

AUDITING ACCOUNTING ESTIMATES AND FAIR VALUE MEASUREMENTS. A LITERATURE REVIEW

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Abstract: *The audit of accounting estimates, fair value measurements, and the associated risks, is a challenging subject, as already pointed out by regulatory bodies and researchers. However, the timeliness and the "never ending debate" of this topic are proved also by the directions for future research mentioned by the authors in the discussion sections from their papers. For this reason (the relevance of the subject) the goal of this paper is to realize a qualitative and quantitative analysis related to the audit of accounting estimates. We will see that the authors debate important issues related to audit risks, and present important findings, but it turns out that research work is never enough, a kind of Pandora's box opens. The paper provides an image about the current stage of the research, the results obtained so far, and new directions of research related to our topic, the main audit risks identified so far, related to the estimates. Our interest is focused on the proposals of the academics to handle these risks and the extent to which regulators managed to implement solutions to reduce these risks*

Keywords: *estimates, fair value, risks*

JEL codes: M41, M42

Introduction

Now, more than ever, the accounting estimates are an important part of the financial statements, with a significant impact on companies' financial results and they remain a pressing issue, as evidenced by the interest of regulatory bodies in improving these standards.

In this paper, we conducted a review of the academic literature associated with the audit of accounting estimates and Fair Value Measurements (Fv measurements). This approach is required firstly because it allows a better understanding of the field and the conceptual characteristics of this theme. Secondly, it provides an image about the current stage of the research, the results obtained so far, and new directions of research related to our topic. Particularly, we intended to observe the main audit risks related to the estimates identified so far. Furthermore, we are interested in the proposals of the academics to handle these risks and the extent to which regulators managed to implement solutions to reduce these risks. This helps us further to see which is the stage of understanding and perception of these risks because the question that remains is what else can we as researchers do to provide some solutions and directions.

The debate around accounting estimates starts from the fact that the measurement of estimates could be more complex than other items when preparing financial statements. Given the limitation in knowledge or data, the methods or models applied, and the assumptions made to obtain the estimates, they are certainly subject to estimation uncertainty. As outlined within ISA 540 *Auditing Accounting*

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DOI: 10.29302/oconomica.2024.26.1.3

Estimates and Related Disclosures, the *estimation uncertainty* is "the susceptibility to an inherent lack of precision in measurement" (IAASB, 2018). Therefore, the human nature influenced by all the circumstances cited above can release estimates that are likely to be materially misstated. For this reason, we can discuss about *management bias* as defined within ISA 540: "A lack of neutrality by management in the preparation and fair presentation of information" (IAASB, 2018). The same standard states that the main objective for the auditors is "to obtain sufficient, appropriate evidence on whether accounting estimates, including fair value accounting estimates, are reasonable, and related disclosures in the financial statements are adequate" (IAASB, 2018).

We specify FV measurement separately, as it is considered one of the most challenging accounting estimates for auditors, especially when they must face Level 2 or Level 3 of FV measurement. If quoted market prices from an active market are used to measure FV, we can not necessarily discuss about a high degree of estimation, consequently, the auditors' work does not present too many risks. Though, if the market prices are not available, the financial statement preparers have to find similar values for similar assets or liabilities, or they have to use valuation methods, which involves most often a high degree of judgment and uncertainty. For this reason, authors interested in this subject refer in their research either to fair value (FV) as a form of accounting estimation, or to other categories of estimates, in order to provide empirical evidence. Thus, in our review, we will consider all the studies that bring to our attention the audit risks related to FV measurement or any other estimates.

Research methodology

This paper is a bibliometric study, on the literature that addresses the topic of risks related to auditing FV measurement and other estimates. In order to identify current trends for this theme and considering the quality of research papers published so far, we selected articles from three important databases, namely Web of Science (WOS), Springer Link, and Scopus. This part of our research was possible through the ANELIS Plus platform, which allows electronic access to scientific and research literature.

Taking into account the search rules of each database, for Springer Link we chose first the following search structure: "*audit risk*" AND ("*fair value*" OR "*accounting estimates*"). This search arrangement allowed us to restrict our searches to articles that address only the audit of accounting estimates or fair value and specific risks. The result obtained consisted of 36 articles, in English, seemingly relevant to us. Since the addition of the word risk seemed to restrict our results, we changed the structure. The new search formula was as follows: "*audit*" AND "*accounting estimates*" OR "*fair value*" in the Accounting/Audit field. Thus, we obtained 442 articles, which included also the 36 items mentioned above.

In Web of Science Core Collection the search structure was as follows: "*audit*" AND "*accounting estimates*" OR "*audit*" AND "*fair value*". Following this search query, we obtained 189 articles in English. After we removed the articles from other fields that did not interest us, we obtained a total of 181 research papers.

According to the advanced search option offered by Scopus, we used the following structure: "*audit*" AND "*accounting estimates*" OR "*audit*" AND "*fair value*". This query search returned 143 documents in English with the audit of accounting estimates or the audit of FV measurements as a main topic of research. The next step was to keep only the researches in the fields of „Business, Management and Accounting“, „Economics, Econometrics and Finance“, „Social Sciences“ or „Decision Sciences“; as they appear in Scopus database. We have 122 articles left to be subject to a more detailed analysis. We made the same steps as for the other database, to eliminate articles from areas that were not of interest to us, such as Engineering, Medicine, Computer Science, Energy, Environmental Science, and Materials Science.

Quantitative analysis of the articles in the field of audit of accounting estimates and FV

After following the steps described above, considering all the possibilities of research for our topic of interest we matched the results to see exactly how many different articles we have. In Table no.1 we present the number of articles resulting from each database.

Table no. 1 The number of items resulting from the selected databases

DATABASE	Number of total articles	Irrelevant articles phase 1	Duplicated articles/Irrelevant articles phase 2	Relevant articles
Web of Science	181	126	5	50
Springer Link	442	433	5	4
Scopus	122	74	42	6
TOTAL	745	633	52	60

The first column of Table no.1, respectively the number of total articles, represents the number of articles obtained after querying the databases by the search expressions mentioned above. Out of a total of 745 scientific papers, 59% are those from Springer Link, followed by WOS with 24% and 17% Scopus.

The second column is equivalent to the first disposal phase according to our reasoning for excluding items from the sample. Thus, after a brief review of the title, abstract, and keywords (and in some cases the article itself) we eliminated those items that did not address the issue of auditing fair value, accounting estimates, and the associated risks. As can be seen, we removed a very large percentage of Springer Link's articles; those oriented more on topics such as the effects of FV for the banking sector, corporate governance, earnings, and issues on corporate governance, FV and audit fees etc. We proceeded similarly with the other databases, eliminating everything that did not refer to the audit risks regarding accounting estimates and fair value.

The third column reflects the research papers eliminated because they are indexed in multiple databases and repeated in our sample, or those articles, that after a detailed review, proved to be irrelevant, without a clear contribution on our topic of interest. According to our judgment, if an article was published in Springer Link or Scopus and WOS, we kept it in WOS. Our reasoning is related to the notoriety of this platform and the search mechanism that allows more options. The majority of duplicates were in the Scopus database, thus we eliminated 80,77% from the total of 52.

Finally, the last column contains the remaining relevant articles, based on which we will continue our research. As illustrated in Figure no. 1, most of the scientific articles we will discuss come from the WOS database, being 83,33% from the total of 60. From Scopus, we obtained 10% from the 60 papers, therefore, those articles additional to those found in WOS.

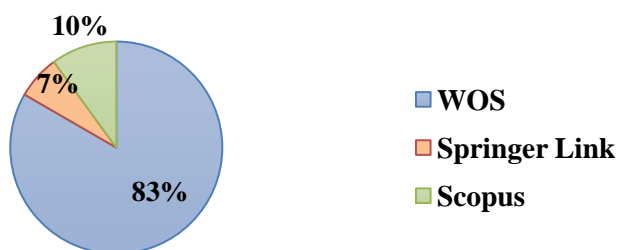


Figure no. 1 The sample of articles in the databases

Figure no. 2 shows that the articles in our sample, relevant on the subject "risks associated to the audit of accounting estimates and FV measurements", date from 2006. However, fair value and accounting estimates were topics addressed prior to this year, but not so much in the context of the risks to which they expose auditors. If it is to correlate with the international context, in September 2006 IAASB approved a revision of the initial ISA 540 (initially issued in September 1993) and then, in 2007, they decided to incorporate fair value accounting estimates in the new ISA 540, effective application beginning in December 2009 (IAASB, 2016).

The graph shows that starting with 2012, the number of publications on this subject begins to increase. At the same time, IAASB was concerned about a constant improvement of the standard in the context of a more complex business environment, addressing evolving audit risks relating to accounting estimates. This concern can also be seen among scientific researchers, who started to address this issue in their work. Therefore, in parallel with the IAASB work, the number of scientific articles on the risk assessment and other issues related to accounting estimates raises. In our sample of the selected articles on this subject, the maximum is reached in 2019, with 13 published articles. We note that the latest update of ISA 540 was effective for audits of financial statements for periods beginning on or after December 15, 2019.

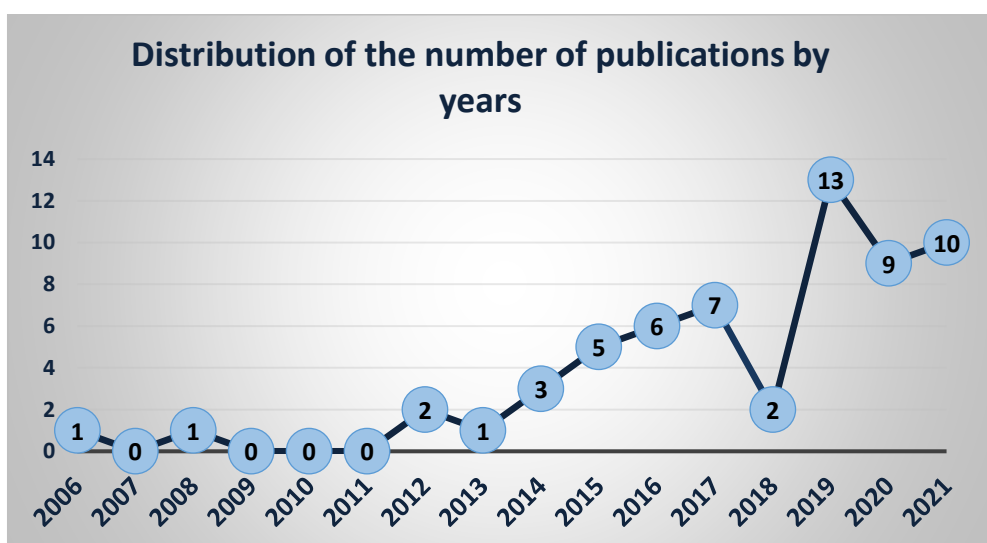


Figure no. 2 Number of publications by year

Another important aspect is related to the distribution of the paper by journal. Using SPSS we generated a frequencies table so as to obtain the number of articles published by each journal, as it is shown in the chart below. In Figure no. 3 we present the distribution of the sample of 21 journals containing the 60 main publications we examine. The highest percentage is assigned to Accounting Review journal, with 17%, followed by Accounting, Organizations and Society and Auditing: A Journal of Practice & Theory with 13% of the analysed research papers. The third place is occupied by Contemporary Accounting Research with a close percentage of 12%.

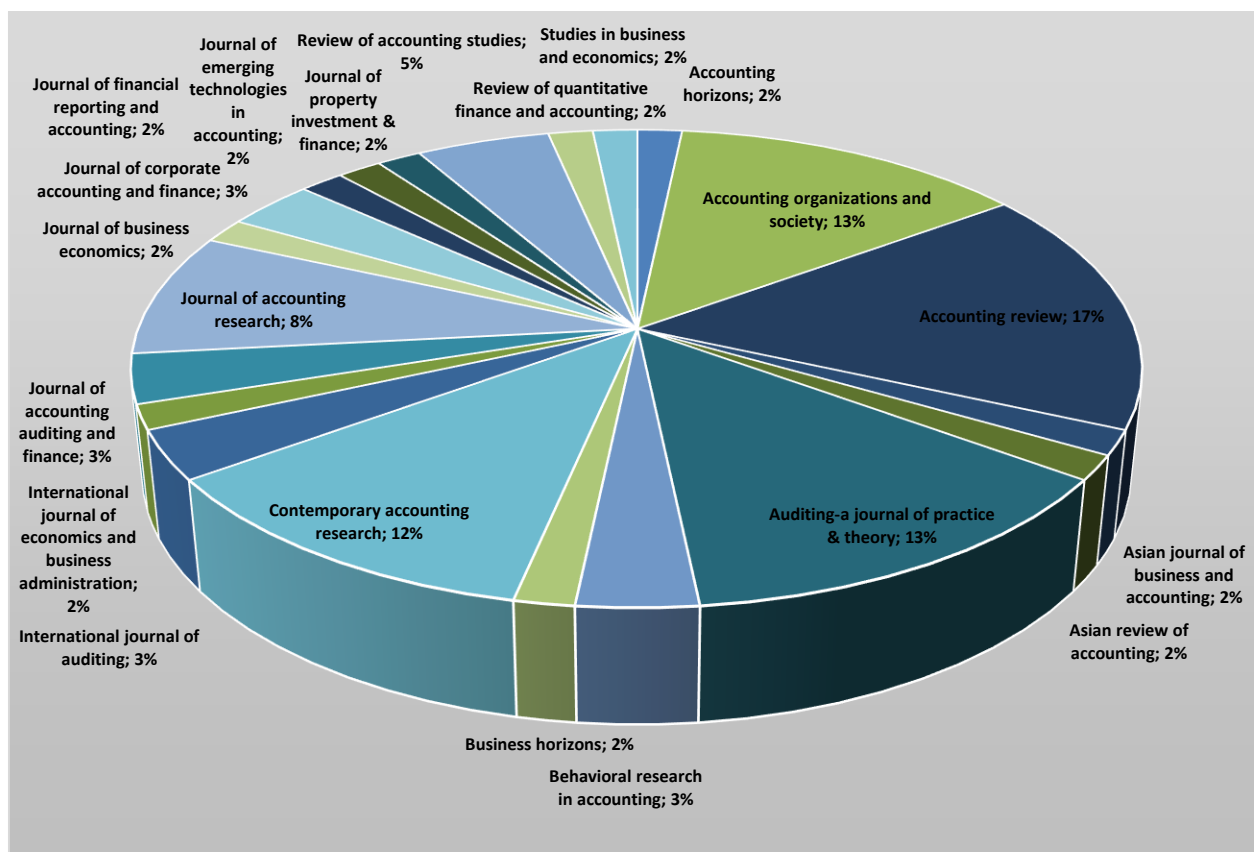


Figure no. 3 Distribution of articles in scientific journals

Therefore, we can conclude that our sample of 60 articles comply also with the requirements related to the relevance of an article or the relevance of a journal, according to an H index analysis. The statistics performed via SPSS revealed that from maximum of 13 publications in 2019, 30% of them are published by Accounting Review, the first place in the top related to the journals' relevance.

The above findings regarding the quantitative analysis of the literature on our subject provide us an image about the relevance level of the publications. Moreover, we consider that it is not enough to familiarize ourselves with the subject, to identify the gaps in the literature or to gain insight and understanding of the selected topic. We want to be able to better identify the added value that we could bring with our research, taking into account the resources that we have at our disposal. That is why we consider important this quantitative analysis, whose conclusions help us to better design and justify our research.

Qualitative analysis of the articles in the field of audit of accounting estimates and fair value

In this section, we have selected only a few articles relevant to our topic, which provide insight and guidance on the risks of auditing accounting estimates. In an attempt to establish directions for reviewing the literature, we synthesized the issues related to the audit of estimates in terms of risks or challenges, consequences and the process as a whole. In this approach we relied on the conceptual framework previously used by Bonner (2008) and Bratten et al. (2013) that examines the factors affecting the auditor judgments, such as the environment, the task, and the person factors. Bonner (2008) defines environmental factors as those connected to the conditions and circumstances inherent to the environment, task factors as those affecting the nature of the auditor's task, and person factors as those related to the individual's characteristics.

The main issue - **the estimation uncertainty(1)** - is the starting point. According to Bratten et al. (2013), the inherent estimation uncertainty is the most important environmental factor affecting

the audit of fair value and accounting estimates. The theory of decision-making under uncertainty (Lipshitz & Strauss, 1997) states that there are three types of uncertainty: inadequate understanding, incomplete information, and undifferentiated alternatives. So, if we consider the audit of estimates, the uncertainty is manifested in all three ways of conceptualization identified by Lipshitz & Strauss (1997).

Thereby, the lack of information means the non-availability of observable inputs or unreliable inputs, required to prepare accounting information (verified by the auditors). This aspect correlates with the market uncertainty. The inadequate understanding can be associated both with the auditor-specific factors, as defined by Bratten et al. (2013), and with the ambiguous, novel, or instable information. The third type of uncertainty can result from undifferentiated outcomes or the conflict among alternatives, which is manifested first among managers (the estimates preparers) and then among auditors.

Hence, this estimation uncertainty is a real burden for the auditors, but in parallel, it creates incentives for the abusive use of subjectivism. We refer here to **management bias(2)** and distorted estimates. There is an obvious double burden on auditors, once, the inherent uncertainty and then the intentional distortion using this uncertainty.

The three conceptualizations of uncertainty impact the **audit task(3)** as well, so auditors need to find solutions to combat it. As we will see below, some of them have been intensely discussed in previous research (Christensen et al. 2012; Bell & Griffin, 2012; Bratten et al. 2013; Glover et al 2017; Cannon & Bedard 2017; Eilifsen et al. 2021). The extra work for the auditors is not the exclusive remedy to cope with uncertainty; sometimes extra skills for complex model understanding or more professional judgments, professional skepticism or even the use of specialists, are needed. Therefore, we further present a summary of the solutions identified and intensely discussed by the researchers.

Certainly, the uncertainty and the management bias do not only have an impact on the audit task itself, but also on the results of the mission. We talk about **audit quality consequences(4)**, such as: the reliability of audit evidence (audit quality decrease), litigation and reputation risks, adjustments/ restatements requested that finally impact the financial statements quality and the investors' confidence.

One of the research directions in which the scholars have engaged was to identify and debate the challenges perceived by auditors when auditing accounting estimates. In their study, Oyewo et al. (2020) observed through their questionnaire administrated on 277 auditors the main challenges of auditing fair value and accounting estimates. Accordingly, the top three positions are earnings manipulation (management bias), the difficulty to test inputs resulting from judgments and assumptions (information relevance for FV), and estimation uncertainty. It is worth noting that these risks currently perceived by auditors in Oyewo et al. (2020) study are the same as those mentioned a few years ago by Christensen et al. (2012), Bratten et al. (2013), Griffin, (2014) or Glover et al. (2017). Another finding of this study is that there is no significant difference in the auditors' perception of the audit challenges associated with FV measurement and accounting estimates. On the contrary, the authors concluded that there is a difference in perception of these audit challenges for FV measurement and accounting estimates across the industry sector.

Oyewo et al. (2020) conclude, as previous authors (Bratten et al. 2013; Griffin, 2014; Glover et al. 2017) that audit and accounting regulators and also researchers should continue to investigate this topic for pertinent answers to these challenges. We would also like to add that, despite the constant efforts of the standards setters to improve the audit and accounting standards and to add supplementary guidance (FASB, 2018; IAASB, 2018; IASB, 2021), auditors still perceive the same problems and challenges regarding the audit of estimates. In our view, it can be an alerting signal, but also the reason why we dedicate this research to this incompletely explored topic, hoping to have a small contribution in the field.

The complexity of FV measurements and accounting estimates is evidenced by the numerous audit deficiencies reported by international regulators over several years (PCAOB, 2017; PCAOB, 2019; IFIAR, 2017; IFIAR, 2021). Inspectors found recurring deficiencies in areas involving accounting estimates such as allowance for loan losses (ALL), the fair value of financial instruments, or the valuation of assets and liabilities acquired in business combinations (PCAOB, 2019). According to IFIAR, the inspection findings for public interest entities audits revealed that accounting estimates and FV measurement cause the majority of deficiencies (IFIAR, 2021).

It is worth mentioning the study of Glover et al. (2019), in the context of deficiencies inspection results, related to the audit of FV and other estimates. The authors assert that the recurring deficiencies in FV measurement audits are not due only because of deficient auditor performance. Their survey revealed that in a context of complex FV measurement with high estimation uncertainty (Level 2 or Level 3) the auditors perceive differences of opinion compared to inspectors (FV measurement gap). Furthermore, the audit experts claimed that they have been confronted with situations where inspectors expected more evidence and audit tests than is required by the standards. To be more specific, the areas where differences of opinion were perceived between auditors and inspectors are the evaluation of risks, the sufficiency of the evidence, and the appropriate level of reliance on third-party experts (Glover et al., 2019).

We should note also the additional factors which were considered by the authors as maintaining the gap between the experts' opinions: „the high subjectivity and uncertainty inherent to complex FV measurement, the lack of inspector knowledge, expertise, and/or requisite training and judgment bias, the affiliations and incentives between the two types of experts, the lack of clear guidance regarding what constitutes sufficient appropriate audit evidence” (Glover et al., 2019). In our opinion, this is a notable subject, since this FV measurement gap pointed out by the authors can lead to a decrease in FV audit quality. Moreover, increasing the quality of the audit is exactly what is expected after these inspections, and not only adding additional pressure on auditors. This issue is consistent with Stuber & Hogan (2021) findings, that PCAOB inspections lead to less accurate estimates (for allowance for loan losses estimates), instead of more accurate and unbiased estimates as expected after these inspections.

As already stated, the estimation uncertainty is still a matter of great importance, as emphasized in previous studies (Christensen et al., 2012; Bell & Griffin, 2012; Bratten et al., 2013; Glover et al., 2017; Cannon & Bedard, 2017) or by the audit standards ISA 540 Auditing Accounting Estimates And Related Disclosures, respectively AS 2501 Auditing Accounting Estimates, Including Fair Value Measurements.

A recent research on the topic of estimation uncertainty is that of Eilifsen et al. (2021) that emphasizes the importance of understanding the level of uncertainty of estimates for investors. They make this analysis in the context in which even standard setters have made efforts in the last years (FASB 2018, IAASB, 2018) to improve the accounting and auditing standards in order to have a higher level of disclosure for the complex aspects of the financial reporting. Thus, the importance of estimation uncertainty is investigated by the authors through an experiment, from the investors' perspective. The experiment aimed to appreciate the investors' perception of the accounting estimates' reliability (level 3 of FV measurement) and their willingness to invest in a context of high disclosure level. The awareness and understanding of the estimation uncertainty are evaluated when a quantitative sensitivity analysis (QSA) is presented in the financial statement and/or the auditor's materiality threshold is disclosed. The study concluded that the uncertainty of estimates represents a threat to the investors' perception of the estimations' reliability and for a potential desire to invest. They are more willing to invest when both QSA and the materiality threshold are disclosed, and the reliability of the fair value estimated was judged as being significantly higher.

As we can see, from the investors' perspective, literature tries to identify directions for coping with the uncertainty. This is the case also for the auditors, as they are the first to deal with extreme estimation uncertainty. In this regard, it is noteworthy the study of Christensen et al. (2012), which

identifies for two public companies the effects of extreme estimation uncertainty. In our view, the authors demonstrate a key aspect related to the estimates, likely to be a burden for the auditors and consequently for the investors and all other users of accounting information. Thus, the study illustrates that a minor change in the interest rate (unobservable inputs), subject to estimation uncertainty, can alter the value of the estimate (affecting also the net income) and exceeds the materiality threshold. The results are consistent with Cannon & Bedard (2017) that found high levels of estimation uncertainty perceived by the auditors, greater than materiality. Bell & Griffin (2012) express the same concern in their paper.

On the other hand, the findings of Cannon & Bedard (2017) on risk assessment and estimation uncertainty caught our attention. They note that both level 3 assets and the uncertainty level are associated with a higher inherent risk, which in our opinion is to be expected. However, the concern of the authors was related to the fact that even if when estimation uncertainty exceeds materiality, over 30% of the auditors still rate inherent risk as low to moderate. We consider these concerns either the result of a lack of professional skepticism in the audit mission (Griffith et al., 2015b), or as Landuyt (2021) found, an imbalanced emphasis on management bias, which steals auditors' attention from uncertainty and accuracy of estimates.

Also related to the uncertainty of estimates, we must mention the results of two core studies that investigate the auditors' adjustments decision. Griffin (2014) asserts that when the subjectivity of inputs and the imprecision of outcomes are present, the auditors are more likely to require their clients to adjust fair value estimates. He points out the two dimensions of uncertainty, namely imprecision and subjectivity. In parallel, the author remark that the adjustment likelihood decrease in connection with additional disclosure for the fair value estimates. Even if, over the years, numerous authors required supplementary disclosure related to accounting estimates (Christensen et al., 2012; Bratten et al., 2013; Abernathy et al., 2015) and the international regulators made constant efforts to increase the disclosure requirements (IASB, 2021), Griffin (2014) finds also an undesirable consequence of the additional disclosure. He suggests that auditors tolerate greater potential misstatement in the financial statements when clients provide enough disclosure. As mentioned by the authors, these findings can be supported with non-accounting literature (Bazerman & Tenbrunsel, 2011; Loewenstein et al., 2011) that advocates that an appropriate disclosure would make the clients free to allow more bias, as long as they reported about a possible misstatement, so they did their duty.

We believe that these conclusions and the results of Griffin (2014) study should be considered by regulators, especially in the context of new amendments that are being prepared to improve the disclosure requirements of IFRS 13 (IASB, 2021). We do not deny the positive effects of proper disclosure; we just want to draw attention, as others have done so far, to possible „side effects” of supplementary disclosure, as perceived by the FV providers.

Besides the authors cited above, there are other previous studies claiming that more evidence is not always better for the auditors. If we were wondering, how this could happen and in what context, we cite Rowe (2019), which draw similar conclusions. He finds that if the estimates' uncertainty is moderate, the auditors are more comfortable with less evidence, asking for more evidential support only for extreme estimation uncertainty. The author argues that auditors find it more difficult to defend their judgment related to the estimates when they have too much evidence from managers.

Thus, on one hand, additional disclosure or more evidential support decreases the likelihood of asking for adjustments, but at the same time, auditors are more likely to tolerate greater potential misstatement in the financial statements or they consider that more evidence prevents them from defending their own judgments about estimates.

In the same vein, Cannon & Bedard (2017) find that auditors are prone to discuss potential adjustments when estimation uncertainty is still perceived at the end of the audit mission, but few of the discussed adjustments are ultimately booked. If these adjustments or financial restatements asked by the auditors can reduce the management bias or the misstatement likelihood in the following period, is a topic to be addressed in a future research work.

Conclusions

In one way or another, this section was intended to give us a general perspective on the challenges or risks specific to accounting estimates. In the same time, the findings of these research signal the issues related to the audit of accounting estimates and justify our choice for the 4 themes to be discussed. Therefore, we summarized how the **uncertainty(1)** and the **management bias(2)** as the main audit risks with consequences on the **auditors' work(3)** and the **audit quality(4)**, were addressed by the academics in their research.

In order to conclude we would like to mention that we are aware that there are still some un-discussed sub-topics that could be addressed in futures researches in a more comprehensive way. We consider that through this literature review presented so far we provide an overview of the current perception of the audit of accounting estimates. One thing we noticed was the close connection between the four themes specific to accounting estimates and the audit process. Therefore, the **uncertainty** is a problem *per se*, inherent to estimates and in parallel creates premises for distortion, for **management bias**. Obviously, this has an impact on the audit mission from two points of view: the **audit task** (skills and judgments, extra work, external specialist etc.) and the **audit quality** (adjustment/restatements requirements, financial reporting quality, litigation risks etc.).

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