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An empirical investigation of the use of ISA 520 "analytical procedures" among Big 4 versus non-Big 4 audit firms in Egypt

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Abstract

Purpose – This study aims to examine the International Standards on Auditing (ISA) number 520 relating to analytical procedures (APs) and adapt relevant aspects of prior studies on APs to the Egyptian audit context. The study investigates the extent of use of APs in Egypt during the three main stages of an audit by size of firms and level of staff. It examines auditors' perceptions of the frequency and effectiveness of different types of APs in achieving a selected set of audit objectives. The study also identifies the types of assurance provided by APs and their influence on detailed testing as well as analyzing the role of auditing standards in the context of the use of APs.

Design/methodology/approach – The design and research method are empirical using a questionnaire survey to collect information on actual uses of APs from 14 audit firms in Egypt which audit the 100 actively traded companies on the Egyptian Stock Exchange (EGX) as measured by the EGX 100 index. The survey was carried out between 2008 and 2009.

Findings – The results of the study showed relatively low use of APs by Egyptian auditors with wide variations in its use by Big 4 and other auditing firms. Auditors from Big 4 firms are found to use APs to a greater extent than auditors from non-Big 4 firms. Also, the reliance on APs tends to differ by auditors rank and position. The majority of auditors consider APs useful in achieving audit objectives. Audit firms of all size continue to emphasize judgment-based compared to quantitatively based procedures. The results also indicated a lack of confidence in the use of APs as substantive procedures. Finally, the study confirmed prior research findings in that auditing standards are regarded as most effective in codifying existing large firms practice. It was found that ISA 520 has been least effective in stimulating change in the Egyptian audit practice.

Research limitations/implications – The different economic, political, educational, and culture environment in Egypt may restrict the generalisability of this study results.

Practical implications – In order to increase the use of APs by Egyptian auditors in the various stages of the audit engagement, auditors need to understand the requirements of the Egyptian Auditing Standards regarding their use. Auditors also need to be aware of the application of various APs techniques, especially those associated with statistics and mathematical models. Educational institutions and the Egyptian Association of Accountants and Auditors must play significant role in educating auditors about APs techniques and their use in planning, testing and final review of the financial statements.

Originality/value – This paper contributes to an understanding of the nature and uses of APs within the Egyptian culture and economic context. The study will stimulate further research in understanding the importance of the use of APs in audit engagements in different perspectives.

Keywords Auditing, Auditing guidelines, External auditing, Auditing standards, International standards, Egypt

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1. Introduction

In a competitive audit environment, practicing auditors perform audit tests more extensively to discover material errors in a client's financial reports (Law and Willett, 2004). Analytical procedures (APs), as one of the audit tools, are considered useful to detect significant proportion of material errors at the early phases of an audit engagement (Hylas and Ashton, 1982). Professional bodies recommend auditors to use APs during the planning and final review phases of the audit as an important substantive test (American Institute of Certified Public Accountants (AICPA, 1988); APC, 1995; Institute of Chartered Accountants in Australia, 1995).

APs as an auditing technique has attracted, in recent years the interest of practitioners, academics and standard-setting bodies. This was partly due to auditors search for appropriate ways of reducing audit costs without sacrificing the high quality of audit services (Mahathevan, 1997). With audit engagements often being completed under restrictions of time, cost, and concern for audit ease, there often arises the need for APs to improve audit effectiveness and efficiency (Albrecht, 1977; Hylas and Ashton, 1982; Blocher and Willingham, 1988; Calderon and Green, 1994; Mahathevan, 1997; Cho and Lew, 2000; Asare and Wright, 2001). In particular, they are relatively low-cost procedures which have the ability to reveal unusual trends, improve overall efficiency by replacing more time-consuming procedures, and even assist in the detection of fraud and error (Blocher and Willingham, 1988; Calderon and Green, 1994; Mahathevan, 1997).

Another reason for the use of APs in auditing is the introduction and application of risk-based auditing. This newly developed audit concept requires the assessment by auditors of the different types of audit and business risks during the various phases of the audit engagements. The tools associated with AP use provide important means by which auditors may assess operational, financial, administrative, and other internal and external risks. Auditors perform such analysis during the planning, testing and review stages of the audit. Without auditors' knowledge of APs and its techniques, the objectives of risk-based audit approach might not be achieved affectively and efficiently, resulting in a significant increase in audit costs, time, and efforts.

With the tendency in practice towards increasing reliance on APs, it is vital that auditors are skillful in completing such tests. In this context, it is argued by Asare and Wright (2001, p. 205) that "research to understand and improve auditors' performance of AP is important". Furthermore, it is argued by Cho and Lew (2000, p. 431) that:

> While AP is conceptually applicable to all stages of an audit, there remains not too much international documentation of the relative extent of applications for inter-environmental comparison [. . .]. The practice of analytical review is necessarily influenced by environmental factors. Each environment has its own unique features and empirical AP issues must, therefore, be resolved on its own merits.

Many studies on auditors' use and perception of APs have been conducted in the USA (Tabor and Willis, 1985; Ameen and Strawser, 1994; McDaniel and Simmons, 2007), the UK (Fraser *et al.*, 1997; Mulligan and Inkster, 1999), Canada (Smith, 1983; Lin and Fraser, 2003), Singapore (Mahathevan, 1997), Hong Kong (Cho and Lew, 2000), and Australia (Booth and Simnett, 1991). Considering a lack of similar studies in Egypt, with its unique professional and economic environment, a closer look into the use and perception of APs by local practitioners in performing different types of audit engagements is considered both timely and appropriate. Hence, this study attempts to adapt relevant aspects

of prior studies on APs to a local context providing a detailed analysis of the prevailing practice in Egypt and, in particular, between experience levels and firm types. Given the importance of international understanding of auditing standards and practice, the results of this study contribute to the literature about auditing in the Egyptian environment (Dixon *et al.*, 2006) by shedding light on whether the extent and manner of use of AP is comparable to other countries or not including in a developed nation: Canada.

There are several reasons for choosing Egypt as the selected country for this study. The first is the rapid growth of Egypt as an emerging economy with great foreign investment potential. The total amount of foreign investments reached more than US$11 billion in 2008 compared with only US$300 million five years before Cairo and Alexandria Stock Exchanges (CASE, 2006, 2009). This may require better protection of such investments. Accounting and auditing standards including the application of APs in risk-based audit approach are considered elements in the control mechanism implemented by both professional and government bodies. The second is that the business environment in Egypt experienced a dramatic reform over the past decade, as it has been dynamic, evolving through a new economic system that has led to partial convergence with the International Financial Reporting Standards (IFRSs) and setting of the Egyptian Accounting Standards (EASs). The Egyptian Institute of Directors established in 2005 prepared the first Egyptian Code of Corporate Governance which was officially issued in 2006. Also, the institute started in 2008 to provide continued professional education (CPE) covering major components of corporate governance, including activities for both internal and external auditing. Such development requires analysis of how it affects auditors discharging their responsibilities using various types of audit evidence, such as APs. Finally, the results of the current study may help researchers better understand reasons behind the continued reliance by auditors on the traditional, non-risk-based audit approach compared with the risk-based approach in developing countries.

The paper is divided into five further sections. The next section, Section 2, provides some background information about the business and professional audit environment in Egypt. Section 3 provides a brief review of literature that considers the extent of use, effectiveness, types of APs, and the role of auditing standards in stimulating change in practice. It also identifies research questions in relation to these areas to be answered in this paper. Section 4 explains the research methodology employed, followed by a description of the sample, and the measurement technique used. Section 5 presents the statistical findings and discusses the research results. Finally, the conclusion of the study, its limitations and the scope for future research, are considered in Section 6.

2. The business and professional audit environment in Egypt

2.1 The structure of the auditing profession in Egypt

Egypt is characterized by a late move towards a market economy in 1991 when Egypt undertook an ambitious economic reform and structural adjustment program, as advocated by the International Monetary Fund and World Bank (Abd-Elsalam and Weetman, 2003). Such economic reform resulted in the Egyptian auditing profession being closely modeled on those of the USA and the UK over a period of more than 25 years. Currently, there is no professional body in Egypt with the power to regulate the activities of the profession (World Bank, 2001). The Egyptian Society of Accountants

and Auditors (ESAA) plays a central role in the accounting profession. This local accounting body ESAA was established in 1946 by a royal decree, managed by a board of directors, reorganized in 1977 as a non-profit organization, and became a member of International Federation of Accountants (IFAC) in 1983. It is an association of chartered accountants that promotes the development of educational and professional standards for its approximately 1,200 members (World Bank, 2001), about 785 of whom are actively involved in auditing practice, but membership in the society is voluntary (World Bank, 2002).

The ESAA does not have the power to license accountants and auditors or to establish auditing standards, and it is often the case that external auditors are deeply involved in their client firms. This may include the preparation of financial statements (FS), the disclosure of footnote items, and even the decision-making process in relation to year-end accounts (World Bank, 2002). The ESAA does not test whether its members comply with either IFAC (2006) or local standards. However, the Capital Market Authority (CMA), a model of Securities and Exchange Commissions in the USA, assess the level of compliance by listed companies of the EASs with no penalties associated with management or auditors failing to comply with such standards. Only in rare situations, the CMA ordered the management of listed companies to modify their FS to comply with EAS.

Members of ESAA can be admitted when they satisfy one or more of the following conditions (ESAA, 2007, Cairo (Annual Report, 2007)):

(1) membership in the Institute of Chartered Accountants in England and Wales (ICAEW), or another acceptable foreign professional body;

(2) doctoral degree in accounting or auditing with three years of full-time work experience in practice; and

(3) at least three years of full-time work experience in the office of a practicing ESAA member or equivalent and successful completion of the two-part examination. (The first examination is performed after half of period and the second at the end of three years).

The Registration Committee for Accountants and Auditors in the Ministry of Finance has a list of more than 30,000 registered accountants. Registration rules require a graduate to have a bachelor's degree in accounting to register as a trainee accountant. Trainees become licensed as first-level accountants after three years of work in an accountant's office, which authorizes them to work as auditors of sole proprietorships and partnership enterprises. After an additional five years of experience, accountants obtain a final registration certificate and become licensed to act as auditors of corporations. Auditors are not required to take any qualifying examinations before registration in the accountants' registry.

Thus, the auditing profession in Egypt is divided into two groups of practicing auditors. One represents members of ESAA who are qualified and some who are members of international professional bodies such as AICPA, ACCA, and ICAEW. Auditors in this group are normally partners, managers, and audit seniors in auditing firms with international affiliations representing the top ten international CPA firms. The other group is composed of many practitioners in small- and medium-sized firms who do not possess sufficient knowledge and formal qualification of both accounting and auditing standards and perform audit examination for tax purposes only (World

Bank, 2002). Such division of the auditing profession in Egypt will have significant implications on the extent and objectives of the use of APs in the various phases of the audit engagements. This should be assessed taking into consideration that the use of APs requires technical know-how for the application of its advanced tools.

Moreover, it is observed that the audit practitioners in Egypt are not required to follow any modern code of ethics in line with IFAC code of ethics for professional accountants (The World Bank, 2002). There is no effective code of professional ethics for accountants and auditors in Egypt. This might be a result of governments in many less developed countries not undertaking strong measures to prevent and detect corruption in businesses and non-compliance acts related to various laws and regulations governing business enterprises. However, the Commercial Syndicate's Law 40/1972 discusses ethics breach criteria (such as fraud). Although the Ministry of Finance and the Syndicate have been highlighting awareness of legal requirements, some accountants and auditors ignore the code of ethics for practical performance. In practice, there is little awareness among many practitioners of international best practice concerning conflicts of interest and auditor independence (World Bank, 2002). Furthermore, the knowledge gap of practitioners is increased by the absence of the continuous education system. The ESAA has started with a learning system for its candidates registering for its own examinations.

However, most of the practicing accountants and auditors without society membership will suffer from a lack of training and proper knowledge for supporting high-quality financial reporting. With the complexity embodied in the application of some AP tools, one may expect less use of APs in small- and medium-size auditing firms managed by less qualified and well-trained auditors.

2.2 Accounting and auditing standards and compliance requirements

International auditing firm networks working in Egypt are familiar with EASs issued by ministerial decision number 503 in October 1997 (MOEFT, 1997; Samaha and Stapleton, 2009). Ministerial decision number 243 in June 2006 (MOFT, 2007) established a permanent committee to issue EASs based on full IFRSs, requiring listed companies to prepare their accounts based on EASs. This is expected to enhance the quality of information issued by listed companies. As a result, it is expected that Egyptian companies audited by one of the international auditing firm networks will apply many of the audit techniques included in the International Standards on Auditing (ISA). These include APs tools used at various stages of the audit process. In contrast, auditors in small- and medium-size CPA firms without any international affiliation do not possess the required knowledge of IFRS and ISA and therefore are not expected to understand the advantages and disadvantages, or circumstances, in which the use of APs in audit assignments may be beneficial. The Ministerial Decree 503/1997 referred to above is considered to be the first time EASs were issued. In 2008, Egypt had 35 accounting standards and six auditing standards. The Egyptian Standards on Auditing (ESA) (Ministry of Foreign Trade, 2003) deal only with the reporting issues and ignore the other areas of ISA (Navady, 2001). However, ISA should be applied in the absence of Egyptian standards.

Factors affecting the non-compliance with accounting and auditing standards as revealed by World Bank (2002) and Samaha and Stapleton (2008) include: first, ineffective control mechanisms exist for imposing sanctions on public accountants

and auditors who fail to comply with accounting and auditing standards. For example, the Egyptian Stock Exchange (EGX) does not have the necessary authority to ensure listed companies to comply with financial reporting requirements, and is incapable of applying sanctions for non-compliance with accounting standards requirements.

Moreover, the central bank does not have enforcement mechanisms to guarantee compliance with bank statutes. Second, the quality of the auditing process is influenced by assigning, or changing, auditors. Shareholders have the power to assign, or change, auditors, and to determine levels of auditors' compensation, but in practice, management makes these decisions. This practice forces auditors to comply with the wishes of top management, which affects the level of compliance with accounting and auditing standards. For example, an auditor may be forced to change an opinion to retain the auditee, although this behavior is against professional ethics and due care.

3. Literature review and research questions

In the USA, Statement on Auditing Standards (SAS) No. 56 (AICPA, 1988) increases significantly the scope of APs from the earlier SAS No. 23 (AICPA, 1978). It requires APs to be used during audit planning and final review, provides greater specificity about the role of APs at each stage of the audit, and identifies criteria to be applied by auditors when selecting and evaluating APs (Blocher and Loebbecke, 1992). In addition, the Auditing Standards Board issued an exposure draft to amend SAS No. 56 by requiring specific documentation when APs are used as the principal substantive test of a significant FS assertion (AICPA, 2001). In 1995, the Auditing Practices Board (APB) in the UK issued SAS No. 410 (APB, 1995), which mandated the use of APs during the planning and final review phases of the audit, in a similar approach to SAS No. 56 (AICPA, 1988). Neither SAS No. 56 nor SAS No. 410, however, specifies the extent of APs required or sets limits to the reliance that may be placed on them. The Canadian standard now parallels, in many important aspects, the corresponding standards in both the UK and the USA (Lin and Fraser, 2003).

At the time this study was conducted, the ESAs were not in effect. As such, the research instrument used in this study was based on ISA 520 pertaining to APs, because as mentioned earlier, the ISA are applied in the absence of ESA. Hence, this paper will make reference to the ISAs. ISA 520 deals with APs as:

- risk-assessment procedures to obtain an understanding of the entity and its environment;
- substantive procedures in response to assessed risks; and
- procedures that assist in forming the auditor's overall conclusion on the FS.

3.1 Extent of use of APs

During the planning stage, APs are used as attention-directing devices to identify the existence of unusual transactions, events, amounts, ratios, and trends which may indicate the need for further investigation (Kinney and Felix, 1980; Blocher and Willingham, 1988; Mancuso, 1992; Mahathevan, 1997; ISA 520, Cho and Lew, 2000). Biggs (1982) took the position that audits of the future would rely more on inquiry, observation, and analysis and away from inspecting documents, thus hypothesizing an expanded role for ARs. This prediction reflected the reality in a number of studies (Burton and Fairfield, 1982; Smith, 1983; Holder, 1983; Tabor and Willis, 1985;

Turley and Cooper, 1991; Ameen and Strawser, 1994; Fraser *et al.*, 1997; Mahathevan, 1997; Mulligan and Inkster, 1999; Cho and Lew, 2000; Lin and Fraser, 2003; Omura and Willett, 2006; McDaniel and Simmons, 2007).

The above studies clearly suggest that the use of analytical review is a function of other factors such as size, nature of accounts being tested and available resources of the audit firm as well as the experience and perception of auditors. Moreover, business analytics software can play a significant role in assisting auditors in performing preliminary AR in the risk-based audit approach with its related risk-assessment process including risk of material errors, going concern and financial distress and possible management fraud (KosKivaara, 2004; Vuchnich, 2008). These analytics may be used for identifying both inherent and control risk. Auditors would identify flags for an inherent revenue recognition risk, such as bill and hold scheme, and as a risk of ineffective internal controls over cutoff procedures (Vuchnich, 2008).

In the detailed testing phase, APs may improve the overall efficiency of the audit by replacing relatively more time-consuming procedures. It may also enhance audit effectiveness. Fleming and Wortmann (2005) indicated that the more disaggregated (by month, by customer, by location and by product line) and non-financial the analytical relationship is, the more effective the analytical results. McDaniel and Simmons (2007) supported the previous findings and added that auditors assess precision lower for the less predictable account (i.e. allowance for loan losses) versus the more predictable account (i.e. interest income). They explained that current standards about APs provide incomplete guidance on how auditors should incorporate precision into their judgments and no guidance on determining an acceptable range of difference between the expectation and recorded amount that is consistent with the desired level of assurance.

Entwistle and Lindsay (1994) found that the majority of misstatements identified by the use of APs in audit engagements (78.9 percent) were signalled during the fieldwork stage. Given a level of noise, Law and Willett (2004) showed that accounting error characteristics – such as size, dispersion patterns and the ratio of error size to materiality level – have a systematic effect on the overall error signalling ability of APs. Most APs perform poorly when the material errors are widely dispersed. When there are few material errors to detect, APs frequently signal false alarms.

During the final review stage, auditors used APs to assess the conclusions reached in an audit and in evaluating the overall financial statement reasonableness (Mancuso, 1992; Mahathevan, 1997; ISA 520; Cho and Lew, 2000). A number of research studies have reported that APs are most effective when used in the planning and final review stages of an audit to identify areas of risk where additional testing may be necessary (Biggs *et al.*, 1988; Knechel, 1988; Mahathevan, 1997; Cho and Lew, 2000).

The performance of the various audit tests has been modeled as a function of the auditor's ability, knowledge, and experience (Libby, 1995). When audit tasks are performed by groups of auditors in sequential stages, it is very probable that diversity exists in auditors' reliance on APs at each stage as a result of differences in experience. In this context, Cho and Lew (2000, p. 432) argued that:

> In the absence of an acceptable benchmark for materiality, it is likely that the extent of AR application at each stage should vary partly because of the auditors' degree of involvement in that stage and partly because of differences in audit experience. Empirical evidence on such diversity has, therefore, important implications, especially for the allocation of resources among audits.

The above discussion leads to the following research question:

RQ1. Is there any difference in the extent of using APs during the three stages of an audit (i.e. planning, detailed testing, and final review)? Does the extent of use vary with firm type (Big 4 versus non-Big 4) and/or experience level (high versus low)?

3.2 Effectiveness of AP in achieving audit objectives

There is a belief that the reliance on APs as "directing attention", as "test-reducing" and as an overall reasonable check on fair presentation of FS will result, in an effective and efficient audits (Cho and Lew, 2000). Most of the research assessing the effectiveness of APs concentrated on its ability in signalling errors in FS (Wright and Ashton, 1989; Calderon and Green, 1994; Green and Calderon, 1994; Grice, 2005; Mahoney, 2005; Omura and Willett, 2006). Biggs and Wild (1984) and Kreutzfeldt and Wallace's (1986) studies revealed that more than or up to 40 percent of all errors encountered by auditors can be detected by APs. Biggs and Wild (1984) pointed out that judgmental procedures such as ratio analysis and scanning were preferred over regression and time series models. Hylas and Ashton (1982) have found that a large number of errors (46 percent of the total errors) were initially signalled by APs techniques in 152 different audits by an accounting firm.

In addition, research by Coglitore and Berryman (1988) supported the ability of APs to reveal unusual relationships and significant changes in financial statement items. They also observed that APs can help auditors detect intentional misstatements. The results of Law and Willett (2004) suggested that APs which relied more on annual balances showed a better error signalling abilities than other APs in the face of transaction errors. While APs play a special role in detecting errors, the effectiveness and efficiency of AP can also be assessed from the perspective of other audit objectives (Mahathevan, 1997; Cho and Lew, 2000). These objectives may include: need to gain insight about the business and industry, to identify potential financial and operational weaknesses, to identify significant fluctuations in FS, to determine the nature, extent, and timing of substantive tests, to assess the reasonableness of specific account balances, and to assess the overall fairness of FS. The above discussion leads to the following research question:

RQ2. Is there any difference in the importance placed upon APs for achieving the various audit objectives? Does the importance placed upon APs for achieving the various audit objectives vary with firm type (Big 4 versus non-Big 4)?

3.3 Types of APs used

The results of Law and Willett (2004) suggest that auditors should be selective in choosing an appropriate type of AP to achieve their required audit objective. Such objective may include the type of underlying accounting errors that they are seeking to identify. APs range from "simple" to "sophisticated" ones (Mahathevan, 1997; Cho and Lew, 2000; Lin and Fraser, 2003; ISA 520). The "simple" or "evaluative" procedures include simple comparisons, ratio analysis, common size statements and trend statements. Mahathevan (1997) argued that these AP techniques use pertinent past information to assist the auditor in understanding the client and industry, identifying

and assessing potential risk, assessing the extent of audit tests, and corroborating conclusions and ascertaining the overall reasonableness of the financial information.

The "sophisticated" or "predictive" procedures are time series analysis and modeling, regression analysis, and financial modeling. These procedures are "used to estimate the level of activity or the balance of an account based upon an identified trend or relationship" (Mahathevan, 1997). Research findings in Canada (Smith, 1983; Lin and Fraser, 2003), Australia (Booth and Simnett, 1991), the USA (Ameen and Strawser, 1994), Singapore (Mahathevan, 1997), and Hong Kong (Cho and Lew, 2000) have shown that simple procedures are more widely used than sophisticated procedures. The above discussion leads to the following research question:

RQ3. Is there any difference in the frequency and effectiveness of use between the simple and sophisticated procedures of APs? Does the frequency and effectiveness of use of the APs procedures vary with firm type (Big 4 versus non-Big 4)?

3.4 Assurance provided by AP and influence on detailed testing

Consistent results were found in the auditing literature concerning the type of assurance provided by APs as well as its effects on the detailed testing expected to be performed by auditors. Prior research (Biggs *et al.*, 1988; Mulligan and Inkster, 1999) indicated that auditors tend not to reduce the level of detailed testing, even if results from the use of APs are favorable. This is partially due to the fact that APs provide assurance of a negative-type (Blocher and Willingham, 1988; Grice, 2005). A similar conclusion revealed by Lin and Fraser (2003) who indicated that a minority (37 percent) of auditors who responded to the survey would reduce the level of detailed testing when the results of APs are favorable. Even though the above results do not allow cost savings from favorable results of APs, it seems likely that the auditors of companies with strong electronic internal control systems who achieve favorable APs results will spend less time in detailed testing of their clients' transactions and balances. The above discussion leads to the following research question:

RQ4. Is there any difference in the assurance provided by APs and its influence on detailed testing? Does the influence on detailed testing vary with firm type (Big 4 versus non-Big 4)?

3.5 Importance of factors in evaluating unexpected fluctuations and driving increased use of APs

ISA 520 indicates that when designing and intending to perform APs as substantive procedures, the auditor will need to consider a number of factors including the following:

- the reliability of the data, whether internal or external, from which the expectation of recorded amounts or ratios is developed;
- whether the expectation is sufficiently precise to identify a material misstatement at the desired level of assurance;
- the amount of any difference of recorded amounts from expected values that is acceptable;
- objectives of the APs and the extent to which their results can be relied upon;

- nature of the entity and the degree to which information can be disaggregated; and
- understanding of the effectiveness of the accounting and internal control systems and the types of problems that in prior periods have given rise to accounting adjustments.

Based on the above factors, the following research question is suggested:

RQ5. Is there any difference in the importance of factors given in the standards, in evaluating unexpected fluctuations and increasing the use of APs? Does the importance of factors given in the standards vary with firm type (Big 4 versus non-Big 4)?

3.6 Role of auditing standards in the context of APs

The findings of many research studies in the UK (Mulligan and Inkster, 1999), the USA (Ameen and Strawser, 1994; Blocher and Loebbecke, 1992), and Canada (Lin and Fraser, 2003) suggest that auditing standards on APs have had greater impact upon the practice of smaller firms than that of larger or Big CPA firms. This may be due to the limited financial resources available for small CPA firms to prepare their own audit manuals, provide CPE and training to all or some members of the audit staff. In addition, small CPAs lack the knowledge for IT application in auditing, a matter which restrict the ability of those firms members from experimenting and testing new audit techniques adopted by large CPAs. Small firms tend to delay the application of any new concept or technique of auditing until a standard is issued and guidelines are prepared by the appropriate professional body(ies) to grasp the benefits of applying such concept or technique.

On the other hand, Blocher and Loebbecke (1992) indicated that in the USA, some large firms' internal guidances provide more details for the application of APs in audit engagements that goes well beyond SAS No. 56. In this context, Lin and Fraser (2003) argued that "It is, therefore, not surprising to find that the impact of the professional standard on these firms' practice is slight". The above discussion leads to the following research question:

RQ6. Is there any difference in the role of auditing standards in the context of APs? Does the role of auditing standards in the context of APs vary with firm type (Big 4 versus non-Big 4)?

4. Research objectives and methodology

The current study examines differences in the perception of auditors about the use of APs in audit engagements with three cross-classifications. These are the type of firm, following Mahathevan (1997) and Lin and Fraser (2003) (i.e. Big 4 versus non-Big 4), the experience level in line with Mahathevan (1997), Cho and Lew (2000), Lin and Fraser (2003) (i.e. high versus low experience) and the particular techniques used and issues examined in line with Mahathevan (1997), Cho and Lew (2000) and Lin and Fraser (2003) (i.e. audit stages and APs used). In addition, the particular issues examined are expanded, following Mahathevan (1997) and Cho and Lew (2000) to include audit objectives that can be achieved in a typical audit with the use of APs. Other issues highlighted also analyzed in detail in line with Lin and Fraser (2003)

include the types of assurance provided by APs and their influence on detailed testing, the importance of factors in evaluating unexpected fluctuations and driving increased use of APs, and the role of auditing standards in the context of APs.

In light of the previous discussion, the research method is designed with the following six-fold objectives:

(1) investigate the extent of use of APs in Egypt during the three main stages of an audit (i.e. planning, detailed testing and final review) by different size of firms and different levels of audit staff;

(2) examine auditors perceptions of the effectiveness of APs in achieving a selected set of audit objectives;

(3) identify the frequency and effectiveness of different types of APs techniques (procedures) which Egyptian auditors consider useful in carrying out AP in auditing;

(4) identify the influence of the assurance provided by APs on detailed testing;

(5) identify the importance of factors in evaluating unexpected fluctuations and driving increased use of APs; and

(6) identify the role of auditing standards in the context of APs.

The responses to these questions will provide supported evidence though not necessarily conclusive as to the value of the APs in terms of supporting auditors in practical audit settings.

4.1 Sample

This research is designed to help understand the Egyptian practice in the area of APs, as well as the role of auditing standards in an APs context. We used a questionnaire survey to collect the data. The questionnaire was designed so that most questions could be answered either by indicating "yes" or "no" or by rating alternatives on a five-point Likert-type scale. The questionnaire was pilot tested and refined in accordance with the feedback received from the pilot study.

We seek to collect information on actual uses of AP from 14 audit firms in Egypt (Big 4 audit firms and ten local audit firms). Those 14 audit firms comprise those that audit the 100 actively traded companies on the EGX 100 (CASE, 2008). The annual reports of those 100 companies were obtained from the Egyptian Company for Information Dissemination, to identify the auditor name and affiliation from the auditor report section. The survey was carried out between 2008 and 2009. Professional staff levels in the Big 4 firms vary from about 400-1,000 employees. The Big 4 firms audit nearly 60 percent of the CASE 100 companies. Medium/small-sized (non-Big 4) local firms have a staff size of between 20 and 150 employees, and there are about 14 such firms involved in the audit of the EGX 100 companies list.

A total of 400 questionnaires were distributed. To establish initial contact, a letter stating the purpose of the study was mailed to every firm surveyed. Questionnaires were then subsequently hand-delivered to both types of firms through a partner. For each of the Big 4 firm, 50 questionnaires were sent to three levels of practicing auditors: partners, managers, and seniors. For each local firm, 20 questionnaires were sent to three levels of practicing auditors: partners, managers, and seniors. Completed responses were collected from the firms' offices during a period of six to eight weeks.

The review of the literature showed that many researchers categorize their findings according to whether they relate to "Big 4" or "non-Big 4" firms (Ameen and Strawser, 1994; Mahathevan, 1997). There is no published information in Egypt according to the size of audit firms as measured by the number of partners, and the responses, following the literature just cited (Table I) are classified into two subgroups: large category (if they were from the Big 4), medium/small category (for all non-Big 4 local firms).

As can be seen from Table I, 42 percent of the Big 4 auditors responded as opposed to 56.5 percent of the non-Big 4 auditors. This contrasts with the study by Mahathevan (1997) in Singapore who indicated that 32.2 percent of the Big 6 auditors responded as opposed to 43 percent of the non-Big 6 auditors. Comparisons therefore need to be interpreted in this context.

4.2 Design of the questionnaire

We designed 11 questions focusing on issues arising from our review both of the academic research on APs and recent professional developments. The questions in the survey were developed from the questionnaire surveys conducted in Singapore (Mahathevan, 1997), Hong Kong (Cho and Lew, 2000), and Canada (Lin and Fraser, 2003) to analyze and compare the role and extent of us of APs in the audit process. The questionnaire (the Appendix) covered six distinct sub-areas – the extent and frequency of APs use, effectiveness of AP in achieving a selected set of audit objectives, APs used, influence on detailed testing, reasons for changes in use, and the role of auditing standards in the context of APs. Participants were asked to base their answers on their general audit experience. They were assured of the confidentiality of individual responses.

To achieve *RQ1* on the extent of use of APs, Questions 1 and 2 sought to determine the percentage(s) of audits on which APs were used and their use at each audit stage (planning, fieldwork and final review) by different types of firms (Big 4 versus non-Big 4), and by different level of auditors (Partners, managers, and seniors). Auditors in the position of audit seniors are considered as having "low" experience while auditors in the position of managers and partners are considered as having "high" experience.

To achieve *RQ2* on the effectiveness of AP in achieving audit objectives, the third question required respondents to rate, on a five-point Likert-type scale (where 1 – extremely effective and 5 – not at all effective), their perception of the effectiveness of the use of APs in achieving seven audit objectives during the three stages of the audit (planning, fieldwork, and final review). These objectives are broadly grouped by their major functions in line with Cho and Lew (2000) as follows: attention directing (to gain insight on the business and industry, to identify potential financial and operational weaknesses, and to identify significant fluctuations in FS), test reducing (to determine

	Sample		Responses				
Firm type	No. of questionnaires distributed	No. of firms	No. of respondents	%	Partners	Managers	Seniors
Big 4	200	4	84	42	17	28	39
Non-Big 4	200	10	113	56.5	19	32	62
Total	400	14	197	49.25	36	60	101

Table I.
Survey distribution and response

the nature, extent, and timing of substantive tests, and to detect errors and misstatements in FS), assessing fairness (to assess the reasonableness of specific account balances and to assess fairness of FS as a whole).

Questions 4 and 5 listed five common APs used by auditors showing their frequency of use, as well as their effectiveness in detecting material errors (*RQ3*). This is based on the types of APs identified in the study by Lin and Fraser (2003). These APs range from simple to sophisticated APs. Participants were asked to circle the frequency of use for each procedure on a five-point Likert-type scale. Question 6 seeks to determine the influence of the assurance provided by APs on detailed testing (*RQ4*).

Regarding *RQ5* on the importance of factors in evaluating unexpected fluctuations and driving increased use of APs, Question 7 determines the importance of a set of factors in evaluating unexpected fluctuations between the client's un-audited data and the auditor's expectations according to ISA 520 (inherent risk level, internal control strength, accounts predictability, data reliability, and APs chosen). Participants are asked to circle the importance of factors on a five-point Likert-type scale (1 – very important and 5 – least important). Question 8 requires the respondents to indicate whether their firm's use of APs has increased, decreased or remained unchanged over the last decade. In order to find out the importance of factors driving increased use of APs, question 9 listed six factors based on those used by Lin and Fraser (2003) to facilitate the comparison with previous research.

In order to find out the role of auditing standards in the context of APs (*RQ6*), question 10 asked the participants to indicate whether the current ISA provides Sufficient guidance for effective performance of APs. In addition, question 11 listed four factors on how effective the auditing standard had been in various areas of practice. These factors are based on those used by Lin and Fraser (2003) to facilitate the comparison with previous research. Participants were asked to circle the effectiveness of factors on a five-point Likert-type scale (where 1 – very effective and 5 – least effective).

5. Findings, analysis, and discussion

In the analysis of the data, the results of the survey are examined in the light of prior research findings.

*5.1 Extent of use of APs (*RQ1*)*

5.1.1 Overall, extent of use. Table II provides the proportion of audits on which APs were used, and provides a direct contrast between use of APs in Egypt and in Canada. Table II indicates wide variation in the overall use of APs, ranging from less than 20 percent to more than 90 percent. Overall, 22 percent of respondents indicated that they used APs on between 81 and 100 percent of audits and a further 58 percent reported use of APs on between 61 and 80 percent. The mean extent of use was 54 percent compared to 79 percent in Canada. The relatively low use of APs by Egyptian auditors might be attributable to the lack of knowledge and experience about the application of APs especially the use of statistics and professional judgment in interpreting the results of APs. Many practitioners mainly in non-Big 4 firms do not possess such knowledge due to acquiring their licenses without any professional examinations, as discussed in Section 2. Also, the notion of the risk of legal liabilities forces Egyptian auditors especially in non-Big 4 audit firms to rely on documentation, re-performance, and inquiry compared to APs.

Percentage of audits on which APs used	Egypt (current study) Number and percent of auditors Big 4 Number	%	Non-Big 4 Number	%	Overall Number	%	Canada (Lin and Fraser, 2003) Overall Number	%
0-20	0	0	11	10	11	6	1	0
21-40	14	17	31	27	45	23	11	7
41-60	27	32	34	30	61	31	16	9
61-80	33	39	25	22	58	29	31	17
81-100	10	12	12	11	22	11	123	67
	84	100	113	100	197	100	182	100
Mean extent of use (%)	59		49		54		79	
Pearson χ^2-test 15.579 ($p = 0.004$)*								

Notes: *$p < 0.01$; a comparison with Canada

Table II.
Percentage of audits on which APs used

The results of the study also show that APs were used on 59 percent of audits carried out by Big 4 firms as compared to 49 percent of audits conducted by non-Big 4 audit firms. This is inconsistent with the results reported in Canada which indicate that APs were utilized on 86 percent of audits carried out by Big 4 firms as compared to 71 percent of audits conducted by non-Big firms. This confirms our findings that Egyptian auditors are not yet motivated mentally and ready "technically" to comply with ISA requirements. Using the χ^2-test for all five levels of the frequency tested, our results indicate statistically significant differences at the 1 percent level, indicating that the two groups of users are significantly different in their usage of APs in the audit process.

5.1.2 Extent of use by different types of auditors. Table III reports the proportion of audits on which APs were used at each audit stage by different types of auditors (Big 4 versus non-Big 4) and provides a selected direct comparison between the use of APs in Egypt and Canada. Table III provides evidence that auditors in Egypt rely on APs at all stages of audit engagements (mean percentage of usage: planning: 60; fieldwork: 56; final review: 62). This is consistent with findings in the UK, Singapore, Hong Kong and Canada (Fraser *et al.*, 1997; Mahathevan, 1997; Cho and Lew, 2000; Lin and Fraser, 2003). It is also apparent that APs are more extensive in use during the final review stage (mean percent = 62) in contrast to the other two stages of the audit. This confirms results from an earlier Canada, the UK and Hong Kong surveys (Fraser *et al.*, 1997; Cho and Lew, 2000). This is due to auditors needs for extra assurance after assessing the results of fieldwork tests.

Percentage of audits on which APs used at each audit stage	Egypt (current study) Big 4 (%)	Non-Big 4 (%)	Mean (%)	Canada (Lin and Fraser, 2003) Big 4 (%)	Non-Big 4 (%)	Mean (%)
Planning	72	51	60	80	50	57
Fieldwork	62	51	56	76	52	63
Final review	69	58	62	86	85	80

Table III.
Percentages of audits on which APs are used at each audit stage by Big 4 versus non-Big 4 firms

Similar to the findings of previous studies (Ameen and Strawser, 1994; Mahathevan, 1997; Lin and Fraser, 2003), auditors from Big 4 firms are found to use APs to a greater extent (planning 72 percent, fieldwork 62 percent, final review 69 percent) than auditors from non-Big 4 firms (planning 51 percent, fieldwork 51 percent, final review 58 percent). This difference could be related to differences in the client size as argued by Mahathevan (1997) and Lin and Fraser (2003). The Big 4 firms audit most of the large and multinational companies with more structured and well defined controls as opposed to smaller audit clients. Both auditing pronouncements and research studies have shown that the greater the quality of internal controls system within the audit clients, the more auditors use APs in audit as the data produced by the system would be more reliable (Kinney, 1979; Tandy, 1992; Hirst and Koonce, 1996; Mahathevan, 1997; Hirst and Koonce, 1996; Mulligan and Inkster, 1999).

Generally, Table III also shows that both types of auditors in Egypt use APs far less extensively in all stages of the audit than did auditors in Canada. As Big 4 firms adopt a universal audit approach strategy, this finding is surprising. Mahathevan (1997) also reports that auditors in Singapore spent less time on APs in all stages of the audit than did auditors in the USA. This gap may result from the lack of effective control mechanisms for imposing sanctions on public accountants and auditors who fail to comply with accounting and auditing standards (Samaha and Stapleton, 2008, Samaha, 2005).

World Bank (2002) report indicates that knowledge deficiencies of most Egyptian practitioners of ISA especially in non-Big 4s restrict the implementation of sound auditing practice. Although Big 4 auditing firms have greater competence to provide high auditing quality, compliance with the applicable auditing standards is not always ensured. According to a survey finding by Wahdan *et al.* (2005) in Egypt, a gap exists between auditing standards and actual auditing practice, and that a lack of understanding of auditing standards results in non-compliance or partial compliance with such standards. This is a problem faced by many auditors who are not part of international accounting firm networks.

5.1.3 Extent of use by different levels of auditors. Tables IV and V present the individual and combined percentages of the use of APs by different levels of auditors

Auditors by ranks	1	2	3	4	5
During planning stage					
Partners	44.4	47.2	8.3	–	–
Managers	41.7	40	10	5	3.3
Seniors	36.6	29.7	12.9	18.8	2
During fieldwork stage					
Partners	13.9	72.2	5.6	8.3	–
Managers	18.3	51.7	23.3	6.7	–
Seniors	19.8	51.5	16.8	5	6.9
During final review stage					
Partners	63.9	25	11.1	–	–
Managers	35	51.7	6.7	6.7	–
Seniors	40.6	34.7	12.9	4	7.9

Table IV.
Extent of use of AP by different levels of auditors

Notes: In percentage of responses by rank; mode of response: 1 – to a very large extent; 2 – to a large extent; 3 – to some extent; 4 – to a lesser extent; 5 – none at all

(partners, managers, and seniors) in the planning, fieldwork, and review stages of the audit. The results indicate that reliance on APs tends to differ by rank or position. Auditors at higher ranks tend to use more APs than senior auditors. This result is applicable for both the planning and review stages with a minor exception found at the fieldwork in which seniors record slightly greater use of APs (71.3 percent) than managers (70 percent).

The greatest extent of APs use by partners and managers occurs at the planning and review stages. This is expected as most of the planning and the overall review are usually under-taken by more experienced auditors while less experienced auditors are generally concerned with the detailed testing phase (Sandlin, 1987; Booth and Simnett, 1991; Mahathevan, 1997). The result of extensive use of APs at the final review stage by more experienced auditors (i.e. partners and managers) is also consistent with Cho and Lew (2000). Partners and managers are more involved in the final review of an audit before issuing an audit opinion.

*5.2 Effectiveness of AP in achieving audit objectives (*RQ2*)*

Table VI shows that APs are perceived by 71.1 percent of all auditors as being extremely effective in identifying significant fluctuations in FS; 46.2 and 37.6 percent of auditors consider APs to be extremely effective in identifying potential financial and operational weaknesses, and in obtaining knowledge of the business and industry, respectively. For test reduction purpose, 36 percent of auditors consider APs extremely effective in determining the nature, extent and timing of substantive tests, while only 33 percent is said to accept AP as being highly effective in detecting errors, respectively. At the final review stage, APs are seen as being extremely effective by 50.8 and 36 percent of auditors in assessing reasonableness of specific account balances and transactions, and in assessing overall fairness of FS. For all practical purposes, the majority of auditors consider AP useful.

Stages	Partners	Managers	Seniors
Planning	91.7	81.7	66.3
Fieldwork	86.1	70	71.3
Final review	88.9	86.7	75.2

Note: In percentages

Table V.
Comparative analysis of the extent of use of AP among different level of auditors at all stages of audits

Audit objectives	Effectiveness of AP 1	2	3	4	5
1-1. Obtain knowledge of the business and industry	37.6	31.5	14.7	16.2	–
1-2. Identify potential financial and operational weaknesses	46.2	44.7	9.1	–	–
1-3. Identify significant fluctuations in the FS	71.1	26.4	1.5	1	–
2-1. Determine the nature, extent and timing of substantive testing	36	46.7	9.6	7.6	–
2-2. Determine errors and misstatements in FS	33	37.1	27.4	2.5	–
3-1. Assess reasonableness of specific account balances	50.8	43.1	5.1	–	1
3-2. Assess overall fairness of presentation	36	35	22.3	5.1	1.5

Notes: In percentages of total responses; scale of response: 1 – extremely effective; 5 – not at all

Table VI.
Effectiveness of AP in achieving audit objectives

Table VII presents the mean values of all auditors' responses, as well as mean values of Big 4 versus non-Big 4 responses ranked by the degree of effectiveness, for the seven audit objectives. Similar to the findings of Cho and Lew (2000), APs are most effective in identifying significant fluctuations in FS. APs are second most effective in assessing reasonableness of specific account balances. On the other hand, APs were perceived to be least important for understanding client's business, for assessing overall fairness, and for detecting errors, respectively (in increasing order of importance). Although a number of studies (Hylas and Ashton, 1982; Biggs and Wild, 1984; Tabor and Willis, 1985; Kreutzfeldt and Wallace, 1986; Coglitore and Berryman, 1988; Fraser *et al.*, 1997; Chen and Leitch, 1998; Law and Willett, 2004) have shown APs to be useful in detecting fraud or error, they are perceived in Cho and Lew study to be less helpful in detecting these misstatements as compared to the other audit objectives (mean = 1.9949). Mahathevan (1997) reported similar results in Singapore as APs were perceived to be the least helpful in detecting fraud or error. Cho and Lew (2000, p. 435) argued that:

> One should not, however, consider the mean value associated with the detection of errors in financial statements as an indication that AP is completely useless in signalling errors. After all, there has been substantial empirical evidence in the literature attesting to the fact that on average over 40% of errors in financial statements can be signalled through AP.

From all the above analysis, it is important to note that the ranks are rather informative as audit objectives with higher ranking relate entirely to the planning and final review stages.

Table VII also summarizes the perceived importance of APs in achieving audit objectives by both types of firm. Auditors from both firms attach greater importance to the usefulness of APs for identifying significant fluctuations in FS. The use of APs for identifying potential financial and operational weaknesses and assessing reasonableness of specific account balances are perceived to be of almost equal importance among both types of firms. Furthermore, consistent with Mahathevan (1997) in Singapore, Table VII shows that APs are perceived to be of least importance for the detection of fraud or error by auditors from both firms (ranked fifth by non-Big 4 auditors and last by Big 4 auditors). Thus, this observation may imply that in Egypt,

	Effectiveness of AP			
Audit objectives	Big 4	Non-Big 4	*t*-test sig.	Mean value
1-1. Obtain knowledge of the business and industry	1.8319 (5)	2.4524 (7)	Sig.*	2.0964 (7)
1-2. Identify potential financial and operational weaknesses	1.6786 (3)	1.5929 (2)	n/s	1.6294 (3)
1-3. Identify significant fluctuations in the FS	1.3810 (1)	1.2832 (1)	n/s	1.3249 (1)
2-1. Determine the nature, extent and timing of substantive testing	1.8452 (6)	1.9204 (4)	n/s	1.8883 (4)
2-2. Determine errors and misstatements in FS	2.0119 (7)	1.9823 (5)	n/s	1.9949 (5)
3-1. Assess reasonableness of specific account balances	1.5000 (2)	1.6283 (3)	n/s	1.5736 (2)
3-2. Assess overall fairness of presentation	1.7876 (4)	2.3095 (6)	Sig.*	2.0102 (6)

Notes: In order of mean value of responses; significant at the *1 percent level; scale of response: 1 – extremely effective; 5 – least effective; ranks are given in parentheses

Table VII.
Big 4 versus non-Big 4 firms ranking of AP in achieving audit objectives

auditors may not be aware of the potential of APs in detecting fraud or error due to their lack of understanding of ISA 520.

As can be seen from the *t*-test significance in Table VII, there is a significant difference between both firms on the perceived importance of the use of APs for only two audit objectives, i.e. Obtain knowledge of the client's business and industry, and assessing the overall fairness of presentation. Auditors from Big 4 firms attach greater importance to the usefulness of APs for obtaining knowledge of the client's business and industry (mean = 1.8319) as opposed to auditors from non-Big 4 firms (mean = 2.4524). Also, auditors from Big 4 firms attach greater importance to the usefulness of APs for assessing the overall fairness of presentation (mean = 1.7876) as opposed to auditors from non-Big 4 firms (mean = 2.3095).

This is due to differences in the extent of use of APs by auditors during the three phases in Big 4 firms to acquire information about industry, competitors, and previous year results which are used to assess fairness of accounts balances. Moreover, the comparison technique needed to assess fairness of balances can be applied more easily by qualified and well experienced auditors in such big firms.

*5.3 Types of APs used (*RQ3*)*

Table VIII presents the mean values of responses on APs used. The first three are considered relatively simple techniques that are easy to apply but call for more subjective judgment while the last two are quantitatively based methods which are more objective and give better precision and control but are more costly to apply. Table VIII shows that audit firms of all size continue to use subjective procedures as compared with those that are quantitatively based. The results of the study show that a great proportion of auditors rely extensively on ratio analysis; scanning analysis and simple reasonableness tests. This finding is consistent with prior research (Ameen and Strawser, 1994; Turley and Cooper, 1991; Fraser *et al.*, 1997; Cho and Lew, 2000; and Lin and Fraser, 2003) where simple APs were reported to dominate the AP process. Only trend analysis is used in Egypt with moderate frequency from among the four APs that have been cited in the literature as being more objective. In Egypt, auditors who use regression analysis in AP are clearly trivial.

Two important observations are evident from the above study results. First, the results are surprising given the higher investment by Big 4 firms in audit automation. Second, the trend may be of concern as research has shown that judgmental AP techniques are inefficient and ineffective because they constitute subjective evaluation based on auditors' personal experience and knowledge of the clients (Fraser *et al.*, 1997). At the same time, sophisticated procedures provide significantly better and more accurate expected or predicted amounts (Calderon and Green, 1994), reflecting a gap between academics and auditing practitioners on the potentials of APs.

Table VIII also indicates significant differences as indicated by the *t*-test between Big 4 and non-Big 4 firms in the use of all five APs. Auditors from Big 4 firms tend to use APs to a greater extent than those from non-Big 4 firms. One of the factors affecting the use of APs is the auditor's knowledge of its objectives and identified limitations as well as the auditor's perception of the effectiveness of such procedures (Mahathevan, 1997). APs were found to signal a larger proportion of misstatements as the size of the client increased (Entwistle and Lindsay, 1994). As such, it is possible that the Big 4 auditors' use of APs is higher because of the size of the client audited

Table VIII.
APs used: frequency and effectiveness in detecting material errors

Procedures used	Frequency of use				Effectiveness of use			
	Egypt (current study)			Canada (Lin and Fraser, 2003)	Egypt (current study)			Canada (Lin and Fraser, 2003)
	Big 4	Non-Big 4	Mean	Mean	Big 4	Non-Big 4	Mean	Mean
Scanning analysis	1.69*	1.90*	1.81	1.25	1.92**	2.21**	2.09	2.68
Trend analysis	1.65***	2.61***	2.20	1.28	1.77***	2.87***	2.40	2.53
Ratio analysis	1.31**	1.51**	1.43	2.05	1.60**	1.89**	1.77	2.96
Simple reasonableness test	1.58***	2.45***	2.08	1.73	1.80***	2.89***	2.43	2.04
Regression models	2.55*	2.84*	2.72	3.90	2.94*	3.23*	3.11	4.48

Notes: Significance at: *10, **5, and ***1 percent levels; scale of response: 1 – very often (extremely effective); 5 – never (least effective)

(larger clients) and the perceived effectiveness of those clients' internal control procedures. As to the reasons behind some non-Big 4 firms use of regression models, it seems auditors in those firms did not understand the exact meaning of such technique as well as their desire to show that they are capable of applying techniques used by Big 4. This improper attitude by non-Big 4 auditors is a characteristic of people behavior in less developed countries when they are faced with situations where their knowledge of the subject under study is weak.

Moreover, Big 4 firms tend to use regression analysis to a greater extent than non-Big 4 firms given strong control systems existing at large clients. This is due to those large clients generation of more reliable and consistent data for the performance of statistically based APs. It is likely that the clients serviced by non-Big 4 firms are too small for the use of such procedures and auditors face difficulty in ascertaining the reliability of the data provided by the client's accounting system (Schmutte, 1990). However, the costs arising from the use of sophisticated procedures may exceed the benefits to be derived. This is perhaps the main reason why such procedures are hardly used by non-Big 4 firms (Ameen and Strawser, 1994).

Finally, Table VIII provides that respondents ranked APs from high to low in terms of their relative effectiveness in detecting material error as follows: ratio analysis, scanning analysis, trend analysis, reasonableness tests, and regression analysis. The results slightly compare to the earlier Canadian survey (Lin and Fraser, 2003). Previous studies (Biggs *et al.*, 1988; Lin *et al.*, 2000; Mulligan and Inkster, 1999) have identified a tendency towards conservatism in the way in which auditors approach APs and a possible lack of confidence in the use of APs as substantive tests. It is argued by Lin and Fraser (2003, p. 160) that:

> It seems likely that the judgment grounded nature of auditing practice leads to auditors being unconvinced by the certainty implied by statistically based techniques. This scenario may be viewed in a wider context as part of a continuing desire on the part of the auditing profession to avoid codifying audit practice in other than in general and non-specific terms [. . .] This is pointed out frequently as one of the critical factors underlying the power base of a profession. While it may be fanciful to seriously assess the views of auditors on "judgment" versus "certainty" as a direct product of such a scenario, the preference for "judgment" over "quantification" may reflect traditional, and defensive, attitudes regarding the judgment-based aspects of auditing.

*5.4 Influence on detail testing (*RQ4*)*

In order to investigate the role of APs in the audit evidence collection process, we asked auditors to indicate how the assurance provided by APs influences the level of substantive testing. The results are shown in Table IX.

Table IX demonstrates that a minority of auditors (33 percent) would reduce the level of detailed testing when the results of APs are favorable. Although ISA 520 implies that the use of APs may be used to reduce levels of substantive testing, there are clearly limits in the extent to which auditors believe that this is possible as argued by Lin and Fraser (2003). About 46 percent indicated that they would obtain corroborating evidence from other sources before changing the level of detailed testing. A further 21 percent of respondents stated that they would maintain the same level of detailed testing even if the results of APs indicate nothing unusual. Taken together, these results indicate a lack

of confidence in the use of APs as substantive procedures as indicated by prior research (Lin and Fraser, 2003).

*5.5 Importance of factors in evaluating unexpected fluctuations and increasing the use of APs (*RQ5*)*

Table X shows that no significant variance was found between different sizes of firms with regard to the importance of three factors in evaluating significant unexpected fluctuations. Internal control strength and data reliability were rated as significantly more important than the other factors. Although the choice between different APs was less important than those three factors, there is a significant difference between both types of firms regarding the AP chosen. This evidence lends further support to our findings under *RQ3*. The APs chosen were ranked as the least important factor by non-Big 4 firms and this may indicate that auditors of those firms are unaware of the relative strengths and weaknesses of specific APs, as opposed to Big 4 firms who ranked it in the third position.

Results in Table X also show that the majority of auditors in Big 4 firms (61 percent) indicated that their firm's use of APs has increased over the last decade. However, only 34 percent of the non-Big 4 firms indicated increase in their use of APs over the same period. This observation lends further support to our findings under *RQ1*.

Table XI shows that more availability of computers with auditors at fieldwork, increased reliance as a direct source of evidence, and overall change in audit approach are considered to be the most important factors contributing to the increased use

	Egypt (current study)			Canada (Lin and Fraser, 2003)
Influence on detail testing	Big 4	Non-Big 4	Mean	Mean
Reduce the level of detailed testing accordingly	53.6	17.7	32.99	37.4
Corroborate evidence from other sources before reducing level of detailed testing	41.7	48.7	45.70	50.5
Maintain same level of detailed testing anyway	4.8	33.6	21.31	12.1

Note: In percentage of total responses

Table IX.
Influence on detailed testing

	Egypt (current study)				Canada (Lin and Fraser, 2003)
	Big 4	Non-Big 4	Mean	*t*-test	Mean
Importance of factors in evaluating unexpected fluctuations					
Inherent risk level	1.97	1.76	1.85	n/s	2.17
Internal control strength	1.64	1.47	1.54	n/s	2.08
Accounts predictability	2.46	2.00	2.20	Sig.	1.65
Data reliability	1.71	1.55	1.62	n/s	1.66
Analytical procedures chosen	1.75	2.19	2.00	Sig.	2.44
Use of APs					
Increased	60.7	33.6	45.2		
Decreased	8.3	23.0	16.8		
Remain unchanged	31.0	43.4	38.1		

Notes: Scale of response: 1 – very important; 5 – least important

Table X.
Importance of factors in evaluating unexpected fluctuations and use of APs

Importance of factors driving increased use of APs	Egypt (current study) Big 4	Non-Big 4	Mean	*t*-test	Canada (Lin and Fraser, 2003) Mean
Increased fee pressures	2.97	2.15	2.50	Sig.	2.26
Increased professional guidance	3.37	3.25	3.30	n/s	2.94
Increased reliance as a direct source of evidence	2.07	1.76	1.89	n/s	2.36
Overall change in audit approach	1.75	2.19	1.96	Sig.	2.07
Increased availability of computers	1.83	1.37	1.57	Sig.	2.33
Influence of auditing standards	3.45	3.40	3.42	n/s	2.96

Notes: Scale of response: 1 – very important; 5 – least important

Table XI. Importance of factors driving increased use of APs

of APs. This is partially inconsistent with Lin and Fraser (2003), who found that the overall change in audit approach and increased fee pressures to be the most important factors contributing to the increased use of APs in Canada. This may be due to major differences between audit environment in developed and less developed countries. Mulligan and Inkster (1999) identify the switch from traditional systems to risk-based audit approaches to be significantly more influential on the increased use of APs than other factors.

The increasingly competitive audit environment has been identified as a factor in the increased use of APs in the UK and the USA by earlier research (Ameen and Strawser, 1994; Mulligan and Inkster, 1999). Auditors at those countries aim to achieve high quality of audit using the least costly audit evidence. This is achieved through the use of advanced quantitative APs, thus helping audit firms to compete in the market with less offered audit fees without affecting the quality of the audit. On the other hand, respondents rated "the influence of the auditing standard" as the least important driver of change. This may be related to the auditors concentration on standards issued under the ESA mainly the reporting areas without any efforts to study the other areas of ISA (Navady, 2001). This is true even though ISAs are applicable in audit situations where no ESA is available for application.

*5.6 Role of the auditing standard in practice (*RQ6*)*

From the 197 questionnaires returned, we received answers from only 20 respondents on whether the current ISA 520 provides sufficient guidance for effective performance of APs in Egypt, and all are partners (17 from Big 4 and three from non-Big 4 firms). The reason for such low response is that most respondents are not aware of ISA 520. Many auditors in non-Big 4 and some in Big 4 firms are not knowledgeable in English language; therefore, they are not capable of reading and interpreting ISAs that are not included in the Egyptian Arabic version. In total, 13 respondents indicated that the current standard on APs contains adequate guidance. Seven respondents suggested the need to revise the existing standard without providing suggestions for such revisions.

Table XII shows auditors' perceptions of the effectiveness of ISA 520 in four areas, namely: regulating practice in order to enhance the credibility of the profession, codifying existing approaches of larger firms, disseminating knowledge of leading edge techniques to smaller firms, and stimulating changes in the practice of APs.

Table XII.
Role of the ISA 520 "analytical procedures" in practice

Role of the auditing standard in practice	Egypt (current study) Big 4	Non-Big 4	Mean	*t*-test	Canada (Lin and Fraser, 2003) Mean
1. Regulating practice in order to enhance the credibility of the profession	2.81	1.61	2.12	Sig.	3.26
2. Codifying existing approaches of large firms	2.01	2.05	2.04	n/s	2.62
3. Disseminating knowledge of leading edge techniques to smaller firms	2.19	2.46	2.35	n/s	3.13
4. Stimulating changes in the practice of APs	3.34	3.38	3.37	n/s	2.96

Notes: Scale of response: 1 – very effective; 5 – least effective

The results are consistent with prior research (Lin and Fraser, 2003). ISA 520 was regarded as most effective in codifying existing large firms practice. Auditing standards are seen as generally concerned with procedures that are often considered as accepted practice for larger firms (Pong and Whittington, 1994; Power, 1992). There were no significant differences in perception between Big 4 and non-Big 4 auditors in relation to the role of the auditing standards, except in respect to the role of the standard in regulating practice in order to enhance the credibility of the profession.

All respondents believed that the standard has been least effective in stimulating change in audit practice which is consistent with the finding (Table XII) that the standard has been the least important influence on the increased use of APs by non-Big 4 firms. This is not in line with the Canadian survey results (Lin and Fraser, 2003) which indicated that respondents from small firms believed that the standard has been most effective in stimulating change in audit practice and that the standard has been the most important influence on the increased use of APs by small firms. Overall, this result does not support the view that smaller or non-Big 4 audit firms, which lack sufficient resources to develop their own audit methodologies, are expected to rely to a greater extent on auditing standards for guidance (Blocher and Loebbecke, 1992; Turley and Cooper, 1991; Lin and Fraser, 2003).

6. Conclusion

This study analyzes the extent of use of APs in Egypt during different stages of the audit process. The analysis made use of different sizes of CPA firms and different levels of staff. The results indicate a low use of APs by Egyptian auditors with major differences between their use by Big 4 and other auditing firms. This is attributed to lack of knowledge and experience of Egyptian auditors in the application of AP techniques as well as a lack of understanding of ISA 520. The findings support previous results about the importance of using APs at all stages of audit engagements; planning, fieldwork, and final review. Also, the reliance on APs tends to differ by type of firm and auditors rank and position. Auditors from Big 4 firms are found to use APs to a greater extent than auditors from non-Big 4 firms. Knowledge deficiencies of most Egyptian practitioners of ISA in practice restrict ensuring sound audit practice and quality.

Auditors at higher ranks within CPA firms tend to use more APs in planning and review stages than senior auditors who use APs in detailed testing phase. The study also confirmed the believe that the majority of auditors consider APs useful in achieving

audit objectives such as attention directing, test reducing, and assessing fairness of overall presentations. APs are perceived by the majority of Egyptian auditors as effective in identifying significant fluctuations in FS, identifying potential financial and operational weaknesses and obtaining knowledge of the business and industry. Audit firms of all size continue to emphasize judgment based compared to quantitatively based procedures. Finally, the study found that ISA 520 was not that effective in stimulating significant change for the use of APs in Egypt audit engagements. This is due to lack of adequate training and awareness of auditing standards, less qualified auditors and more reliance on experienced ones, insufficient materials about auditing standards taught at various universities and finally inability of some auditors to read and interpret ISA on its original English language.

Based upon all the above findings, the researchers call for more simplification and additional guidelines to accompany the existing ISA 520 to help less qualified auditors understand and apply all, not some, of the types of APs especially those associated with quantitative methods. Moreover, more research is needed to study and analyze the relationship between the risk-based audit approach and possible application of many of APs. This research could be directed to designing substantive APs for different types of accounts and different types of industries showing the benefits from the use of APs. Research is also needed to study in details the implications of using the various types of APs on the legal liability of the auditors. These suggestions support the Public Oversight Board Panel (2000) recommendations concerning the enhancement of audit effectiveness.

This study has a number of limitations. Its scope is limited to only 14 of the audit firms in Egypt. Only 197 auditors out of a total of 400 who were approached responded, with the majority of respondents being non-Big 4 firms. The results of the study may therefore be biased towards non-Big 4 auditors.

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Appendix. Questionnaire survey

General information:
Name
Audit firm:
Position (Partner/Manager/Senior):
Years of experience:

Please put a (√) mark inside the appropriate column according to your point of view:

Part one: Extent and frequency of use of analytical procedures:

A- Percentage of Audits on which APs used

0-20%	
21-40%	
41-60%	
61-80%	
80-100%	

B- Percentages of audits on which APs are used at each audit stage

Audit stage	Extent of use				
	Extensively used	Used	Not sure	Rarely used	Not used
During planning stage					
During fieldwork stage					
During final review stage					

Part two: Effectiveness of AP in achieving audit objectives:

Audit objectives	Effectiveness of AP				
	Extremely effective →				Not at all
Attention directing:					
1- Obtain knowledge of the business & industry					
2- Identify potential financial & operational weaknesses					
3- Identify significant fluctuations in the FS					
Test reducing:					
1- Determine the nature, extent & timing of substantive testing					
2- Determine errors & misstatements in FS					
Assessing fairness:					
1- Assess reasonableness of specific account balances					
2- Assess overall fairness of presentation					

(*continued*)

Part three: Procedures used: Frequency and effectiveness of use:

A- Procedures used: Frequency

Procedure	Frequency of use				
	Extensively used	Used	Not sure	Rarely used	Not used
1) Scanning analysis					
2) Trend analysis					
3) Ratio analysis					
4) Simple reasonableness test					
5) Regression models					

B- Procedures used: effectiveness in detecting material errors

Procedure	Effectiveness in detecting material errors				
	High →				Low
1) Scanning analysis					
2) Trend analysis					
3) Ratio analysis					
4) Simple reasonableness test					
5) Regression models					

Part four: Types of assurance provided and influence on detail testing:

Influence on detail testing if APs results as favorable (Please tick one box ONLY)

Reduce the level of detail testing accordingly	
Corroborate evidence from other sources before reducing level of detail testing	
Maintain the same level of detail testing anyway	

Part five: Importance of factors in evaluating unexpected fluctuations and driving increased use of APs :

A- Importance of factors in evaluating unexpected fluctuations between the client's unaudited data and the auditor's expectations

Factor	Very important →				Least important
Inherent risk level					
Internal control strength					
Accounts predictability					
Data reliability					
Analytical procedures chosen					

(*continued*)

B- Is your firm's use of APs has increased, decreased or remained unchanged over the last decade

Increased	
Decreased	
Remain unchanged	

C- Importance of factors driving increased use of APs

Factor	Very important → Least important				
Increased fee pressures					
Increased professional guidance					
Increased reliance as a direct source of evidence					
Overall change in audit approach					
Increased use of microcomputers					
Influence of auditing standards					

Part Six: Role of the auditing standard in practice:

A- Indicate whether the current egyptian auditing standard or International standard on auditing provides sufficient guidance for effective performance of APs. PLEASE Explain.

B- How effective the auditing standard had been in various areas of practice.

	Very effective → Least effective				
1- Regulating practice in order to enhance the credibility of the profession					
2- Codifying existing approaches of large firms					
3-Disseminating knowledge of leading edge techniques to smaller firms					
4- Stimulating changes in the practice of APs					
If you choose 4, please specify how this has occurred?					

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