a class of CAATs that allows auditors to undertake data extraction, querying, manipulation, summarization and analytical tasks (Boritz 2003). A number of publications and guidance by professional bodies (CICA 1994; EDP Auditors Foundation 1992), audit standards setters (AASB 2001, 2004; IAASB 2003b; ISACA 1998) and regulatory agencies (FFIEC 2003) demonstrate the importance of CAATs and GAS in the conduct of audits. Following the passage of the Sarbanes-Oxley Act in the USA, there has been increased interest in the formal testing of internal controls and recognition of the vital role of information technology in maintaining such controls (ITGI 2004; Stevens 2004). Indeed it is difficult to imagine that the tests described by the Public Company Accounting Oversight Board (PCAOB) in its Auditing Standard No. 2 on the audit of internal controls could be conducted without the benefit of CAATs, GAS or other automated audit support (PCAOB 2004). CAATs and GAS have also been identified as important prerequisites in the building of continuous audit capabilities (Rezaee et al. 2002).

Interestingly, there has been little or no formal research on the application of CAATs in general and GAS in particular to the assurance process (Boritz 2002). This study aims to make a first step in filling this clear gap in the research literature. The study seeks to evaluate the nature and extent of the utilization of GAS in financial institutions. These economically significant entities typically make intensive use of information systems for many business processes. Many financial institutions are of a sufficient size to warrant investment in GAS by internal or external auditors. Financial institutions also are often subject to regulatory regimes that require monitoring of particular risks and potential malfeasance in areas such as money laundering. In particular, this study aims to establish how GAS assists internal auditors within banks and their external auditors in the process of substantive testing in the conduct of both financial statement audits as well as special audits. Second, in the event that banks do not make use of GAS to obtain audit evidence through substantive procedures, the second objective of this study is to examine the reasons for such limited usage. In addition, this study also attempts to examine the possibilities of how banks’ internal and external auditors would be able to better exploit GAS if they were given an opportunity to exploit their capabilities to the fullest.

Given the highly limited base of research on GAS in the financial services sector or other industry, we conduct exploratory qualitative research. We conduct depth interviews with both internal and external auditors. We find that the extent and range of use of GAS varies
widely between the institutions in our sample. Internal auditors see GAS primarily as a tool for special investigations rather than We establish that external auditors make no use of GAS, citing the inapplicability of this class of tool to the nature of testing the financial statement assertions or the extent or quality of computerized internal controls maintained by the bank. While the sample size for this study is small and only one, albeit significant, industry is chosen we believe that this study opens up a range of research opportunities and questions. We found considerable variation in both overall usage of the tool and in the nature of the tasks undertaken. We found little evidence that GAS is embedded in the day to day work of the internal auditor and no evidence for the external auditor. Survey, case study, focus group and Delphi studies may all be appropriate as this area of research is moved forward. This paper is organized as follows. The next section covers the background of the nature of GAS and CAATs; introduces the nature of bank audits in a highly intensive computerized information system environment and explores the findings of the limited prior research on GAS and CAATs. This background leads to the development of the three research questions. The third section presents a descriptive analysis of the methods used in this study, while the fourth section provides the detailed findings from the interviews with auditors with respect to each of research question. The final section summarizes the study and presents a set of conclusions, provides implications for future research and sets out the limitations of the research.

Computer Assisted Audit Techniques (CAATs) and Generalized Audit Software (GAS)

CAATs are ‘techniques that use the computer as an audit tool’ which are utilized in application of auditing procedures (Braun and Davis 2003; IAASB 2003b, ISACA 1998). CAATs include tools that range from basic word processing to expert systems. Computerized audit techniques range from procedures as simple as listing the data in a given file to the use of Artificial Intelligence tools to predict financial failure or financial statement structures. For instance, general productivity software such as Microsoft Word, MS Excel and MS Access can be used to support audit work including text processing, spreadsheet analysis and graphics. MS Access and other general purpose databases and data analysis tools including Oracle, Statistical Analysis Software (SAS), Structured Query Language (SQL), Crystal Report and PowerBuilder can be used as forms of generalized retrieval software (GRS) or for more sophisticated data analysis tools. Embedded Audit Modules (EAMs) are a class of CAATs that are integrated within the entity’s application systems and which support real time or quasi-realtime monitoring of transactions within the accounting information system (Debreceny et al. 2003; Groomer and Murthy 2003). Arguably the most widely deployed class of CAATs is Generalized Audit Software (GAS). These packages are computer programs that contain general modules to read existing computer files and perform sophisticated manipulations of data contained in the files to accomplish audit tasks. They have a user-friendly interface that captures users’ audit
requirements and translates those user instructions or queries into program code. This is undertaken by interrogating the client’s file systems or database and performing the necessary program steps. As compared to embedded audit modules, they do not require a certain level of programming expertise to design and implement the audit queries. GAS is normally deployed in an ad-hoc rather than realtime fashion (Braun and Davis 2003). In addition, GAS do not require test decks, advanced programming techniques, development of audit-specific applications, each of which can be costly. In summary, the reason for the widespread knowledge and their adaptability to a variety of environment and users. GAS vendors also provide data extraction routines for many different computing environments, meaning that auditors’ investment in learning the software can be recovered by utilizing the software in many different production and application software environments. Currently, the latest versions of GAS include the Audit Command Language (ACL), Interactive Data Extraction and Analysis (IDEA) and Panaudit Plus. Each of these GAS packages operates in the personal computer environment. Auditors can interrogate mainframe and networked applications across the firm’s local area network. GAS focuses on the fully exploiting the data available in the entity’s application systems in the pursuit of audit objectives. GAS support auditors by allowing them to examine the entity’s data easily, flexibly, independently and interactively in what Coderre (1998, 17) refers to as data-based auditing. Using GAS, an auditor can formulate a range of alternative hypotheses for a particular potential misstatement in the subject matter and then test those hypotheses immediately. “What if” scenarios can be developed with the results and the auditors can examine the generated report rapidly.

Nature of Banking Risk and Implications

For External and Internal Audit

The focus of this study is on the use of GAS and CAATS within banks. A bank is a type of financial institution whose principal activity is the taking of deposits and borrowings for the purpose of lending and investing. Banks have certain characteristics that distinguish them from most other commercial enterprises (De Lucia and Peters 1993; IAASB 2003a; Rose and Hudgins 2004; Van Greuning and Bratanovic 2003). These characteristics include their custody of large amounts of monetary items, including cash and negotiable instruments. The value of assets owned by banks can change rapidly and are often difficult to determine. Banks are highly geared with a high proportion of external debt in relation to owners’ capital contribution. Banks usually perform a wide variety of significant value transactions as part of their daily activities. Transactions, for example online banking, can often be directly initiated and completed by customers without any intervention from the banks’ employees.
Audit implication of banking risk

The following discusses the classes of key assertions that auditors are concerned with in the banking industry (Kaufman 1996). Banks have: A low capital-to-assets ratio that increases banks’ vulnerability to adverse economic events and increases the risk of failure. Auditors would particularly examine the liabilities of the banks’ balance sheets in order to ascertain the banks’ ability to repay the debts when they fall due. The tests of the completeness assertion are also particularly important in respect of liabilities. A low cash-to-assets ratio that may require the sale of earning assets in order to meet deposit obligations. This would require the auditors to look into the liquidity risk of the banks. Banks must have a portfolio of assets or investments that are both long and short term in nature. Short-term assets, which are usually more liquid, can be sold off as soon as possible without a significant decline in their value. High demand debt and short-term debt-to-total debt (deposits) ratio, which may result in hurried asset sales of opaque and non-liquid earning assets with potentially large fire-sale losses to pay off depositors. Therefore, auditors would have to ensure that activities that could damage a bank reputation and which might lead to rush on the bank’s deposit base are minimized. Two examples are the involvement in the illegal activities such as money laundering and the attempt to cover up losses by the management.

Use of Information Technology by Banks

The high volume of transactions and the short time period in which the transactions must be processed, result in the extensive use of IT in the bank industry. This results in near total reliance on the records maintained and the reports produced by the IT systems. They represent the only readily accessible source of detailed and up-to-date information on the banks’ assets and liability positions (IAASB 2003a). This matter is of particular concern to auditors. The audit trail is electronic, making it potentially difficult to trace audit evidence. Business processes and accounting allocations are often embedded in software routines, rather than as the result of conscious decisions by operational management or accountants. Therefore, the auditor must understand the application of technology in order to identify the risk factors of the banks. These risk factors will subsequently have a direct impact on the audit procedures. The auditors would have to focus their attention on the internal control systems and test the systems for accuracy and completeness of the banking operations (Coderre 1996, 1998). Further, information systems not only bear on the financial reporting systems but also on systems that generate data for regulatory compliance and related issues such as fraud detection (Gerson 2004). CAATs/GAS can aid in performing substantive tests in banks to obtain audit evidence. Prior research has identified that CAATs/GAS help to improve effectiveness and efficiency of an audit (Braun and Davis 2003; Coderre 1998; Gascoyne 1992; IAASB 2003b). Auditors can use GAS to help detect material misstatements in the financial statements, particularly in substantive
tests of details of transactions and balances as part of meeting the general audit objectives of validity, completeness, ownership, valuation, accuracy, classification and disclosure of the data produced by the accounting system to support the financial assertions (Knechel 2001). Table 1 shows the set of management assertions, the relevant audit objective, an example of a relevant account in the banking environment and whether or not GAS might be able to be used to further the particular audit objective.

To address the assertions discussed above, auditors may perform procedures such as inspection, observation, inquiry and confirmation, computation and analytical procedures. In the context of the audit of a bank’s financial statements, all the procedures mentioned, except observation, require particular attention to the bank’s computerized information systems. These procedures present the auditors the opportunity to use GAS to obtain the audit evidence. However, as Table 1 presents, GAS can only be used in limited instances to assist in gathering the audit evidence with respect to each audit objective. Some of the tasks that GAS can perform to facilitate the audit procedures include verifying extensions and footings; re-performing a variety of calculations; exception reporting and identifying unusual transactions; comparing; summarizing or re-sequence data and performing analysis; duplicating detection; aging analysis of accounts like loans receivables; performing the calculations and comparisons of data lying on separate files used in analytical procedures; selecting audit samples for tests of transactions; preparing and printing confirmation requests, reports or letters (CICA 1994; Gascoyne 1992). Therefore, with these functions, auditors can perform substantive tests within a shorter time frame resulting in overall efficiency yet not compromising on the quality of audit effort.