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-RESEARCH ARTICLE-

ANALYTICAL PROCEDURES – ARE THEY USEFUL FOR AUDITING PURPOSES? AN IBERIAN PENINSULA APPROACH

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─Abstract─

The use of analytical audit procedures has been reinforced in view of the increase in the number and complexity of transactions of the audited entities. Previous studies indicate that its use is more significant in the planning and opinion formation phases. Even so, the growing use of software to support audit work has reinforced its usefulness in the phase of collecting audit evidence. To complement those conclusions, the investigation of this article is: in which areas analytical procedures are more suitable for use as evidence gathering? In fact, several studies have been carried out to understand the usefulness of analytical procedures during the different steps of a financial audit, but there is a lack of studies concerning in what financial statements / auditing areas such procedures are more likely to be useful. This study focused on a survey carried out with auditing partners from Big4 audit firms in the Iberian Peninsula, to obtain their perception of the areas of work in which analytical procedures are most frequently used as evidence collection. The results obtained, based on statistical descriptive analysis and confidence intervals prepared at a 95% level of confidence, point to the fact that analytical procedures are mostly used in areas of work related to the Profit & Loss.

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Vol: 14 **No:** 03 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

Account, particularly in the areas of (i) Sales / Customers, (ii) Purchases / Suppliers, (iii) Personnel Expenses and (iv) Income / Financial Expenses. At a significantly lower level, it is shown that in the areas of the Balance Sheet the use of analytical procedures is considered in a much lesser degree. Furthermore, it appears that the typology of analytical procedures used in these areas correspond mainly to comparison tests, trend analysis, ratio analysis, reasonability tests, all those categorized to be less complex analytical procedures.

Keywords: Financial Auditing, Analytical Procedures, Assurance

1. INTRODUCTION

In the current economic context, reinforcing the security of users of financial information produced by reporting entities is a growing concern of the community in general. Therefore, the inevitability of refining auditing techniques is imperative given the growing complexity of accounting processes and transactions. to report. Due to the complexity, audit risk, that is the risk that an auditor issues an inappropriate opinion, tends to increase in current days.

In recent years, financial auditing has followed a risk-based approach in which the nature, timing, and extent of planned procedures stem from the assessment of the accounts or classes of transactions most likely to misstate (Cushing et al., 1995). The traditional analysis of audit risk establishes that such risk is a function of inherent risk, control risk and detection risk, assuming the independence between these three components. More recently, inherent risk and control risk have been combined as to be together identified as material distortion risk (Barros, 2006; Messier Jr et al., 2000). Such approach has been endorsed by the International Standard on Auditing (ISA's).

Audit procedures arise from the need for the auditor to manipulate detection risk to keep the overall audit risk acceptably low, in view of the objectives outlined for the audit work. For those accounts or classes of transactions where the material distortion risk is high, detection risk must be reduced, implying that the auditor must perform more extensive and timely tests (Barros, 2006; Messier Jr et al., 2000). Thus, detection risk may be defined as the probability that an auditor will fail to find material misstatements in an entity's financial statements. These misstatements may be caused by fraud or error. Auditors use audit procedures to detect such misstatements. In this perspective, for accounting items or transaction classes where the identified material distortion risk is high, the detection risk should be reduced, implying, as such, that the auditor should carry out more extensive and timelier tests, in other words, tests that are less efficient, as they consume more resources (audit engagement hours). The pressure to carry out more efficient and effective audits, using the least level of resources and ensuring an adequate level of security for audit users is evident (Messier, 1995; Opoku et al., 2019; Sullivan, 1985; Tabor, 1985). Apostolou et al. (1993) and McDaniel (1990) show that

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

there appears to be a compromise between efficacy in auditing and efficiency in the use of resources in auditing.

Thus, the use of analytical audit procedures has been taking on increasing relevance insofar as their reduced consumption of time resources, providing relevant evidence for the auditor to support his opinion and reduce detection risk. Yet, Tandy (1992) emphasizes the relevance of the quality of the information systems of the audited entities in order to produce credible information to allow an adequate use of analytical procedures. These previous studies carried out, about the increased need to use analytical procedures do not approach, however, in what accounting / audit areas such procedures are to be used. In fact, there is a significant lack of studies that point where those procedures may be applied, without compromising the effectiveness of the audit work, and promoting efficiency in resources usage.

In this perspective, this article investigates in which areas such commitment is more accurately guaranteed, that is, in which areas of the financial statements the auditors tend to develop more analytical procedures as a way of guaranteeing reasonable evidence to corroborate the assertions contained in the financial statementsThe study is based on a survey carried out with auditors working in the Iberian Peninsula, which aims to understand the use of analytical procedures by area of financial statements / audit work and which analytical procedures are in fact effective in these areas. The article begins with a chapter that develops the definition and characterization of analytical procedures in order to create a framework to develop the study. On a following steps, it is made a literature review about analytical procedures in financial auditing, having in mind that there has been identified a lack of previous investigations in the specific identification of financial statement / auditing areas whereas such procedures are applicable. Afterwards it is defined the methodology that was adopted to develop the study, and the results obtained and its descriptive analysis. Finally, and based on the results obtained, the conclusions and implications of the work developed are set, as well as future research proposal regarding the issue analysed in the present article.

2. DEFINITION OF ANALYTICAL PROCEDURES

According to the international referential in this area - International Standard on Auditing 520 - Analytical Procedures (ISA 520), these procedures correspond to assessments of financial information deriving from analysis of the plausible relationships between financial and non-financial data as well as investigations into fluctuations and identified relationships that are inconsistent with other relevant information or that differ from expected values by a significant amount.

According to the above-mentioned ISA 520, analytical procedures can be divided into two main categories:

Vol: 14 **No:** 03 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

(i) Comparisons of financial information, including information from previous years, comparisons with the auditor's budgets or predictions or even ratios (relationships) between the entity under audit and sectoral values for similar-sized companies; and

(ii) The establishment of relationships between the financial data of the company under audit (including gross income, gross added value, asset profitability) or between financial data and non-financial data (such as average salaries).

According to paragraph 7 of ISA 520 the use of analytical audit procedures should also incorporate the following basic goals:

a) "As risk-assessment procedures in order to understand the entity and its environment.

b) As substantive procedures when their use might be more effective or efficient than detail tests in reducing to an acceptably low level the risk that the claims have been materially distorted.

c) As an overall review of financial statements in the final phase of the audit."

Looking at these initial considerations regarding analytical audit techniques in more detail, according to Arens (2008), analytical audit procedures are composed of:

- Comparison of the entity data with data from the sector;
- Comparison of the entity data from the period with data from the past;
- Comparison of the entity data with budgetary data or data estimated by the entity;
- Comparison of the entity data with estimates carried out by the auditor;
- Comparison of the entity data with the data expected according to non-financial data.

This approach suggested by Arens (2008), based on comparative procedures, is specified in the context of the above-mentioned ISA 520 which states in its third paragraph that analytical procedures:

"...are 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."

Also, Costa (2018), states that the techniques associated with analytical procedures constitute one of the greatest challenges in auditing. Nevertheless, this author refers that its usage in not widely spread, as they require developed software and, in some cases, deep mathematical knowledge which is not yet the case throughout the Iberian Peninsula.

Vol: 14 **No:** 03 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

Complementing these approaches with what is exposed in the Audit Guide 2021 of the American Institute of Certified Public Accountants (AICPA), analytical audit procedures can be classified into the following typologies, according to their nature:

- Account or segment of accounts analysis;
- Tendency analysis;
- Financial ratios analysis;
- Reasonability or variability analysis;
- Statistical regression models; and
- Scanning tests.

The sequence suggested here points to an ordering from less complex to more complex analytical procedures in terms of modelling and degree of mathematical and statistical sophistication (Blocher et al., 1993). The studies carried out by Ameen et al. (1994), Fraser et al. (1997) and Mulligan et al. (1999), in which it is objectively concluded that the use of so-called more complex analytical procedures is not common, so that the auditor's professional judgment in the use of less elaborate tests has a decisive role in the conclusions drawn by via the use of this type of test.

On the contrary, other studies developed to date point to the fact that the effectiveness and efficiency of analytical procedures largely depend on their nature (Wheeler, 1988). In these studies, it is concluded that, in fact, more complex procedures (such as regression analysis) are more effective and efficient than more rudimentary procedures (such as comparisons between years or ratios). Notwithstanding the divergence implicit in the works mentioned above, in practice, auditors tend to resort more frequently to so-called more rudimentary procedures, according to studies published by Knechel (2007), Wilson et al. (1989), Wheeler (1988), Ameen et al. (1994) and Fraser et al. (1997). The reasons underlying this evidence have to do, as a rule, with the reduced experience of the auditor who ensures the field work, with the quality of the information generated by the audit client and with the very dimension of the audit work, which is often not justifies the use of more sophisticated procedures (Higson, 1997; Schmutte, 1990).

3. LITERATURE REVIEW

Prior studies point to the fact that analytical procedures are most widely used in the planning phase and the conclusion phase (Pinho, 2014), rather than in the evidence gathering phase. Nevertheless, as mentioned above, the increasing pressure to develop more efficient audit works, not compromising its efficacy, tend to enlarge increasingly the usage of such procedures as evidence gathering. The use of analytical procedures in the evidence gathering phase, sometimes in combination with other substantive detailed procedures, has the objective to validate that the financial information is free from

material misstatement (Messier, 1995), that is, that the audit risk is lowered by auditing procedures adopted by auditors.

In the evidence collection phase, the use of analytical procedures has to do with the collection of elements that corroborate the assertions contained in the financial statements according to the risk assessed in the planning phase. The auditor's decision to use analytical procedures is based on his/her professional judgment that the use of such procedures, per se, or in combination with substantive detail procedures, are efficient and effective in reducing the detection risk for an acceptably low level. At this particular point, the applicable regulations emphasize the following critical factors:

(i) The auditor's assessment of the applicability of analytical procedures taking into account the assertions;

(ii) The reliability of the internal and external data from which the pre-established relationships were developed; and

(iii) The robustness of internal controls, which largely interferes with the effectiveness of analytical audit procedures.

Regarding the first aspect, it should be noted that analytical procedures are, as a rule, applicable to large volumes of transactions, with some degree of future predictability. This type of procedures must be used for the assertions of completeness, accuracy and occurrence of transactions. However, its use should take into account the degree of risk of material misstatement assessed at the planning stage, given that if the estimated risk for a given assertion is high, then more substantive detailed procedures should be used. In fact, this determination of ISA 520 - Analytical Procedures, is in line with ISA 330 - Auditor's Procedures in Response to Assessed Risks, in which it is explicit that in the presence of significant risks of material misstatement, the auditor should emphasize the use of substantive detail procedures, or a combination of these with analytical procedures, being the exclusive use of the latter strongly discouraged.

Regarding the second question, the source of the data collected must be taken into account, as data obtained by external entities are generally more reliable than data collected internally (eg external confirmations of balances). It also highlights, in this particular aspect, the comparability of the available information and the degree to which sectoral data may have to be completed in order, eventually, to be compared with the data of the company to be audited, which may have specific particularities of that entity. If the data in question are composed of budgets, the auditor must take into account the degree of precision in preparing them and the controls implemented for their preparation.

Finally, regarding the third critical factor, the analytical procedures will be all the more effective, the more robust the internal control procedures planned and implemented. It follows from this point that if there are no effective internal control procedures in use by the entity, then the auditor should give greater weight to the use of substantive detail

procedures. According to Fraser et al. (1997) in the execution phase of evidence collection, analytical procedures have the primary function of reducing the number and extent of substantive detail procedures. Boynton et al. (2005) highlight that if the use of analytical procedures in the planning phase and in the conclusion phase of the audit work is unavoidable, even because the auditing standards in force point to this, as the collection of evidence is strongly recommended insofar as they present cost-effectiveness for the auditor and can provide corroborating evidence in many cases.

In particular, research works about the use of analytical audit procedures carried out in the United Kingdom (Fraser et al., 1997), in Canada (Lin et al., 2003) and in Portugal (Pinho, 2014), concluded that it is at this stage that auditors least use the use of analytical procedures, compared to the planning phase and the final review phase of the audit work. It was also found in these works, that the largest auditing companies resort significantly more to these procedures at this stage than medium and small companies. These authors justify this finding with the fact that there is greater pressure for cost reduction and efficiency gains in large auditing companies and that the companies audited by them usually have more developed information and accounting systems, which allows them to auditors work with the information using computer auditing tools. Despite the conclusions of the aforementioned research work, in a work carried out in the USA by the Public Oversight Board's Panel (2000) on audit effectiveness, it is concluded that 20% of the evidence collected by auditors is based on analytical procedures, from which concludes that its use is extensive and growing within the scope of audit work.

In the United Kingdom, partners involved in audit work confirm, in an empirical study carried out by Fraser et al. (1997), that 40% of materially relevant errors, that is, capable of modifying the auditor's opinion, were detected through the use of analytical procedures. In the same vein, Kreutzfeldt et al. (1990) carried out a similar empirical study in the United States of America, having concluded that, coincidentally, exactly 40% of the errors detected had been detected using analytical audit procedures. Finally, in another work developed by Hylas et al. (1982), opinions issued by independent auditors were analysed, on which the authors concluded that in 27% of the cases, qualifications contained in the audit opinion had as supporting evidence conclusions drawn through of analytical audit procedures. However, this usefulness in the use of analytical audit procedures is far from consensual. Other studies (Coakley, 1982; Loebbecke et al., 1987) argue that the usefulness of analytical procedures in the evidence gathering phase is limited, since auditors tend not to reduce the use of procedures detail substantives at this stage, even if they use analytical audit procedures. Cohen et al. (1989) justify this conservative attitude on the part of auditors with the professional scepticism inherent in the audit profession itself, which increases with the experience of previous work.

Glover et al. (2000), state that auditors only trust the conclusions that result from the use of analytical procedures if the results obtained were expected, since when the evidence

they provide does not corroborate the expectations formulated by the auditors, then the confidence attributed to such procedures is reduced. In this scenario of favourable conclusions, they argue, auditors tend to attribute a lower risk that the item or class of transactions in question actually presents material misstatements, so they do not significantly develop substantive detailed procedures, and may sometimes fall into the error of admit such non-existence when in fact there are material misstatements. This conclusion is in convergent with that of Mahathevan (1997) and that of Blocher et al. (1993), insofar as these authors conclude that analytical procedures are unequivocally more effective in determining areas where there is potentially greater risk of material misstatement (at the planning stage) than to detect errors or fraud.

In addition, the question has been debated, before and after the financial scandals of the beginning of the 21st century (Benston et al., 2002), whether in fact this type of analytical procedures, considered cost-effective, guarantee, or not, the security that stakeholders require from the opinion issued by an independent auditor (Fleming, 1999; Lin et al., 2003). In particular, within the SEC, there has been a debate on the implementation of auditing regulations that direct the performance of auditors towards a more intensive use of substantive detail procedures as evidence, to the detriment of evidence produced by analytical procedures (Lin et al., 2003). This debate stems from the fact that the failure to supervise the aforementioned financial scandals of the 21st century resulted, on the part of independent auditors, from the extensive use of analytical audit procedures as evidence, based on deficient internal control systems, that is, significantly high risks of material misstatement, which strongly discouraged the use of this type of analytical audit procedures as corroborative evidence (Benston et al., 2002).

However, these findings collide with the results of empirical studies carried out by Cohen et al. (1989), Fraser et al. (1997) and Lin et al. (2003), in which auditors categorically state that the use of analytical procedures has no implications in terms of the use of substantive detailed procedures, insofar as they serve to prove collected evidence and not so much to reduce the degree of substantive detail procedures in the audit plans. In particular, Cohen et al. (1989) reinforce that, according to their findings, the use of analytical procedures at this stage complements the use of substantive tests of detail, but in no case did they find that analytical procedures are used to reduce or replace the evidence produced by substantive detail procedures. This conclusion is explained, as mentioned above, by resorting to the eminently conservative and defensive tendency of the auditors.

According to Stringer (1975), the increase in confidence provided by either analytical procedures or tests of detail increases the general confidence in the evidence produced by substantive procedures as a source of evidence. However, warns Stringer (1975), confidence in analytical procedures should only be high if the auditor's judgment on internal controls is frankly positive, otherwise the security provided by analytical procedures tends to be null at this stage of the audit work. This vast investigation about

Vol: 14 **No:** 03 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

the confidence of analytical procedures as audit evidence lacks totally investigation about financial statements in which they may be used more accurately, and what type of analytical procedures, as defined in ISA 520, are in fact used. This study absence is the object of investigation of this article.

4. METHODOLOGY

The objective of this article is to find out in what financial statements / auditing areas analytical procedures are more likely to be used, and what type of procedures are in fact more appropriate. There was found no previous scientific investigation about this issue, which underlines the original significance of this research.

In order to obtain statistical evidence about the above-mentioned objective a survey was prepared and sent by email to partners or ex-partners of Big4 auditing companies in the Iberian Peninsula. It is understood that Big4 auditing companies absorb the greater part of the financial auditing market, and that their partners perception about this issue incorporates a profound and relevant experience in this area. Therefore, the questionnaire was directed only to active audit partners.

According to the 2022 Audit Analytics (Hallas, 2022) report, Big4 firms audit the vast majority – 88% – of large accelerated filers. Outside of the Big Four, there are 36 other firms that compete for the remaining 12% of the large accelerated filer registrant market. As for the non-accelerated filer market the Big4and Marcum account for 57.4% of the non-accelerated filer audit market. There are 57 other firms that share the remaining 42.6%.

As result, 92 valid responses have been obtained and thus subject to this empirical study, on a total of 99 responses received. As for that we verify that 99 responses to the survey were obtained, in which 7 (corresponding to 7.1%) showed that the auditor did not use analytical audit procedures, so only 92 inquiries (corresponding to 92.9%) were considered within the scope of the study to be carried out. The sample size is adequate to the universe in study in the Iberian Peninsula, having in mind a total of around 1.100 audit partners operating in Big4 audit firms in this region. As to calculate the minimum sample size for 95% confidence level for such study,

$$n = \frac{p\ x\ q}{\frac{D^2}{Z_a^2} + \frac{p\ x\ q}{N}}$$

Being:

- n the sample size;
- Zα/2 the critical value that corresponds to the desired degree of confidence (1,96);

Vol: 14 **No:** 03 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

- p the proportion of the population that verifies the characteristic under study (92,9%);
- q the proportion of the population that does not verify the characteristic under study, i.e. (1-p = 7,1%); and
- D the margin of error or maximum estimation error that identifies the maximum difference between the sample mean (X) and the true population mean (5%).

For the data collected we calculate a relevant sample of 90 answers, thus the sample size obtained is adequate for the purposes of the study carried out.

The questionnaire issued questioned the answering partners according to a Lickert Scale (1-5) in which audit areas analytical procedures were used and for each working area and type of analytical procedures were developed. This methodology is adequate for the article purposes as is intends to evaluate the level of usage of specific audit procedures based of active audit practitioners, and to evaluate the relevance they attribute to such practices. It is often used to measure respondents' attitudes by asking the extent to which respondents agree or disagree with a particular question or statement. According to Reis et al. (1999), the instrument used is adequate to evaluate the opinion or acceptance degree of a certain issue under evaluation.

Over such descriptive analysis, confidence intervals were constructed (at a confidence level of 95%) and parametric mean tests were developed to conclude if statistically there are significant mean differences in the results obtained (ANova testing). SPSS statistical software was used for data analysis.

5. STATISTICAL RESULTS

The statistical results obtained in this study are presented below.

a) Usage of Analytical Procedures in Fixed Assets

Table 1. Usage in Fixed Assets Frequency

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	2	2,2	2,2	2,2
Sometimes	26	28,3	28,3	30,4
Frequently	54	58,7	58,7	89,1
Always	10	10,9	10,9	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

Results show a significant concentration of answers as being “frequently” meaning that this may be a area where analytical procedures are often used as evidence.

b) Usage of Analytical Procedures in Inventories

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

Table 2. Usage in Inventories Frequency

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	2	2,2	2,2	2,2
Rarely	8	8,7	8,7	10,9
Sometimes	6	6,5	6,5	17,4
Frequently	56	60,9	60,9	78,3
Always	20	21,7	21,7	100,0
Total	92	100,0	100,0	

Source: SPSS Software

Results show that a greater part of respondents answered "frequently", meaning that this may be a area where analytical procedures are often used as evidence.

c) Usage of Analytical Procedures in **Sales / Clients**

Table 3. Usage in Sales / Clients Frequency

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Sometimes	2	2,2	2,2	2,2
Frequently	50	54,3	54,3	56,5
Always	40	43,5	43,5	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

In this financial statement area results show a severe concentration of answers in the scale of "always" or "frequently" meaning that analytical procedures are of evident importance in this area.

d) Usage of Analytical Procedures in **Purchases / External Services / Suppliers**

Table 4. Usage in Purchases / External Services / Suppliers Frequency

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Sometimes	2	2,2	2,2	2,2
Frequently	54	58,7	58,7	60,9
Always	36	39,1	39,1	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

In this financial statement area results show a severe concentration of answers in the scale of "always" or "frequently" meaning that analytical procedures are of evident importance in this area.

e) Usage of Analytical Procedures in **Other Creditors / Debtors**

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

Table 5. Other Creditors / Debtors Frequency

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	2	2,2	2,2	2,2
Rarely	30	32,6	32,6	34,8
Sometimes	30	32,6	32,6	67,4
Frequently	28	30,4	30,4	97,8
Always	2	2,2	2,2	100,0
Total	92	100,0	100,0	

Source: SPSS Software

Responses show a wide dispersion of opinions in this area, meaning that usage of such procedures are very questionable to obtain evidence in this area.

f) Usage of Analytical Procedures in **Government Entities**

Table 6. Usage in Government Entities Frequencies

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	6	6,5	6,5	6,5
Rarely	22	23,9	23,9	30,4
Sometimes	30	32,6	32,6	63,0
Frequently	26	28,3	28,3	91,3
Always	8	8,7	8,7	100,0
Total	92	100,0	100,0	

Source: SPSS Software

Results also show a wide dispersion of opinions in this area, meaning that usage of such procedures are very questionable to obtain evidence in this area.

g) Usage of Analytical Procedures in **Provisions**

Table 7. Usage in Provision Frequencies

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	6	6,5	6,5	6,5
Rarely	24	26,1	26,1	32,6
Sometimes	24	26,1	26,1	58,7
Frequently	22	23,9	23,9	82,6
Always	16	17,4	17,4	100,0
Total	92	100,0	100,0	

Source: SPSS Software

It is observable in this area that a significant range of auditor do not consider adequate the usage of analytical procedures in this area.

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

h) Usage of Analytical Procedures in **Accruals**

Table 8. Usage in Accruals Frequencies

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	6	6,5	6,5	6,5
Rarely	8	8,7	8,7	15,2
Sometimes	24	26,1	26,1	41,3
Frequently	34	37,0	37,0	78,3
Always	20	21,7	21,7	100,0
Total	92	100,0	100,0	

Source: SPSS Software

Accruals is an area in which answers also show a significant variety, meaning that such procedures are not consensual in this area-

i) Usage of Analytical Procedures in Cash / Loans

Table 9. Usage in Cash / Loans Frequencies

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	8	8,7	8,7	8,7
Rarely	24	26,1	26,1	34,8
Sometimes	10	10,9	10,9	45,7
Frequently	26	28,3	28,3	73,9
Always	24	26,1	26,1	100,0
Total	92	100,0	100,0	

Source: SPSS Software

The dispersion of answers obtained show that this area is far from being consensual in terms of analytical procedures usage.

j) Usage of Analytical Procedures in Equity

Table 10. Usage in *Equity Frequencies*

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	28	30,4	30,4	30,4
Rarely	20	21,7	21,7	52,2
Sometimes	16	17,4	17,4	69,6
Frequently	16	17,4	17,4	87,0
Always	12	13,0	13,0	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

More than half auditors do not consider relevant analytical procedures in the Equity area.

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

l) Usage of Analytical Procedures in Payroll

Table 11. Usage in Payroll Frequencies

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Sometimes	8	8,7	8,7	8,7
Frequently	38	41,3	41,3	50,0
Always	46	50,0	50,0	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

It is observable almost a consensus (91,3%) in terms of usage of analytical procedures in the area of Payroll / Staff Expenses.

m) Usage of Analytical Procedures in Other Income / Expenses

Table 12. Usage in Other Income / Expenses Frequencies

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	2	2,2	2,2	2,2
Rarely	8	8,7	8,7	10,9
Sometimes	24	26,1	26,1	37,0
Frequently	38	41,3	41,3	78,3
Always	20	21,7	21,7	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

Also, in this area it is observable that 63% of auditors consider inevitable the usage of analytical procedures in order to obtain some evidence in other income / expenses.

n) Usage of Analytical Procedures in Financial Expenses / Income

Table 13. Usage in Financial Expenses / Income

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	2	2,2	2,2	2,2
Rarely	2	2,2	2,2	4,3
Sometimes	12	13,0	13,0	17,4
Frequently	52	56,5	56,5	73,9
Always	24	26,1	26,1	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

Results show a concentration of answers “frequently” and “always” of 83% meaning that analytical procedures are widely used in this area.

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

o) Usage of Analytical Procedures in Extraordinary Results / Discontinued Operations

Table 14. Usage in Extraordinary Results / Discontinued Operations

	Frequency	Percent	Valid Percent	CumulativePercent
Valid Never	12	13,0	13,0	13,0
Rarely	14	15,2	15,2	28,3
Sometimes	24	26,1	26,1	54,3
Frequently	32	34,8	34,8	89,1
Always	10	10,9	10,9	100,0
Total	**92**	**100,0**	**100,0**	

Source: SPSS Software

Due to the specific nature of this area, results show a significant variance and disagreement about usefulness of analytical procedures in this area.

In order to summarize the previous results, using a 95% confidence interval for the means obtained, we may synthetise the results in the following table in order to highlight the areas in which analytical procedures are mostly used:

Table 15. Confidence Intervals for Audit Area

	Mean	Variance	LowerBound	UpperBound
Fixed assets	3,761	0,536	3,609	3,912
Inventories	3,913	0,828	3,725	4,101
Sales / clients	4,413	0,289	4,302	4,524
Purchases / Suppliers	4,367	0,280	4,260	4,479
Other Debtors / Creditors	2,987	0,813	2,792	3,165
Government entities	3,087	1,135	2,866	3,308
Provisions	3,192	1,434	2,948	3,444
Accruals	3,587	1,256	3,355	3,819
Cash / Loans	3,370	1,818	3,090	3,649
Equity	2,609	1,999	2,316	2,902
Payroll	4,413	0,421	4,279	4,547
Other Income / Expenses	3,717	0,952	3,515	3,919
Financial Income / Expenses	4,022	0,681	3,851	4,193
Extraordinary Income / Expenses	3,152	1,449	2,903	3,402

Source: SPSS Software

As a summary of the analysis of this point, four major groups of audit areas can be distinguished, in which the frequency of use of analytical procedures such as evidence collection presents markedly different profiles.

Vol: 14 **No: 0**3 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

Group I (highlighted in the table above): In a first group in which the observed average of the sample is greater than 4, that is, it tends towards the answer "always" including the areas of Sales / Customers, Purchases / Suppliers, Payroll and Income / Financial Expenses. It should be noted that, at this level, the observed variance is also quite low, which gives rise to a certain consensus within the profession.

Group II: In a second group, where the observed average of the sample is lower but close to 4 (often), where we can include the areas of Fixed Assets, Inventories, Accruals and Deferrals and Other Revenues / Expenses. It should be noted, in this context, that in this group the variability of the auditor responses is higher than in the previously defined group.

Group III: In a third group composed of the State, Provisions, Cash and Income / Extraordinary Expenses, Discontinued Operations audit areas, where on average the answers obtained are close to the category "some", although greater than 3. In these areas the variance of the answers obtained is also higher compared to group I.

Group IV: Finally, in a fourth group composed by the areas of Other Debtors and Creditors and Equity, where the answers on average are lower than the central measure, however, this group presents a high consensus on the part of the auditors in view of the reduced variance of the answers obtained, so it can be concluded that in these areas there is a certain professional unanimity in not resorting to analytical audit procedures.

At this stage of the investigation, being defined the profile of the use of analytical procedures by audit area, it is therefore important to assess which type of analytical procedures provide the auditors with greater security. Regarding the areas of work in which analytical procedures are most urgently used, the auditors were asked which type of tests were most used to obtain evidence. The table below describes the results obtained for these four areas of work:

Table 16. What tests are most used

Sales / Clients	Comparison Tests, Tendency Analysis, Financial Ratios, Reasonability Tests	High
Purchases External Services / Suppliers	Comparison Tests, Tendency Analysis, Financial Ratios, Reasonability Tests	High
Payroll	Comparison Tests, Tendency Analysis, Financial Ratios, Reasonability Tests	High
Financial Income / Expenses	Comparison Tests, Financial Ratios, Reasonability Tests	High

Source: Table prepared by authors

It can be clearly seen that in these areas Analytical Procedures categorized as being simpler are used to the detriment of procedures with a greater degree of complexity, such as Statistical Regressions and Scanning Tests.

Vol: 14 **No:** 03 **Year:** 2022 **ISSN**: 1309-8055 (Online) (**pp.** 302-321) **Doi:** 10.34109/ijefs. 20220075

Table 17. Complexity of Analytical Procedures

Less complexity tests	Comparison tests Tendency tests Ratio analysis Reasonability tests
Higher complexity tests	Scanning tests Regression tests

Source: Table prepared by authors

6. CONCLUSIONS

According to the data obtained, we may conclude, in this context, that auditors tend to resort more frequently to analytical procedures in areas where (i) there is a greater volume of transactions and documents, (ii) there are usually management and accounting computer support tools capable of providing data for the application of analytical procedures by auditors; and (iii) recorded transactions tend to be more routine. In view of this finding, it may be confirmed that one of the objectives inherent to the use of analytical procedures is to reduce the extent of the use of substantive detail procedures (Boynton et al., 2005; Fraser et al., 1997). From this perspective, the areas where it was found that auditors most use analytical audit procedures that therefore fulfil the above requirements were the areas of (i) Sales / Customers, (ii) Purchases / Suppliers, (iii) Personnel Expenses and (iv) Income / Financial Expenses.

On the other hand, the results indicate that in the areas identified above, procedures considered to be less complex are used, such as comparison tests, tendency analysis, financial ratios, reasonability tests. This finding may indicate that less complex tests are in fact more efficient and effective as an auditing technique designed to provide corroborating evidence of the assertions contained in the headings, classes of transactions, financial statements and respective disclosures. These results converge with the work of Ameen et al. (1994), Fraser et al. (1997) and Mulligan et al. (1999) who also state in this context that auditors tend to use less complex analytical procedures. The conclusions also suggest that the complexity of the scanning tests and regression analysis do not allow their use by the auditors, either because of their lack of technical knowledge or because of difficulties in adapting and formatting the information provided by the audited entities to the use of these complex techniques.

Having the above in mind we may define the four areas of financial statements / auditing in which analytical procedures are more reliable and, conclude clearly that auditors tend to use simpler procedures rather than statistically more complex ones. It becomes clear with the conclusions thar arise from this study that analytical procedures are in fact relevant in the four areas identified, and therefore, practitioners may rely on conclusions made upon analytical testing for audit evidence gathering.

Further investigation to be taken in this area could explore weather data analysis and more sophisticated audit software have a positive or negative impact on the usage of analytical procedures. Also, having in mind that analytical procedures tend to be more efficient, that is, to consume less resources, it could be explored if increasing usage of such procedures have a significant impact on financial auditing fees.

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