

EXPLORING THE APPLICATION OF ANALYTICAL PROCEDURES BY JORDANIAN EXTERNAL AUDITORS

Modar Abdullatif^{*}, Aya Banna^{**}, Duha El-Sahsah^{**}, Taher Wafa^{**}

^{*} Corresponding author, Department of Accounting, King Talal School of Business Technology, Princess Sumaya University for Technology, Amman, Jordan

Contact details: Department of Accounting, King Talal School of Business Technology, Princess Sumaya University for Technology, P.O. Box 1438 Al-Jubaiha, Amman 11941, Jordan

^{**} Princess Sumaya University for Technology, Amman, Jordan



Abstract

How to cite this paper: Abdullatif, M., Banna, A., El-Sahsah, D., & Wafa, T. (2021). Exploring the application of analytical procedures by Jordanian external auditors. *Journal of Governance & Regulation*, 10(3), 44–53.

<https://doi.org/10.22495/jgrv10i3art4>

Copyright © 2021 The Authors

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0).
<https://creativecommons.org/licenses/by/4.0/>

ISSN Print: 2220-9352
ISSN Online: 2306-6784

Received: 16.04.2021
Accepted: 07.07.2021

JEL Classification: M40, M41, M42
DOI: 10.22495/jgrv10i3art4

This study aims to explore the application of analytical procedures (AP) as a major external auditing procedure in the developing country context of Jordan, a context characterised by the prevalence of closely held businesses, and limited demand for an external audit of high quality (Abdullatif, 2016; Almarayeh, Aibar-Guzman, & Abdullatif, 2020). To do so, the researchers conducted semi-structured interviews with twelve experienced Jordanian external auditors. The main issues covered are the detailed use of AP as an audit procedure and the most significant issues that may limit the effectiveness and reliability of this procedure in the Jordanian context. The main findings of the study include that AP are generally used and favoured by Jordanian auditors, despite their recognition of several problems facing the application of AP, and potentially limiting its reliability and effectiveness. These problems include weak internal controls of some clients, low quality of data provided by some clients, a lack of availability of specialised audit software for many auditors, and a lack of local Jordanian industry benchmarks that can be used to develop expectations necessary for the proper application of AP. The study recommends the establishment of such industry benchmarks, along with better monitoring by the regulatory authorities of the quality of company data, and increasing the efforts of these authorities on promoting the auditors' use of specialised audit software in performing AP.

Keywords: Analytical Procedures, Auditors, Substantive Tests, Financial Ratios, Auditors' Expectations, Jordan

Authors' individual contribution: Conceptualization — M.A.; Methodology — M.A., A.B., D.E., and T.W.; Investigation — A.B., D.E., T.W., and M.A.; Formal Analysis — M.A., A.B., D.E., and T.W.; Writing — Original Draft — M.A., A.B., D.E., and T.W.; Writing — Review & Editing — M.A.; Supervision — M.A.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

Analytical procedures (AP) are an important type of external audit evidence. Using them, auditors can analyse meaningful trends and relations for financial and related non-financial data by comparing actual data with data from budgets, forecasts, industry

averages, and previous entity data (Porter, Simon, & Hatherly, 2014). The International Standard on Auditing 520 (ISA 520), article 4, defines AP as "evaluations of financial information through analysis of plausible relationships among both financial and non-financial data. Analytical procedures also encompass such investigation as is

necessary of identified fluctuations or relationships that are inconsistent with other relevant information or that differ from expected values by a significant amount" (IAASB, 2009).

AP are useful and valuable to the auditor, as they can be used to assess how reasonable the financial statements are compared to the auditors' expectations, and in some cases provide a broader picture compared to that which may be obtained from detailed substantive audit tests (Trompeter & Wright, 2010). Indeed, AP are in certain circumstances more effective and efficient than other substantive auditing tests (Hirst & Koonce, 1996), especially in the cases of large and varied data and when there is minimal risk of material misstatement in the financial statements (Appelbaum, Kogan, & Vasarhelyi, 2018). Hoitash, Kogan, and Vasarhelyi (2006) report higher prediction accuracy of analytical procedures for larger clients. Indeed, the importance of AP as an external audit procedure has increased during the COVID-19 pandemic given the difficulties involved in performing other substantive tests due to the cost and time involved and the availability of much evidence in the form of emails, in addition to the expected decline in audit fees due to pressure from clients facing decreasing income due to the pandemic (Albitar, Gerged, Kikhia, & Hussainey, 2021).

Given the importance of AP as a major audit procedure that can help in achieving an effective audit in an efficient manner, it would be an attractive method for audit firms worldwide, because even at the detailed substantive level, it is considered the cheapest type of audit evidence (Elder, Beasley, Hogan, & Arens, 2020). However, its performance at the substantive level without appropriate conditions, such as developing precise estimates, availability of reliable sources of information for developing expectations, and availability of effective accounting information systems and other internal controls at the audit clients could lead to meaningless results, and be detrimental to the quality of the external audit. Research on AP and its application have generally covered developed country contexts, but very little research has explored in detail the application of AP in developing countries, including Jordan, where insufficient reliable information, limitations of corporate governance and internal controls, weakness of minority shareholders (Abdullatif & Al-Khadash, 2010; Alhababsah, 2019), the lack of demand for a high-quality external audit (Abdullatif, 2016; Abdullatif & Al-Rahahleh, 2020), and the lack of sufficient monitoring by the Jordanian Association of Certified Public Accountants (JACPA) of compliance with auditing standards (Atmeh, 2016) may lead to deficiencies in the use of this important audit tool and type of evidence.

Jordan, the setting for this study, is a developing country that is characterised by closely-held businesses, including family businesses, and therefore largely concentrated ownership of many businesses even among public listed companies, and limited separation between ownership and management (Haddad, AlShattarat, AbuGhazaleh, & Nobanee, 2015; Abdullatif, 2016; Abdullatif, Alhadab, & Mansour, 2019; Almarayeh et al., 2020; Bataineh, 2021; Gerged, Albitar, & Al-Haddad, 2021). Such a system leads to concerns over the quality of

corporate governance and managerial accountability in such businesses, in addition to concerns over the quality of external auditing, given that such owners are not likely to demand an audit of high quality or to pay a large audit fee (Abdullatif & Al-Khadash, 2010; Abdullatif, 2016; Abdullatif & Al-Rahahleh, 2020; Almarayeh et al., 2020). This is exacerbated by the Jordanian legal environment not providing sufficient protection for minority shareholders, despite the potential high agency conflict between majority and minority shareholders in such environments (OECD & UASA, 2014; Alhababsah, 2019; Alhadab, Abdullatif, & Mansour, 2020; Bataineh, 2021; Gerged et al., 2021). In addition, there is limited litigation risk facing auditors in Jordan, with limited negative consequences of deficient auditor performance (Abdullatif & Al-Khadash, 2010). Finally, in a market characterised by limited activity and limited sources of published information (Abdullatif, 2016), auditors face problems finding information to use in developing their expectations regarding AP and other audit procedures.

Therefore, this study contributes to our knowledge by exploring in detail how AP are applied in the developing country context of Jordan, taking into account the particular characteristics of this context. In doing so, the study employs a qualitative approach, with the researchers conducting in-depth interviews with a sample of experienced Jordanian auditors, asking about the detailed use of AP, such as financial ratios used in AP, the extent of use of AP, reliability of AP, and sources of AP expectations.

The remainder of the paper is as follows. Section 2 reviews the relevant literature on AP. Section 3 provides details of the interview research method used in the study. Section 4 presents the findings of the interview survey. Section 5 discusses these findings, and Section 6 concludes the paper.

2. LITERATURE REVIEW

As a type of audit evidence, AP compare the auditors' expectations about the client's financial statement figures and related financial ratios with actual results. This requires the auditor to develop expectations to base this comparison on (Koskivaara, 2004). Sources for such expectations include data from the industry (i.e., data from the client's competitors), prior-period data from the client, the client's budgets, or related non-financial data (Elder et al., 2020). The use of AP can significantly increase the quality of an audit, particularly when the expectations used are more precise and the deviations from expectations are completely investigated by the audit firm (Asare & Leiby, 2014). Therefore, it is important for the audit firm to develop reliable expectations to be used as benchmarks for comparing expectations with actual data. In addition, it is important that internal controls are reasonably effective in order to use substantive AP, otherwise, substantive tests of details would be more effective (IAASB, 2009).

There are several potential benefits from the AP use. AP can be used to help the auditor understand the client's business and industry, assess the client's likelihood of failure and spot possible misstatements in the client's financial

statements. In addition, when results of AP are reasonable, they can sometimes be used to replace or reduce the use of more costly substantive tests (Elder et al., 2020). Indeed, AP are based on testing the accuracy of financial statement balances without considering the detailed individual transactions that lead to the balances (Koskivaara, 2004), and are therefore generally less costly than other substantive audit tests. In some cases, the use of AP is useful given that detailed evidence from other substantive tests may not be readily available (Asare & Leiby, 2014). When rigorously performed, substantive AP, combined with other audit procedures, can lead to high overall assurance levels (Glover, Prawitt, & Drake, 2015).

According to ISA 315, AP are required to be performed (usually at an aggregated level) as risk assessment procedures and may use both financial and non-financial information (IAASB, 2013). At this stage, AP can be used to identify areas where there are significant risks of material misstatements in the financial statements and to plan further audit procedures based on that (Porter et al., 2014). They can also be used as substantive tests at a detailed level, and are required to be performed near the end of the audit to be used in forming a conclusion on the reasonableness of the financial statements in comparison to the auditors' understanding of the client (IAASB, 2009).

Research on AP has taken several directions. Regarding how auditors deal with AP, Ameen and Strawser (1994) found that auditors tend to use simple AP methods more than sophisticated AP methods and that AP are used extensively in all three stages of an audit (risk assessment, substantive testing, and final stage) given the pressure on audit fees. They also reported that the Big Six audit firms use AP more than other audit firms and that AP are more useful when the clients are recurring and have good internal controls, and when the accounts involved are less risky regarding material misstatements. Similar results regarding the tendency to use simple AP methods were found by Hirst and Koonce (1996), Mahathevan (1997), Mulligan and Inkster (1999), and Cho and Lew (2000). Indeed, Mulligan and Inkster (1999) reported that under the increased use of computers, more AP are performed but still there is an emphasis on more simple AP methods. In a more recent study, Trompeter and Wright (2010) also reported a tendency to use more simple AP methods. However, they reported increased use of AP due to factors including better sources of information for expectation formation (such as industry benchmarks and analyst expectations), the willingness of audit firms to use more AP in order to reduce the use of other substantive testing, and the increased reliability of AP after the application of the Sarbanes-Oxley Act due to better understanding of the client's internal controls.

As for the type of audit firm to use AP to a larger extent, Ameen and Strawser (1994) in the USA, Mahathevan (1997) in Singapore, Mulligan and Inkster (1999) in the UK, Samaha and Hegazy (2010) in Egypt, and Abidin and Baabbad (2015) in Yemen, all reported that Big N audit firms tend to use AP more than other audit firms. However, Pinho (2014), in a study in Portugal, did not find such a difference.

While Ameen and Strawser (1994) reported extensive use of AP in all stages of an audit, other studies showed more AP use in certain audit stages. For example, Cho and Lew (2000), in Hong Kong, reported that the final auditing stage was the one where AP were used most, followed by the risk assessment stage and finally the substantive testing stage. Similar findings were reported in Singapore (Mahathevan, 1997) and Canada (Lin & Fraser, 2003). On the other hand, Pinho (2014) reported that AP are used to the most extent in Portugal during the risk assessment stage of the audit, as auditors are more reserved on the use of AP as substantive tests. In Singapore, Choo, Chua, Ong, and Tan (1997) reported more use of AP by auditors when the client's industry is matured. They also found that while ratio analysis is used in both new and mature industries, trend analysis is used to a larger extent with stable, mature industries.

Very few studies were published using data from developing countries. Such studies include that of Samaha and Hegazy (2010) in Egypt, who found relatively limited use of AP, limited experience of auditors in using AP, and limited trust in using AP as substantive tests. In Jordan, Al Qtaish and Makhlof (2019) surveyed the main ratios used by Jordanian auditors in performing AP and found that while financial ratios were generally used to a limited extent, the most used ratios were earnings per share and the gross profit margin, in addition to the accounts receivable turnover and collection period.

On the effectiveness of specific sophisticated AP methods, Westland (2017) found Poisson-Gamma distributions to be better predictors of future account and transaction values than Gaussian distributions, while Boon Law and Willett (2004) found that statistical regression AP perform better at the transaction level than at the balance level. Regarding the use of artificial neural networks in AP, Li, Fisher, and Falta (2021) found this method to outperform traditional methods (ratio analysis and regression analysis) when dealing with Type II errors (i.e., not investigating a book amount that is incorrect). However, they did not find this method significantly superior to traditional AP methods regarding Type I errors (i.e., rejecting a correctly stated account balance). Indeed, Krambia-Kapardis, Christodoulou, and Agathocleous (2010) found artificial neural networks to be 90% accurate in predicting fraud.

Biggs, Mock, and Simnett (1999) found that auditors are more effective in mitigating bias in their expectations when using data for more than two years to develop expectations regarding account balances. Regarding the bias towards anchoring on the client's expectations, Rose, Rose, Suh, and Thibodeau (2020) suggest that it could be counterproductive to generate many explanations during AP because the increased difficulty perceived by this task would lead to such anchoring, and therefore reduce the assessment of fraud risk, which is an unwanted outcome. Similarly, Trompeter, Carpenter, Desai, Jones, and Riley (2013) argue that overreliance on information provided by the client in developing auditors' expectations could lead to a higher ability of clients to commit and conceal financial statement fraud.

3. RESEARCH METHODOLOGY

This study is an exploratory study that aims to discover how AP are applied in practice by Jordanian auditors. To do so, it employs a qualitative method by using in-depth semi-structured interviews. This research method is favoured due to its suitability for exploratory studies, since it is built on a set of predetermined general interview themes and questions, but is, nevertheless, flexible in terms of the flow of the questions and ability to adjust the scope and depth of the discussion according to the interviewee's preference. In addition, the interviewee could also provide some new issues and dimensions to be discussed at the interview (Hesse-Biber & Leavy, 2011; Saunders, Lewis, & Thornhill, 2016). For this study, an interview survey was preferred to alternative research methods, such as questionnaires, due to the explanatory nature of the study, which requires obtaining in-depth information about the main topics covered in it, rather than just box-ticking (in the case of questionnaires). In addition, the interview approach ensures better access to individuals who possess

sufficient knowledge and experience to provide the information required for the study.

The Big Four audit firms, in addition to other internationally affiliated Jordanian audit firms and local Jordanian audit firms, operate in Jordan. The research population is defined as auditors with high experience and high ranks at auditing firms that audit public listed and/or private listed companies in Jordan. Based on this definition, the researchers managed to interview twelve Jordanian auditors with sufficient experience in external auditing (average 20.4 years). The job titles of the sample include eight partners, two senior managers, one director, and one assistant manager. Of these interviewees, four represent the Big Four audit firms, six represent other internationally affiliated audit firms (including one who was previously a Big Four firm partner), and two represent local Jordanian audit firms. This variety of interviewees covers different types of audit firms and audit clients. This sample size, while relatively small, is considered acceptable given the relative homogeneity of the sampled individuals regarding the research topic (Saunders et al., 2016). Table 1 shows the coding of each interviewee.

Table 1. Backgrounds of the interviewees

Interviewee code	Job title	Experience in external auditing (years)	Audit firm	Duration of interview (minutes)
Int. 1	Senior manager	11	Big Four	46
Int. 2	Assistant manager	6	Big Four	46
Int. 3	Director	16	Big Four	30
Int. 4	Senior manager	12	Big Four	35
Int. 5	Partner	40	International (non-Big Four)*	35
Int. 6	Partner	25	International (non-Big Four)	50
Int. 7	Partner	35	International (non-Big Four)	70
Int. 8	Partner	23	International (non-Big Four)	70
Int. 9	Partner	20	International (non-Big Four)	42
Int. 10	Partner	22	International (non-Big Four)	60
Int. 11	Partner	15	Local	30
Int. 12	Partner	20	Local	60

Note: * the interviewee was previously a partner at a Big Four audit firm.

The main topics covered in the interviews include the use of AP at the different stages of the audit, the most popular financial ratios used in AP, the development of expectations for AP, the extent of using AP, and the use of specialised audit software in performing AP. Appendix, Table A.1 includes the questions asked in the interviews.

The interviews were conducted in November and December 2019. All but one was conducted personally at the workplaces of the interviewees. Most of the interviewees were conducted by all of the research team together, while some were conducted by some of the research team members. The duration of the interviews ranged from 30 to 70 minutes (average of 48 minutes). The interviewees were assured of anonymity of their identities and those of their audit firms. Extensive written notes were taken by the interviewers at each interview, and all but three of the interviews were tape-recorded (three interviewees refused tape-recording). The interviews were conducted in Arabic, and shortly after the interviews, they were transcribed and translated to English for research paper writing-up purposes. The analysis method used was thematic analysis, conducted by grouping similar phrases and words into individual categories. The researchers read the transcripts several times in order to find patterns of similar responses and group them adding relevant direct quotes as needed.

4. FINDINGS

In this section, the main themes and views of the interviewees are discussed. The section starts with the interviewees' use of AP in auditing, then proceeds to discuss the main financial and nonfinancial data used in AP, the sources of expectations for AP, and finally the use of specialised audit software in performing AP.

4.1. The use of AP at different stages of the audit

All of the interviewees agreed on the importance of AP as an audit tool. They all confirmed that AP are used as a mandatory procedure in the planning stage and the final auditing stage, and is optional (based on several factors) as a substantive AP audit test. Int. 12 emphasised the importance of AP by arguing that:

"Auditing is a social science that is subjective and includes many views that may contradict in some cases. If we convert the data into a quantitative form we will be using a quantitative method to better understand matters".

As for the planning stage, the interviewees generally agreed that the main purpose of AP is to form an understanding of the entity's nature

and assess its risks of material misstatements. For example, Int. 1 argued that:

“At the planning stage, we aim to identify the areas of risk of material misstatements. For example, if fixed assets increase by one million JD we have to know why this happened, as there may be an increase in new assets and their depreciation. Similarly, if a company acquires another company, fixed assets will be expected to increase. We, therefore, analyse the assertions provided by the client and determine the risk of material misstatements in the financial statements”.

Similarly, Int. 5 argued that:

“The goal is to build an audit plan and analyse the materiality of the balances at the year-end. Therefore, we annualise the figures in the trial balance then apply vertical analysis. This process is a relatively long process that needs about 50 working hours, and, based on it, we estimate materiality levels. We generally use 5% of net income or 1.5% of total assets”.

However, Int. 6 argued that the use of AP is at a lower degree, and is mainly restricted to horizontal analysis, using the previous balances in the client's income statement and statement of financial position, and comparing them to the current balances to see whether there are any significant differences. He also said that it is important to use annualising and projection of year-end balances since the balances used at the planning stage are based on earlier trial balances such as those of September. This view is relatively different from that of most of the interviewees, who reported some degrees of use of ratio analysis as AP at the planning stage in order to assess the risk of material misstatements in the financial statements.

Regarding the final stage of the audit, the general view of all of the interviewees is that AP are used to assess the reasonableness of the financial statements after completing the audit. AP are generally performed by a partner to make an objective assessment of the financial statements, and, in case of discovery of something suspicious, the partner will probe the matter and do necessary audit procedures to deal with the case.

As for the use of AP as substantive tests, the interviewees reported varying views on the methods used and the extent of their use. This will be discussed in subsequent subsections. However, as a general overview of the procedure used in substantive AP, Int. 3 argued that:

“Substantive AP are usually used for accounts with low risks, such as salaries, interest, and depreciation. We do not only compare figures, but also assess the correctness, completion, and sufficiency of the data. We can also use AP to analyse fluctuation and variances in the client's data”.

Int. 5 also agreed with the above view that substantive AP are useful for auditing salaries and fixed assets, a view generally shared by other interviewees, such as Int. 2, Int. 9., and Int. 12. In addition, several interviewees held views that the use of substantive AP is not mandatory, but may lead to significant cuts in audit cost, therefore prompting them to use it even when recognising that it has some limitations. Int. 4 argued that:

“It is not a must to use substantive AP, but they save time instead of having to take large samples, as with substantive AP the auditor will only analyse numbers, using further testing when there are large differences from the auditor's expectations”.

Similarly, Int. 9 argued that there is no cost associated with AP other than the working hours needed. However, he and several other interviewees argued that the use of AP as a substantive audit procedure should be associated with the quality of the client's internal controls, and has to be used when favourable results emerge from tests of controls. He argued:

“AP are more useful when the client has strong internal controls. However, most companies in Jordan do not have strong internal controls, especially family businesses. Public listed companies have internal control systems but they may be ineffective. Therefore, we need to tests the controls before relying on them”.

4.2. The nature of AP used

As mentioned earlier, most of the interviewees said that they use some form of ratio analysis in their AP. Int. 1, Int. 2, Int. 3, Int. 5, Int. 6, and Int. 10 all said that they do not use particular financial ratios for all cases, since the matter depends on the nature and the characteristics of the client. Nevertheless, some of these interviewees, in addition to several others showed a general preference for some ratios over others.

The most preferred ratio reported by interviewees is the gross margin ratio (Int. 1, Int. 2, Int. 4, Int. 7, Int., 8., Int.11, and Int.12), with justifications including its usefulness and ease of calculation. Other financial ratios mentioned by some interviewees are the liquidity ratios (e.g., current ratio, quick ratio, and working capital) (Int. 3, Int. 4, Int. 7, Int. 8, and Int. 10), given their role in assessing the client as a going concern. Turnover ratios (e.g., sales turnover, inventory turnover, and accounts receivable turnover) were mentioned by some interviewees including Int. 1, Int. 2, Int. 5, and Int. 9, with justifications including their ease of calculation and their relevance to the client's accounts. Finally, Int. 6 argued that he does not use any type of financial ratio analysis due to the lack of local Jordanian benchmarks to use in assessing the calculated figures.

It is notable that none of the interviewees mentioned the use of market-based ratios, including ratios based on market data such as share prices. Possible reasons for this may include mistrust in the market data and objectivity of share prices in a market with limited information, activity, and efficiency (Abdullatif, 2016).

On the other hand, several interviewees (Int. 3, Int. 4, Int. 6, Int. 10, and Int. 11) showed a preference for AP to be based on nonfinancial data. Such data includes tax rates, hotel occupancy rates, number of university students and credit hour rates, area of shopping malls, and quantity of waste in factories. For example, Int. 3 argued that:

“An important matter in auditing is an auditor's understanding of the business sector. If tax and customs rates on cars increase, one would expect a decrease in car sales. If some clients show increases in car sales then this is questionable”.

Similarly, Int. 6 argued that:

“Using AP as a substantive audit test is aplenty. For example, if I audit the financial statements of a hotel, I would use the occupancy rate and multiply this by the number of rooms, then compare this with the amount reported in the financial statements.

Regarding depreciation expense, if I audit the financial statements of a shopping mall, I use the area in square metres and the number and areas of rented locations, then I multiply this by the average rent per square metre”.

As for the extent of use of AP compared to other audit procedures, several interviewees argued that there is no stated percentage since the matter depends on the nature and characteristics of the client, including the effectiveness of the client’s internal controls and availability of trustworthy data. For example, the percentage of use of AP for clients such as banks is likely to be higher than several other types of clients, given that banks are generally likely to have relatively good internal control systems. However, some interviewees reported the use of relatively high percentages of AP on audits in general, with Int. 12 reporting a 40% average percentage of use of AP on audits, and Int. 7 and Int. 8 also arguing that the percentage of their use of AP on audits is relatively high. Int. 7 argued that:

“I would use AP even when a client has weak internal controls, as it may help in revealing findings and reasons for such weaknesses. The general rule is that the presence of an obstacle does not prevent doing a procedure. If you need surgery and the success rate for it is 5%, would you not have it anyway?”

Indeed, some interviewees argued that AP can be considered a reliable audit procedure, especially if data analytics are available for use. However, such methods are currently generally available for only the Big Four audit firms in Jordan (Abu Sham, Al Awamleh, Jaouni, Al Zoubi, & Al Hajaj, 2020). Int. 6 argued that AP using non-financial data can be generally considered effective in addition to its efficiency, while Int. 12 considered AP reliable given that it is more quantitative than other audit procedures. In addition, Int. 8 considered that the results of AP are more accurate and useful for achieving audit objectives than those of other substantive audit procedures and tests of controls. However, Int. 9 showed some concern about the reliability of AP in some cases by arguing that:

“For example, if there is a large fluctuation in monthly sales for a client (e.g., JD 100,000 in a month, JD 1,000,000 in the following month, and JD 500,000 in the third month), this could be because of non-systematic recording. The construction sector is used to a recording based on claims, and sending a claim after completion of a stage of the project, so a client will not have a systematic recording, and AP becomes inapplicable in such a case”.

4.3. Auditors’ expectations used for AP

The major problem concerning applying AP that was reported by all of the interviewees is the lack of sufficient sources that can be used to form expectations. As mentioned earlier, to apply AP properly the auditor should have sufficient information that can be used to form expectations about the client’s figures and financial ratios, which can be then meaningfully compared to the client’s reported figures. Sources for such expectations include the client’s previously reported figures, the client’s budgets, and industry benchmarks (Elder et al., 2020).

However, the interviewees complained that for many clients, only previously reported information is available as a source of information to compare actual reported figures and ratios with. Some interviewees criticised the lack of client budgets or the weak preparation of such budgets. For example, Int. 10 argued that:

“Some Jordanian companies do not estimate budgets correctly, the fact that results in huge variances between actual and estimated figures, if even estimated figures do exist”.

As for industry benchmarks, all of the interviewees were concerned about the general lack of local Jordanian industry benchmarks to be used to compare with the clients’ financial ratios. This problem increases significantly for industries where all or most of the clients are not publicly listed, leading to the lack of comparative data. As a result, some interviewees (Int. 1, Int. 2, Int. 5, Int. 7, Int. 8, and Int. 9) reported the use of international benchmarks to perform AP for local Jordanian clients, although Int. 1 and Int. 9 mentioned that such benchmarks should be used with care and not relied on to a large degree when auditing Jordanian clients, due to the different business context characteristics. Int. 6 argued that the problem is not only the lack of industry benchmarks but also the lack of client benchmarks. He argued that:

“The problem is not only the lack of industry ratios. Even clients themselves do not have clear policies that can help auditors in knowing whether or not their financial ratios are reasonable. For example, regarding the average accounts receivable collection period, if a client has 30 days as a figure, how can I judge the reasonableness of this figure when the client does not have a credit policy?”

In addition, several interviewees argued that their personal experience is their alternative for the lack of local industry benchmarks that can be used to form expectations. For example, Int. 5 argued that:

“For example, if we analyse inventories and accounts receivable for the food industry, the perfume and accessories industry, or the clothes industry, we have to study the inventory turnover. A gross margin of 40% is good, but the turnover ratio is important to analyse inventory obsolescence. For the food industry, an inventory turnover of 20 cannot be good since the ratio should be 50 or higher. This analysis would be useful to expect inventory obsolescence or difficulties in selling inventory”.

4.4. The use of information technology in performing AP

Another major issue with applying AP that was reported by most of the interviewees was the lack of sufficient use of information technology in performing AP. Reasons for this include the lack of availability of suitable audit software, the cost of purchasing such software, and the lack of sufficient client data to be analysed using this software.

Several interviewees (Int. 5, Int. 9, Int. 10, Int. 11, and Int. 12) mentioned that a major problem faced by auditors willing to apply information technology in performing AP is the lack of availability of suitable audit software for such purposes in Jordan, and/or its high cost compared to its perceived benefits. Some interviewees (Int. 5,

Int. 9, and Int. 12) mentioned that they are mainly restricted to the use of EXCEL as computer software for AP, despite the clear limitations of this programme for AP purposes (Int. 3 and Int. 5 even argued that some clients do not provide data on EXCEL format), while Int. 7 mentioned that his audit firm developed its own software locally. It is generally expected that such software will not match the quality of international software used by the Big Four audit firms. Therefore, and taking into account that data analytics were very recently employed by the Big Four audit firms in Jordan (Abu Sham et al., 2020) only interviewees from the Big Four audit firms in Jordan (Int. 1, Int. 2, Int. 3, and Int. 4) mentioned any use of data analytics in performing AP. However, even these interviewees reported problems with applying data analytics, such as the lack of suitability of some clients' data, resistance and weak cooperation of clients in providing data for data analytic AP, and even resistance by some auditors themselves. As for resistance of Jordanian auditors to apply AP, Int. 12 argued that:

"We do not have computerised programmes more developed than EXCEL. The JACPA attempted to develop an audit programme but did not succeed due to weak demand by auditors themselves".

In addition to the cost and availability of specialized audit software for AP, a major problem mentioned by several interviewees (Int. 1, Int. 2, Int. 3, Int. 4, and Int. 9) as a limitation to using information technology in performing AP is the quality and/or suitability of the client's data for analysing by the software, and/or the willingness of the client to cooperate with the audit firm regarding the data. The limitations they mentioned include the data being restricted in volume, incorrect, not suitable for analysis, not conforming to International Financial Reporting Standards (IFRSs), or even available only in Arabic. For example, Int. 4 argued that:

"Applying auditing software in Jordan is a challenging task, as not all companies are capable of providing auditors with everything they ask for since these companies do not have an ERP system".

The above quote was made by Int. 4, a Big Four auditor. If this problem applies to the Big Four audit firms, then it is expected to apply more severely to the non-Big Four audit firms in Jordan.

5. DISCUSSION

All of the interviewees agreed that AP are performed in the planning stage of the audit in order to gain a general understanding of the client's financial statements and to identify any areas of potential material misstatements in them. As for the final audit stage, AP are performed for the purpose of ensuring the reasonableness of the client's financial statements after completing the audit. However, the interviewees did vary in terms of their views on the reliability of AP as a substantive audit test. For example, several interviewees (Int. 1, Int. 2, Int. 3, Int. 4, Int. 6, and Int. 9) argued that the reliability of AP is related to the accuracy of the data analysed and the effectiveness of the clients' internal controls. However, some interviewees (Int. 6, Int. 10, and Int. 11) argued that AP are limited in reliability due to the lack of reliable benchmarks to

build expectations on, while some other interviewees argued that AP are highly reliable due to their accuracy (Int. 8) and ability to discover weaknesses in internal controls (Int. 7), or simply due to AP being a quantitative method (Int. 12). Nevertheless, most of the interviewees appreciated the use of AP in general, given their simplicity (Int. 4, Int. 7, Int. 8, Int. 9, and Int. 12) and low cost compared to the benefit expected from their application (Int. 1, Int. 2, Int. 4, Int. 6, Int. 8, Int. 9, and Int. 12). Several interviewees (Int. 7, Int. 8, and Int. 12) reported high levels of use of AP in their audits, despite AP being an optional tool as a substantive audit test, and despite the numerous risks associated with AP, which would limit the reliability and credibility of external audits based on high levels of AP. Such risks include clients having weak internal controls and accounting information systems (Int. 1, Int. 2, Int. 4, Int. 5, Int. 7, Int. 8, and Int. 9), the lack of suitable data for AP application (Int. 1, Int. 2, Int. 3, Int. 4, Int. 5, Int. 9, Int. 10, and Int. 11), the lack of sufficient use of audit software in AP analysis (Int. 4, Int. 5, Int. 9, Int. 10, Int. 11, and Int. 12), and the lack of reliable benchmarks to base audit expectations on (all interviewees).

The interviewees reported somewhat varied views on which financial ratios were more applicable for AP, with some interviewees (Int. 1, Int. 2, Int. 4, Int. 7, Int. 8, Int. 11, & Int. 12) showing a preference for the gross margin percentage (a result similar to that of Al Qtaish and Maklouf, 2019), in addition to turnover ratios (Int. 1, Int. 2, Int. 5, and Int. 9) and liquidity ratios (Int. 3, Int. 4, Int. 7, Int. 8, and Int. 10). However, several interviewees (Int. 1, Int. 2, Int. 3, Int. 5, Int. 6, and Int. 10) argued that despite their preferences, their choice of ratios is made on a case-by-case basis, depending on the characteristics of the client. In addition, several interviewees (Int. 3, Int. 4, Int. 6, Int. 10, and Int. 11) supported using non-financial information for AP, given that the sources for such data are generally considered more trustworthy. Indeed, since client-generated financial data may suffer from weaknesses of the internal controls that generated it, non-financial data (e.g., data published by the government or industry bodies) is likely to be in many cases more reliable for assessing the reasonableness of a client's financial data. Indeed, some non-financial data from clients themselves (e.g. areas of buildings) may be in some cases more reliable for assessing the reasonableness of the client's financial data than comparing the financial data with other client-generated financial data.

In summary, the main problems that make the application of AP less reliable are the limited effectiveness of some clients' internal controls (Int. 1, Int. 2, Int. 4, Int. 5, Int. 7, Int. 8, and Int. 9), the lack of availability of specialised software to use in analysing data for AP purposes (Int. 4, Int. 5, Int. 9, Int. 10, Int. 11, and Int. 12), the limited quality of data provided by some clients (Int. 1, Int. 2, Int. 3, Int. 4, Int. 5, Int. 9, Int. 10, and Int. 11), and the lack of local industry benchmarks that can be used in developing reliable estimates to be used for comparison with the clients' financial statement data (all interviewees).

It can therefore be concluded from the findings of this study that in general external auditors in Jordan do prefer and use AP to a relatively large

extent as a substantive audit test, even when facing some risks that could lead to undermining the credibility of their audits. As mentioned earlier, most audit clients in Jordan are closely held and do not tend to require an external audit of high quality. In addition, there are no sufficiently serious negative consequences for auditors who violate some of their responsibilities under audit standards (Abdullatif & Al-Khadash, 2010). This may lead some auditors to take the risks associated with extensive use of AP and their potential effects on the quality of the audit, in an attempt to save some costs of the audit, especially given the relatively low audit fees in Jordan and the fear of losing audit clients (Abdullatif & Al-Khadash, 2010; Abdullatif, 2016). From an institutional theory lens, these findings can be associated with the need to apply the ISAs (including ISA 520 on AP) under coercive, mimetic, and normative pressures (i.e., the need to apply ISAs as a legal requirement, and to mimic practices of international audit firms and practices considered by many professionals as best practice) (Al-Omari, 2010; Kholeif, 2010; Bananuka, Kadaali, Mukyala, Muramuzi, & Namusobya, 2019; Abdullatif & Al-Rahahleh, 2020). However, auditors may tend to decouple by reporting face application of ISAs, when in fact this application is not at a sufficient level due to different factors discussed earlier (see Al-Htaybat, 2018 for concerning decoupling on IFRSs application in Jordan; Abdullatif and Al-Rahahleh, 2020 for concerning decoupling on ISAs application in Jordan).

6. CONCLUSION

This study aims at exploring the application of AP by Jordanian auditors. To do so, it employed an interview survey approach, using semi-structured interviews with twelve experienced Jordanian auditors. The main findings of the study include views that AP are considered generally applicable in Jordan, despite several limitations on their application, such as the limited effectiveness of some clients' internal controls, the lack of availability of specialised software to use for AP purposes, the limited quality of data provided by some clients, and, most notably, the lack of local

industry benchmarks that can be used in developing reliable estimates to be used for comparison with client data.

As for the implications of the findings of this study for the practice of auditing in Jordan, the researchers recommend that the Jordanian regulatory authorities and any industry regulating associations work on issuing and frequently updating local Jordanian industry benchmarks that can be used by auditors to form expectations needed for proper application of AP. The need for such benchmarks becomes even more important when most of the companies in an industry are not publicly listed, due to the lack of comparative financial statements of competitors in that industry. In addition, regulators and professional associations such as the JACPA and the Jordan Securities Commission (JSC) are recommended to increase their efforts in promoting the use of specialised audit software by auditors when performing AP, and providing adequate training to auditors who need it, in order to make the application of AP of a higher standard of quality. Finally, the researchers recommend that the JSC and other company regulators in Jordan increase their monitoring of the quality of the information in the financial statements of audit clients, especially publicly listed and privately listed companies, to ensure that AP can be applied with more reliability, leading to higher credibility of external audits in Jordan.

As for the potential limitations of this study, the main issue may arguably be the relatively small size of the study sample. While the researchers tried to arrange additional interviews, this was not always possible, due to some auditors they approached refusing to be interviewed. However, the relative similarity of the responses of the interviewees arguably makes the issue of generalising the findings over the Jordanian context acceptable.

Avenues for future research on the study topic include replicating the study in similar developing country contexts and comparing the findings with these of Jordan. In addition, with the emergence of using data analytic tools by audit firms, a possible future study could emphasise the effectiveness and efficiency of using data analytics for AP purposes by Jordanian external auditors.

REFERENCES

1. Abdullatif, M. (2016). Auditing fair value estimates in developing countries: The case of Jordan. *Asian Journal of Business and Accounting*, 9(2), 101-140. Retrieved from <https://ajba.um.edu.my/article/view/2730>
2. Abdullatif, M., & Al-Khadash, H. A. (2010). Putting audit approaches in context: The case of business risk audits in Jordan. *International Journal of Auditing*, 14(1), 1-24. <https://doi.org/10.1111/j.1099-1123.2009.00400.x>
3. Abdullatif, M., & Al-Rahahleh, A. S. (2020). Applying a new audit regulation: Reporting key audit matters in Jordan. *International Journal of Auditing*, 24(2), 268-291. <https://doi.org/10.1111/ijau.12192>
4. Abdullatif, M., Alhadab, M., & Mansour, I. (2019). Determinants of related party transactions in Jordan: Financial and governance factors. *Australasian Accounting, Business and Finance Journal*, 13(1), 44-75. <https://doi.org/10.14453/aabfj.v13i1.4>
5. Abidin, S., & Baabbad, M. A. (2015). The use of analytical procedures by Yemeni auditors. *Corporate Ownership and Control*, 12(2), 17-25. <https://doi.org/10.22495/cocv12i2p2>
6. Abu Sham, M., Al Awamleh, M., Jaouni, R., Al Zoubi, R., & Al Hajaj, S. (2020). *The application of data analytics tools by the Big Four audit firms in Jordan* (Graduation project, Princess Sumaya University for Technology).
7. Al Qtaish, H. F., & Makhlof, M. H. (2019). The extent of use of analytical procedures by external auditors in Jordan in the light of ISA 520. *International Journal of Economics and Finance*, 11(3), 77-88. <https://doi.org/10.5539/ijef.v11n3p77>
8. Albitar, K., Gerged, A. M., Kikhia, H., & Hussainey, K. (2021). Auditing in times of social distancing: The effect of COVID-19 on auditing quality. *International Journal of Accounting and Information Management*, 29(1), 169-178. <https://doi.org/10.1108/IJAIM-08-2020-0128>

9. Alhababsah, S. (2019). Ownership structure and audit quality: An empirical analysis considering ownership types in Jordan. *Journal of International Accounting, Auditing and Taxation*, 35, 71-84. <https://doi.org/10.1016/j.intaccudtax.2019.05.006>
10. Alhadab, M., Abdullatif, M., & Mansour, I. (2020). Related party transactions and earnings management in Jordan: The role of ownership structure. *Journal of Financial Reporting and Accounting*, 18(3), 505-531. <https://doi.org/10.1108/JFRA-01-2019-0014>
11. Al-Htaybat, K. (2018). IFRS adoption in emerging markets: The case of Jordan. *Australian Accounting Review*, 28(1), 28-47. <https://doi.org/10.1111/auar.12186>
12. Almarayeh, T. S., Aibar-Guzman, B., & Abdullatif, M. (2020). Does audit quality influence earnings management in emerging markets? Evidence from Jordan. *Revista de Contabilidad/Spanish Accounting Review*, 23(1), 64-74. <https://doi.org/10.6018/rcsar.365091>
13. Al-Omari, A. M. (2010). The institutional framework of financial reporting in Jordan. *European Journal of Economics, Finance and Administrative Sciences*, 22(1), 32-50.
14. Ameen, E. C., & Strawser, J. R. (1994). Investigating the use of analytical procedures: An update and extension. *Auditing: A Journal of Practice and Theory*, 13(2), 69-76. Retrieved from <https://mays.tamu.edu/research/investigating-the-use-of-analytical-procedures-an-update-and-extension/>
15. Appelbaum, D. A., Kogan, A., & Vasarhelyi, M. A. (2018). Analytical procedures in external auditing: A comprehensive literature review survey and framework for external audit analytics. *Journal of Accounting Literature*, 40, 83-101. <https://doi.org/10.1016/j.acclit.2018.01.001>
16. Asare, S. K., & Leiby, J. (2014). Analytical procedures. In D. Hay, W. R. Knechel, & M. Willekens (Eds.), *The Routledge companion to auditing* (pp. 219-229). <https://doi.org/10.4324/9780203094921.ch17>
17. Atmeh, M. (2016). The players in the accountancy profession and their roles: The case of Jordan. *International Journal of Business and Management*, 11(3), 64-72. <https://doi.org/10.5539/ijbm.v11n3p64>
18. Bananuka, J., Kadaali, A. W., Mukyala, V., Muramuzi, B., & Namusoby, Z. (2019). Audit committee effectiveness, isomorphic forces, managerial attitude and adoption of International Financial Reporting Standards. *Journal of Accounting in Emerging Economies*, 9(4), 502-526. <https://doi.org/10.1108/JAEE-08-2018-0084>
19. Bataineh, H. (2021). The impact of ownership structure on dividend policy of listed firms in Jordan. *Cogent Business and Management*, 8(1), 1-18. <https://doi.org/10.1080/23311975.2020.1863175>
20. Biggs, S. F., Mock, T. J., & Simnett, R. (1999). Analytical procedures: Promise, problems and implications for practice. *Australian Accounting Review*, 9(17), 42-52. <https://doi.org/10.1111/j.1835-2561.1999.tb00098.x>
21. Boon Law, S., & Willett, R. (2004). The ability of analytical procedures to signal transaction errors. *Managerial Auditing Journal*, 19(7), 869-888. <https://doi.org/10.1108/02686900410549402>
22. Cho, S., & Lew, A. Y. (2000). Analytical review applications among large audit firms in Hong Kong. *Managerial Auditing Journal*, 15(8), 431-438. <https://doi.org/10.1108/02686900010354736>
23. Choo, T. M., Chua, M. K., Ong, C. B., & Tan, T. H. (1997). Analytical procedures for new and matured industries. *Managerial Auditing Journal*, 12(3), 123-134. <https://doi.org/10.1108/02686909710160997>
24. Elder, R. J., Beasley, M. S., Hogan, C. E., & Arens, A. A. (2020). *Auditing and assurance services: International perspectives* (17th ed.). Essex, UK: Pearson Education Limited.
25. Gerged, A. M., Albitar, K., & Al-Haddad, L. (2021). Corporate environmental disclosure and earnings management — The moderating role of corporate governance structures. *International Journal of Finance and Economics*. Advance online publication. <https://doi.org/10.1002/ijfe.2564>
26. Glover, S. M., Prawitt, D. F., & Drake, M. S. (2015). Between a rock and a hard place: A path forward for using substantive analytical procedures in auditing large P&L accounts: Commentary and analysis. *Auditing: A Journal of Practice and Theory*, 34(3), 161-179. <https://doi.org/10.2308/ajpt-50978>
27. Haddad, A. E., AlShattarat, W. K., AbuGhazaleh, N. M., & Nobanee, H. (2015). The impact of ownership structure and family board domination on voluntary disclosure for Jordanian listed companies. *Eurasian Business Review*, 5(2), 203-234. <https://doi.org/10.1007/s40821-015-0021-5>
28. Hesse-Biber, S. N., & Leavy, P. (2011). *The practice of qualitative research* (2nd ed.). Thousand Oaks, CA: SAGE Publications Inc.
29. Hirst, D. E., & Koonce, L. (1996). Audit analytical procedures: A field investigation. *Contemporary Accounting Research*, 13(2), 457-486. <https://doi.org/10.1111/j.1911-3846.1996.tb00511.x>
30. Hoitash, R., Kogan, A., & Vasarhelyi, M. A. (2006). Peer-based approach for analytical procedures. *Auditing: A Journal of Practice and Theory*, 25(2), 53-84. <https://doi.org/10.2308/aud.2006.25.2.53>
31. International Auditing and Assurance Standards Board (IAASB). (2009). *International Standard on Auditing 520: Analytical procedures*. Retrieved from <https://www.ifac.org/system/files/downloads/a026-2010-iaasb-handbook-isa-520.pdf>
32. International Auditing and Assurance Standards Board (IAASB). (2013). *International Standard on Auditing 315 (Revised), identifying and assessing the risks of material misstatement through understanding the entity and its environment*. Retrieved from https://www.iaasb.org/system/files/meetings/files/20130415-IAASB-Agenda_Item_5-D_Disclosures%20-%20ISA%20315%20%28Revised%29%20for%20reference%20ONLY.pdf
33. Kholeif, A. (2010). A new institutional analysis of IFRS. In M. Tsamenyi, & S. Uddin (Eds.), *Research in accounting in emerging economies* (Volume 10, pp. 29-55). [https://doi.org/10.1108/S1479-3563\(2010\)0000010007](https://doi.org/10.1108/S1479-3563(2010)0000010007)
34. Koskivaara, E. (2004). Artificial neural networks in analytical review procedures. *Managerial Auditing Journal*, 19(2), 191-223. <https://doi.org/10.1108/02686900410517821>
35. Krambia-Kapardis, M., Christodoulou, C., & Agathocleous, M. (2010). Neural networks: The panacea in fraud detection? *Managerial Auditing Journal*, 25(7), 659-678. <https://doi.org/10.1108/02686901011061342>
36. Li, S., Fisher, R., & Falta, M. (2021). The effectiveness of artificial neural networks applied to analytical procedures using high level data: A simulation analysis. *Meditari Accountancy Research*. Advance online publication. <https://doi.org/10.1108/MEDAR-06-2020-0920>
37. Lin, K. Z., & Fraser, I. A. M. (2003). The use of analytical procedures by external auditors in Canada. *Journal of International Accounting, Auditing and Taxation*, 12(2), 153-168. <https://doi.org/10.1016/j.intaccudtax.2003.08.002>
38. Mahathevan, P. (1997). Auditors' use and perception of analytical procedures: Evidence from Singapore. *International Journal of Auditing*, 1(3), 225-239. <https://doi.org/10.1111/1099-1123.00025>

39. Mulligan, C., & Inkster, N. (1999). The use of analytical procedures in the United Kingdom. *International Journal of Auditing*, 3(2), 107-120. <https://doi.org/10.1111/1099-1123.00052>
40. Organisation for Economic Co-operation and Development (OECD), & Union of Arab Securities Authorities (UASA). (2014). *Guide on related party transactions in the MENA region*. Retrieved from <https://www.oecd.org/daf/ca/GuideonRelatedPartyTransactionsMENA2014.pdf>
41. Pinho, C. (2014). The usefulness of analytical procedures: An empirical approach in the auditing sector in Portugal. *International Journal of Business and Social Research*, 4(8), 24-33. Retrieved from <https://repositorioaberto.uab.pt/bitstream/10400.2/3369/1/578-1747-1-PB.pdf>
42. Porter, B., Simon, J., & Hatherly, D. (2014). *Principles of external auditing* (4th ed.). Chichester, UK: John Wiley & Sons, Ltd.
43. Rose, A. M., Rose, J. M., Suh, I., & Thibodeau, J. C. (2020). Analytical procedures: Are more good ideas always better for audit quality? *Behavioral Research in Accounting*, 32(1), 37-49. <https://doi.org/10.2308/bria-52512>
44. Samaha, K., & Hegazy, M. (2010). An empirical investigation of the use of ISA 520 “analytical procedures” among Big 4 versus non-Big 4 audit firms in Egypt. *Managerial Auditing Journal*, 25(9), 882-911. <https://doi.org/10.1108/02686901011080053>
45. Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students* (7th ed.). Essex, UK: Pearson Education Limited.
46. Trompeter, G. M., & Wright, A. (2010). The world has changed — Have analytical procedure practices? *Contemporary Accounting Research*, 27(2), 669-700. <https://doi.org/10.1111/j.1911-3846.2010.01021.x>
47. Trompeter, G. M., Carpenter, T. D., Desai, N., Jones, K. L., & Riley, R. A., Jr. (2013). A synthesis of fraud-related research. *Auditing: A Journal of Practice and Theory*, 32(1), 287-321. <https://doi.org/10.2308/ajpt-50360>
48. Westland, J. C. (2017). An empirical investigation of analytical procedures using mixed distributions. *Intelligent Systems in Accounting, Finance and Management: An International Journal*, 24(2), 111-124. <https://doi.org/10.1002/isaf.1405>

APPENDIX

Table A.1. The interview questions

No.	Question
1.	How do you view AP and their importance to the audit process?
2.	Please give us details about how you use AP in the stage of planning and understanding the client's business.
3.	Please give us details about how you use AP as a substantive test.
4.	Please give us details about how you use AP in the stage of final audit procedures.
5.	Please give us details about how you use financial ratios and non-financial data for applying AP.
6.	Please give us details about how you develop your expectations for AP.
7.	Please give us details about your use of specialised audit software when performing AP.
8.	Please discuss any limitations facing you when using AP in auditing.