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Accounting estimates - Risks and challenges in the audit mission

Ioana Ciurdaș

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Ioana Ciurdaș. Accounting estimates - Risks and challenges in the audit mission. Business administration. Université Côte d'Azur; Universitatea Babeș-Bolyai (Cluj-Napoca, Roumanie), 2022. English. NNT : 2022COAZ0046 . tel-04860567

HAL Id: tel-04860567

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THÈSE DE DOCTORAT

Estimations comptables- Risques et enjeux pour la mission d'audit

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Laboratoire Groupe de Recherche en Management(GRM)

**Présentée en vue de l'obtention
du grade de docteur en Sciences de Gestion
d'Université Côte d'Azur
et d'Université Babeş-Bolyai
Dirigée par : Elisabeth Walliser/Adela Deaconu
Soutenue le : 14.12.2022**

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Estimations comptables - risques et enjeux pour la mission d'audit

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Acknowledgements

"Intâi datoria, apoi bucuria!"
"First comes obligation and later comes satisfaction!"
"C'est d'abord le devoir et ensuite c'est la joie"
- Pr. Teofil Părăian

I started this "journey" without even being fully aware that a journey in the true sense of the word would follow. I started this research work with a lot of enthusiasm, so I am finishing it. The ups and downs that awaited me proved to be a complex mission both professionally (technically), as well as personally. At the beginning, I had not imagined that a PhD thesis could contribute so much to my personal and human development, not only to the professional one. A thought I once read has stayed with me and guided me through these years: "first comes obligation and later comes satisfaction!" It meant a lot for me to be aware that you have joy when you accomplish your duty.

For this journey that I have greatly enjoyed, my deepest gratitude and my heartfelt appreciation go to Professor Deaconu Adela and Professor Walliser Elisabeth. Thank you for supervising my research adventure and especially for the confidence, patience and freedom you gave to me. Your dedication and the warm way you always managed to encourage me remain important lessons for me both professionally and personally. Please allow me to consider you more than research mentors. I am extremely grateful and thankful to Emeritus Professor Alain Burlaud, to Professor Corinne Bessieux Ollier and Professor Carmen Bonaci, for accepting to be members of my jury. I am truly honoured and privileged to share with you my research efforts embodied in this thesis.

I am also grateful to the two institutions under whose aegis I carried out this research, namely FSEGA-UBB Cluj-Napoca and IAE-UCA Nice. They offered me the appropriate environment to carry out my research and documentation activity. I would like to give my sincerest appreciation and thanks to the Ph.D. thesis advisory committee from both universities. I am very grateful for the helpful comments, constructive recommendations and the encouragement you have always greeted me with. I would also like to express my gratitude to my colleagues Alexandra Purcel-FSEGA and Philippe Luu- IAE, the statisticians who had patience with me every time I needed to clarify the great mysteries of statistics and econometrics. Besides knowledge, they gave me confidence and encouragement when I thought I couldn't handle the statistical and econometric side. Special thanks go also to a very close friend, Cosmina Haidu which gave me a lot of clarification on the statistics at the beginning of my PhD journey.

I gratefully acknowledge the support I received from *Conseil Supérieur de l'Ordre des Experts-Comptables (CSOEC)* and *l'Association Francophone de Comptabilité (AFC)*, through the PARC Bourse and the valuable feedback they offered me each year.

I am also grateful to my professors, colleagues and friends from the Accounting and Audit department- FSEGA and GRM Research unit- IAE. I thank Professor Cristian Litan for making me realize the beauty and logic of econometrics through his classes and enthusiasm. I would like to thank also to my colleague from IAE-Nice, Pauline Boisselier for making my stay pleasant and helping me to integrate myself easily into the research lab at IAE, always being there for me to help with the administrative issues.

Last but not least, I have a heartfelt gratitude for the support and love of my sister and parents. I cherish them very much for all they have done for me, especially in these last few years when my focus has been sometimes more on my research...and I thank God for having such wonderful thesis coordinators, professors, university and work colleagues, friends and other remarkable people during my research journey.

Estimations comptables - risques et enjeux pour la mission d'audit

Résumé

Cette thèse aborde un sujet à la fois actuel et complexe pour la comptabilité et l'audit, celui des risques d'audit liés aux estimations comptables et à la juste valeur. Les estimations comptables, en effet, sont en elles-mêmes délicates mais, dans le même temps, inévitables lors de la préparation des états financiers. Les estimations donnent à entrevoir une valeur future et sont, de ce fait, soumises à un degré élevé d'incertitude et donc à un risque inhérent de mauvaise représentation de l'image fidèle de l'entreprise. Il n'existe pas de méthode aujourd'hui, permettant d'aboutir à une juste estimation ne souffrant d'aucune contestation. En effet, l'incertitude, la complexité inhérente aux estimations, l'insuffisance de certaines données nécessaires à leur calcul expliquent que ces estimations soient systématiquement biaisées. En conséquence, les estimations comptables constituent un enjeu de taille pour les auditeurs, ce qui nous a amené à nous pencher sur le sujet. Nous analysons les risques d'audit et les facteurs qui influencent (améliorent ou non) le processus d'audit des estimations comptables.

Notre thèse aborde ces questions par le biais d'une analyse de la littérature et de trois recherches empiriques qui couvrent des aspects clés connexes. Avant de dresser une revue de la littérature, nous avons considéré qu'il était important de présenter aux lecteurs le contexte général de la recherche autour des thèmes principaux de ce travail, celui des estimations comptables et de la juste valeur. Ainsi, notre **premier chapitre** offre une vue d'ensemble sur les normes comptables et d'audit relatives aux estimations comptables et à la juste valeur. Nous précisons les définitions clés ainsi que le processus d'élaboration d'une estimation. Nous identifions ensuite les facteurs ayant un impact sur l'audit des estimations comptables ainsi que les principales raisons pour lesquelles elles sont contestées. Enfin, nous analysons le lien avec la notion de juste valeur, considérée comme l'une des estimations comptables les plus controversées à l'heure actuelle. Le **deuxième chapitre** correspond à la revue de la littérature sur ce sujet. Nous avons rassemblé les articles les plus pertinents sur les facteurs de risque d'audit liés aux estimations comptables. D'après l'analyse des articles sélectionnés, il s'avère que les thèmes relatifs à l'incertitude des estimations, le parti pris de la direction (*management bias*), le scepticisme professionnel ou encore la nécessité de recourir à un spécialiste de l'évaluation, sont les plus débattus. Les résultats révèlent qu'un nombre important d'études mettent l'accent sur la nécessité de développer des indicateurs pour mieux cerner le parti pris de la direction (*management bias*). La littérature indique également que le fait de publier des données supplémentaires sur les estimations

comptables et sur la juste valeur, ou que l'entreprise apporte des éléments de preuves supplémentaires, réduit la probabilité que les auditeurs demandent des ajustements. Les auteurs des recherches précédentes soulignent également la nécessité d'une approche critique, dont il a été prouvé qu'elle améliore l'audit des estimations comptables. De même, les études antérieures révèlent que dans un contexte d'incertitude des estimations, les auditeurs ont tendance à s'entourer de spécialistes. Cette confiance excessive des auditeurs envers des experts externes est précisément critiquée par les organismes de réglementation et de surveillance. Nous identifions dans le **troisième chapitre**, certaines des revendications des organismes de réglementation à travers l'analyse des amendements aux normes d'audit relatifs aux estimations comptables. Nous avons pour cela étudié la convergence des deux normes d'audit internationales les plus importantes sur le sujet, publiées par l'*International Auditing and Standards Board* (IAASB) et le *Public Company Accounting Oversight Board* (PCAOB), à savoir *International Standards on Auditing* (ISA) 540 (*Audit des estimations comptables et des informations y afférentes*) et *Auditing Standards* (AS) 2501 (*Audit des Estimations comptables y compris les évaluations de la juste valeur*). Le **quatrième chapitre** met en évidence les facteurs influençant l'audit de la juste valeur, en analysant, pour le contexte d'un pays émergent -la Roumanie- l'un de ces facteurs en particulier, à savoir le processus d'évaluation mené pour estimer la juste valeur, et en particulier le « fournisseur » de l'estimation de la juste valeur. L'expérimentation que nous avons appliquée comporte deux scénarios de contrôle interne (faible et fort). Elle fournit des informations sur la perception des auditeurs roumains concernant le risque perçu et l'effort qu'ils doivent entreprendre par rapport à la source d'estimation de la juste valeur. Sur la base des résultats obtenus, nous examinons également la motivation et le lien avec les facteurs environnementaux ainsi que les facteurs liés à la mission d'audit susceptible d'influencer l'estimation de la juste valeur (tels que la complexité, l'incertitude, le parti pris de la direction (*management bias*)) et les instructions fournies par les normes. Le **cinquième et dernier chapitre**, est une étude exploratoire et peut être considérée comme une tentative de trouver des indicateurs relatifs aux partis pris de la direction -*management bias* – sur les estimations. Nous mettons en évidence l'impact des retraitements financiers demandés par les auditeurs pour corriger les irrégularités significatives liées à la juste valeur et aux estimations comptables dans les états financiers précédents. Nous considérons ces retraitements comme un signal d'alarme pour les auditeurs en termes de risque de distorsion, étant donné qu'ils sont la conséquence d'estimations biaisées par la direction. Par conséquent, nous étudions le lien entre les estimations comptables (et les risques d'audit liés), les retraitements financiers et l'opportunisme de la direction approximée par la gestion des résultats, pour un échantillon de 64 sociétés européennes, cotées sur le marché financier américain. Les résultats de ce travail permettent de se rendre compte si les retraitements

diminuent le comportement opportuniste de la direction, dans le but d'aider les auditeurs à atténuer le risque d'audit lié aux estimations comptables.

Mots clés : estimations comptables, juste valeur, risques d'audit, retraitements financiers, gestion du résultat, ISA 540, AS 2501, standards d'audit, évaluations à la juste valeur, régularisations discrétionnaires

Title Accounting estimates - risks and challenges in the audit mission

Abstract

This thesis tackles a pressing and challenging topic in accounting and audit, namely the audit risks related to accounting estimates and fair value measurements. Accounting estimates represent a complex area, and an inevitable part of preparing financial statements. Estimates can be seen as an attempt to glimpse the future and are therefore subject to a high degree of uncertainty and hence an inherent risk of misrepresentation. Unfortunately, there is no uniform way of deciding what qualifies as a true and fair estimate. However, the uncertainty, the complexity inherent to estimates, the poor data used in order to make the estimates, are the ingredients for the estimates to be almost certainly biased. At this point, we can easily understand why accounting estimates are a challenge for auditors, why we talk about audit risks and factors that influence (improve or not) the audit of accounting estimates.

In this vein, our thesis shape these issues through one literature survey and three empirical researches that cover key related aspects. Before providing an updated literature survey, we considered it important to provide readers with a background on accounting estimates and fair value, the main topics of interest in this paper. Hence, our **first chapter** offers an overview on: the accounting and audit standards relating to accounting estimates and fair value, we provide definitions; we explain the process of making an estimate, the factors having an impact on auditing accounting estimates, the main reasons for their challenging character, or even the link with fair value measurements, considered as one of the most controversial accounting estimates. As already mentioned, the next step was to provide a literature survey on this subject. We brought together **in chapter two** the most relevant papers addressing the audit risk factors related to accounting estimates. According to the analysis of the selected papers, estimation uncertainty, management bias, professional scepticism or the use of a valuation specialist were the most debated topics. The findings reveal that an important number of studies put a lot of emphasis on the need for more indicators for management bias. Likewise, additional disclosure for accounting estimates and fair value, or more evidential support, decreases the auditors' likelihood of asking for adjustments. The authors of previous research state also the need for critical thinking, which has been proven to improve the audit of accounting estimates. Similarly, previous studies revealed that in the context of estimation uncertainty, the auditors seek advice from specialists influenced by the level of inherent and control risk but the auditors' overreliance on external parties was criticised by regulatory and oversight bodies. We identified some of the claims from previous research addressed by regulators in their amendments to accounting

estimates auditing standards, following our study in **chapter three**. We provided the convergence analysis of the two most important auditing standards, namely ISA 540 and AS 2501. This chapter has provided us with important and well summarized information on the new approach of auditing accounting estimates, initiated through standards amendments by the IAASB and PCAOB. The next empirical essay in **chapter four** reveals the influencing factors on fair value audit, analysing, for the Romanian setting, one of these factors, namely the valuation process conducted to estimate fair value, and in particular fair value estimate provider. The experiment we applied for our sample for two scenarios of internal control (weak and strong), provides insides of the Romanian auditing profession regarding the auditors' perception on the risk they should perceive and the effort they should undertake related to fair value source of estimation. Based on the results obtained, we review also the motivation and the linkage with the environmental and task-related influential factors of fair value estimate, such as complexity, uncertainty, managerial bias and standards guidance. The last chapter, **chapter five**, is an exploratory study and could be considered our attempt to find indicators of management bias related to the estimates. We emphasize the impact of financial restatements requested by auditors as corrections of material misstatements related to fair value and accounting estimates issues, in previous financial statements. We see these restatements as a red flag for the auditors in terms of risk of misstatement due to the fact that they are a consequence of management biased estimates. Therefore, we investigate the link between accounting estimates (with the related audit risks), financial restatements and the management opportunism assessed as earnings management, for a sample of 64 European companies, listed on U.S. financial market. The findings of this paper offer useful insights on whether restatements might diminish management opportunistic behavior in order to help auditors mitigate the audit risk related to accounting estimates.

Keywords: accounting estimates, fair value, audit risks, financial restatements, earnings management, ISA 540, AS 2501, audit standards, fair value measurements, discretionary accruals

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ABBREVIATIONS

AA - Audit Analytics

AICPA - American Institute of Certified Public Accountants

ANEVAR- National Association of Romanian Authorized Valuers

ASC - Accounting Standard Codification

EEA - European Economic Area

EFRAG - European Financial Reporting Advisory Group

FAS - Financial Accounting Standard

FASB - Financial Accounting Standard Board

FV - Fair Value

GAAP- Generally Accepted Accounting Principles

IAS - International Accounting Standards

IASB - International Accounting Standard Board

IAASB - International Auditing and Assurance Standards Board

IFRS - International Financial Reporting Standards

IVS - International Valuation Standards

IVSC - International Valuation Standards Council

PCAOB - Public Company Accounting Oversight Board

NYSE - New York Stock Exchange

GENERAL INTRODUCTION AND OVERVIEW

Context of the research

Over time, maintaining and enhancing the quality of financial statements was a priority both for the management and for the other interested parties. In this vein, the regulatory bodies have made sustained and constant efforts to support this goal through updated standards at the contemporary realities. The main purpose of the financial reports is to provide decision-useful information, free from manipulation and capable to represent the exact economic reality of the company. So, in theory, things seem simple and clear: the common goal is to have high-quality financial statements, to provide the most relevant information to investors, analysts and stakeholders. The question that has been asked directly or indirectly over time is what could prevent the achievement of this objective? The answers are multiple and intuitive and can be deduced by observing the realities and challenges in the economic environment in recent years.

First, the macroeconomic conditions could be one of the starting points. Thus, if we only think at the 2008-2009 financial crises, we are aware of its consequences for the economic activity. This kind of periods, with economic turbulence, is the perfect incentive for managers to manipulate numbers and to issue lower-quality financial reports. There are several reasons behind it, as: to hide poor performance, to increase personal compensation, to increase the share price etc. It may be that not only crisis periods lead managers to such decisions, but certainly then the pressure is greater. The next question that comes instinctively is: in what ways can managers manipulate the financial statements? The answers are once again multiple, but we will stop at those accounting elements with a big impact on earnings and that allow very easy manipulation, the so called *accounting estimates*.

Therefore, we introduce the main character or star of this research, namely the accounting estimates. We will discuss in the next chapter in detail about them, but for now we just want to emphasize that we are talking about elements that are based on subjective as well as objective factors, that involves subjective assumptions and measurement uncertainty and require a lot of professional judgment. Thus, there is the right context for the managers' incentives to manage earnings. Given the multiple possibilities that accounting estimates offer to manipulate numbers (given their subjective and uncertain character), the quality of financial reports can be called into question. This is why estimates are considered challenging and a continuing area of audit issues.

In the last years, the regulatory bodies have constantly worked on improving the audit standards regarding accounting estimates (IAASB, 2017; PCAOB, 2018; PCAOB, 2019), being aware of

the burden that these accounting elements impose on auditors. We could say that this is almost a "never-ending work", the proof being the continuous work of the normalizers to provide guidance and support to auditors. Recently, IFAC issued an implementation tool or a guide to assist auditors in implementing ISA 540 Revised (IFAC, 2022). On the other hand, PCAOB has initiated a request for comments on the initial impact of the new requirements for auditing accounting estimates and using the work of specialists (PCAOB, 2022). The aim of this initiative was to verify whether additional guidance may be appropriate. We will see in the next chapters of this research, that there is a joint and constant effort between regulatory bodies, professionals and researchers, in order to reduce the risks of accounting estimates on the quality of the financial statements and on the audit quality.

The ongoing work and attempts to improve the audit of accounting estimates is justified especially by the challenging times that have recently heightened the risks related to these elements. As suggested lately by professionals through the AICPA articles, one of the 4 key COVID-19 audit risks is related to the audit of accounting estimates (AICPA, 2020). In the same time, the International Forum of Independent Audit Regulators’ (IFIAR) reports showed that the deficiencies related to the audit of accounting estimates had one of the highest percentage in the inspection results reported in recent years (IFIAR, 2021; IFIAR, 2022). The latest report provides us with date on the last 5 years (2017-2021). As we can see in Figure 2, from the total deficiencies found within the 17 themes investigated, an important amount of these issues were related to accounting estimates, including fair value measurement (hereinafter, FV measurement). According to IFIAR’s analysis, the accounting estimates findings were on the 2nd place on the list of deficiencies. As we see, the auditors still struggle with estimates’ challenges.

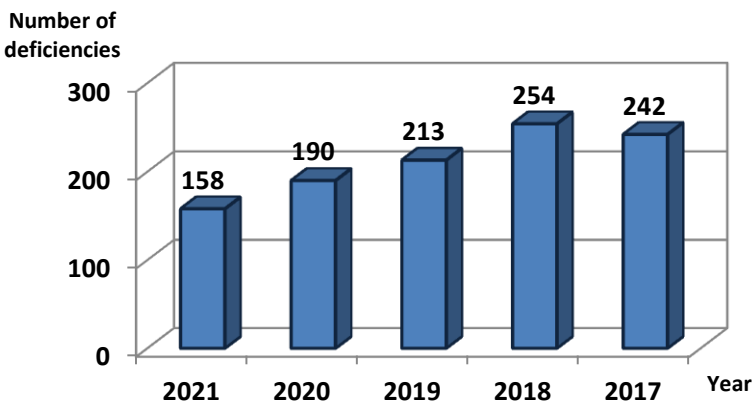


Figure 1. Number of accounting estimates audit deficiencies

Source of the data: <https://www.ifiar.org/?wpdmdl=13957>

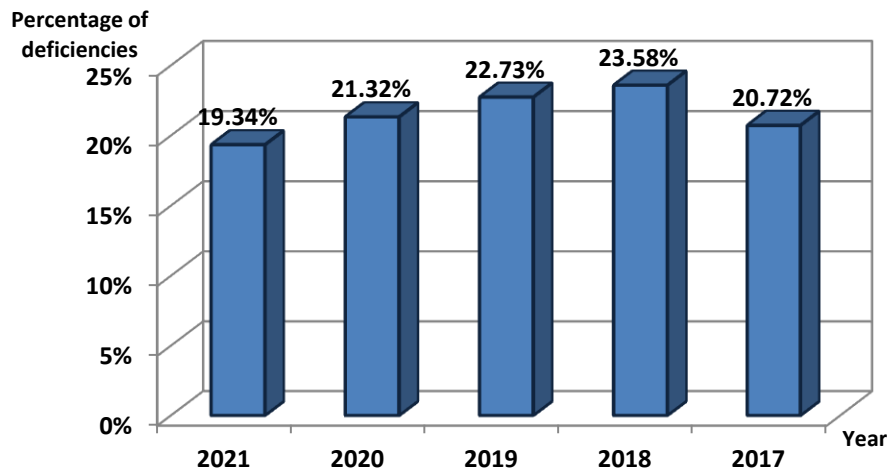


Figure 2. Percentage of accounting estimates audit deficiencies from the total number of findings

Source of the data: <https://www.ifiar.org/?wpdmdl=13957>

Given the demanding character of accounting estimates in terms of making them, but especially in terms of verifying them, the topic has seen a real interest from researchers. The theoretical and empirical findings in the field brought insights with respect to various issues direct linked to the audit of accounting estimates. We mention only a few of the main research directions, as: the estimation uncertainty, the management bias, the use of an external specialist, the professional skepticism (Christensen et al., 2012; Bratten et al., 2013; Griffin, 2014; Abernathy et al., 2015; Brink et al., 2016; Cannon & Bedard, 2017; Glover et al. 2017; Griffith & Hammersley, 2021). The researchers support through their work the attempt to mitigate the risks of accounting estimates on the auditors' work and on the other interested parties. Thus, they addressed these risks and the related issues (with a potential positive or negative impact) through a series of empirical studies, linking the professionals' claims with the improvement of accounting and auditing standards.

An important place in the debates regarding the audit of accounting estimates was occupied by the FV measurement as a significant form of accounting estimate. We addressed this particular form of estimate in our research as well, as it was a controversial subject, intensively discussed, especially during the financial crisis. Even if numerous authors paid special attention to the audit of FV measurements, empirical evidence for emerging countries can still be considered scarce.

Consequently, through this thesis we would like to contribute to the existent literature, to the ongoing debates on auditing the estimates and the auditors' reaction when facing accounting estimates complexity. In this vein, we provide through the next chapters one theoretical

approach, one literature survey, and three empirical essays, each with a contribution in the directions identified following the literature analysis.

A glimpse on the thesis' data, methodology and structure

Research' objectives, data and methodology

The aim of this research work is to provide original empirical evidence and to contribute to the literature on the audit risks related to accounting estimates and fair value. The initial goal was to explore the existing literature to identify the real challenges regarding the audit of accounting estimates. Next, based on that, the purpose was to offer empirical evidence on: the contribution of regulatory bodies on the pressing issues about estimates, the factors influencing the fair value audit and the auditor's reaction for an emergent context, and to find indicators of management bias related to estimates.

The present research has a multidisciplinary character, being at the intersection of the fields of accounting, audit, financial valuation, and tangentially management, fact that allowed approaching this subject from both *qualitative and quantitative* perspective. The role of qualitative research is to identify in the literature the information needed to clarify the analyzed concepts, its characteristics and the context in which it occurs. Quantitative research has the role of quantifying relevant aspects identified in the qualitative analysis, by testing and validating some hypotheses through specific methods.

In general, the content analysis and the systematization of data were used for the entire work, as for every chapter we performed a short literature review, or standards analysis as well as reporting the data and results in tables. In Figure 3 we present the PhD thesis structure by chapters.

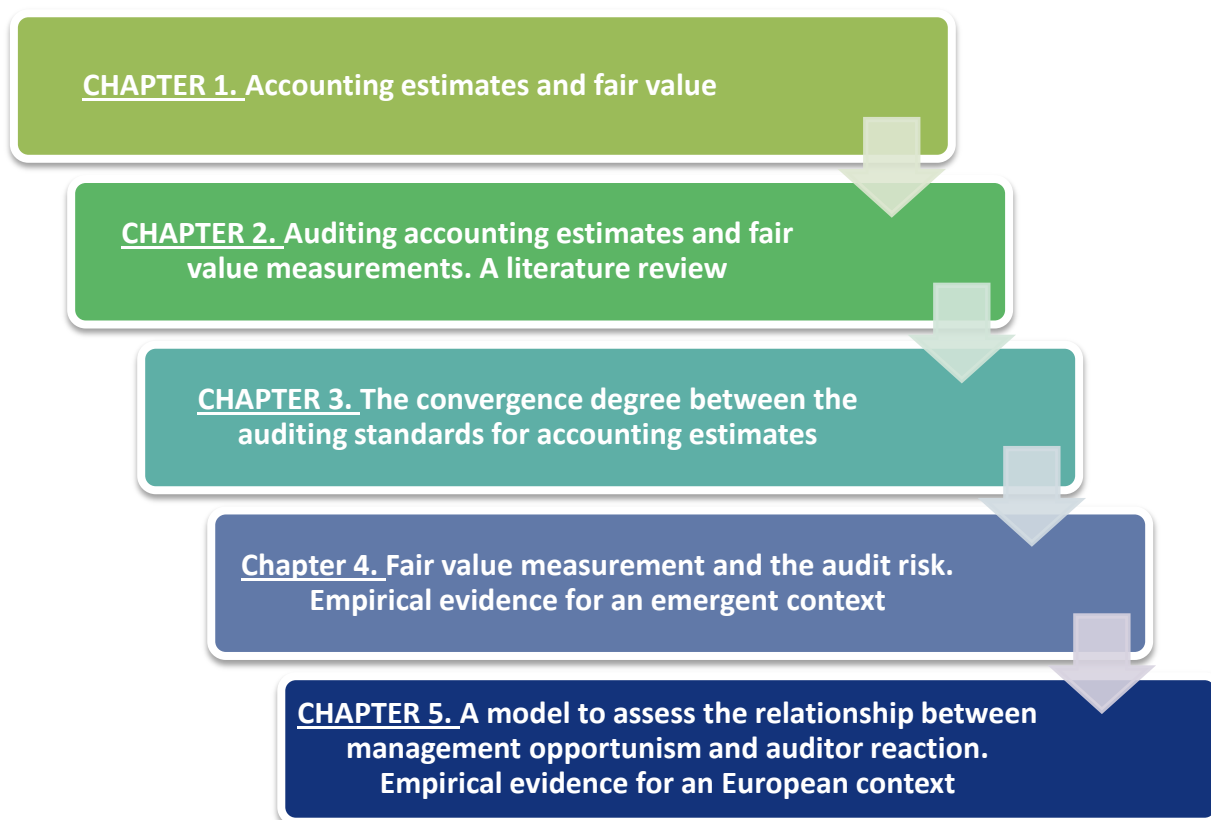


Figure 3.The chapter structure of our PhD thesis

In the first chapter, based on a *deductive reasoning*, we introduced accounting estimates in the debate, with a special focus on FV measurement, in order to see their specific link with the related audit risks. We used *content analysis* to explore the accounting and audit relevant regulation for both contexts, international and American. We also used *the systematization of the data* in tables. This was required as a means to identify the categories of estimates, the FV pros and cons and the items measured at FV under IFRS and US GAAP.

In the second chapter, we applied the *qualitative analysis* for the purpose of identifying the main research directions in the field, used later to substantiate the structure of our work. The purpose of the *quantitative analysis* was to describe the selected sample of articles with the aim of establishing the current state of knowledge regarding the audit risks related to accounting estimates and FV measurement. As regards the data, we selected 745 articles from three important databases, namely Web of Science (WOS), Springer Link, and Scopus. Being very restrictive and focusing on very particular topics regarding the audit of accounting estimates, the final sample was composed of the 60 most relevant articles.

The third chapter started with a *content analysis* appropriate to investigate the audit standards and the contribution of the new ones. Then, an *empirical analysis based on similarity and*

dissimilarity coefficients was performed, to determine the level of convergence between the American and international audit referential, compared also with the new issued standards.

The aim of the fourth chapter was to identify the influencing factors on FV audit and the auditors' way of perceiving and coping with these factors in their work. In order to carry out this study we used both *qualitative and quantitative analysis*. The qualitative analysis was performed to examine the audit standards and literature, in order to determine the influential factors of FV audit and their positive or negative effects. The auditors' reaction was revealed with the help of the *experiment method*. Then, we used the quantitative analysis in order to process the auditor's responses and to present the results of the experiment. Data analysis methods in this chapter include *univariate and multivariate analysis* as well as *simple effects tests*. Regarding the data, our sample consisted of 76 auditors from an emergent environment (the Romanian context). The experiment was previously tested on 160 students.

In the last chapter the *quantitative analysis* prevails, as we provide empirical evidence on the relationship of accounting estimates, related restatements and earnings management. To test and validate the working hypotheses we use *Ordinary Least Square (OLS) estimator*, along with *Fixed Effects* and *Random Effects models*. Given that our empirical analysis focuses on accounting estimates related restatements, the data collection was, to some degree, challenging. As financial restatements is not an act desirable for companies (being a measure of financial reporting quality), constructing a sample of financial restatements related to estimates issues was even more challenging. We managed to collect the data from Audit Analytics and Thomson Reuters Eikon databases, for a final sample of 64 companies, for a period of 18 years.

Thesis outline

Chapter 1 "*Accounting estimates and fair value*", is a preview for the subjects we will discuss in the next chapters and introduces accounting estimates and fair value as the main topics of the entire thesis. We felt it was important to provide this preview in order to give readers a clear picture of what accounting estimates mean, about their characteristics and the inherent challenges. Moreover, we explained how accounting estimates work and why they play such an important role for the financial statements quality. This allowed us to better understand the impact and their challenging character for the auditors' work. Likewise, we proposed a discussion on the theoretical research framework developed by Bonner, (2008) and Bratten et al. (2013) on factors affecting the quality of audit judgments as: environmental factors, task factors and auditor-specific factors. This allowed us to develop a link between the factors affecting the auditors' judgments and those affecting management's discretion, as stated by management

literature. This was the first step to substantiate our interest for the management bias in relation to accounting estimates and the associated audit risks. The introduction of fair value, as one of the most controversial estimates, was another step to understand it and to justify our choice to perform an experiment related to auditing FV measurements in chapter 4.

Chapter 2 "*Auditing accounting estimates and fair value measurements. A literature review*" represents our contribution to the analysis of the current state of knowledge regarding the audit of accounting estimates. We carried out a review of the most relevant articles from WOS, Springer Link, and Scopus, in various top journals in the field. The time analysis for the publications related to our theme revealed an increased trend in the last 10 years, proving a higher interest for this issue. At the same time, based on Bratten et al. (2013) framework and the discussion from the previous chapter, we reviewed the literature, with a focus on the main topics related to auditing accounting estimates, as: estimation uncertainty, management bias, professional skepticism, the use of valuation specialists and other audit quality consequences.

We are aware that the audit risks related to accounting estimates and FV measurements is a narrow and particular subject. This is the reason why we could not necessarily carry out an analysis of the literature on types of economies (emerging vs. developed) or financial markets. However, we observed that in general, the empirical studies focused on rather limited data, especially for the American capital markets. Thus, we saw that evidence on emerging markets can still be considered scarce.

Nevertheless, the conclusion of our literature review was that we can see the standard bodies' efforts to improve the audit of accounting estimates and their attempt to keep pace with the scholars' and the professionals' concerns expressed through research. Furthermore, this analysis showed us the very close connection between the factors identified by researchers as affecting the audit of accounting estimates or presenting particular risks. In this vein, we saw that uncertainty is a problem inherent to estimates, creating the perfect scenario for distortion or management bias. Undoubtedly, this has an impact on the audit task itself (skills and judgments, extra work, external specialist etc.) and the audit quality (adjustment/restatements requirements, financial reporting quality, litigation risks etc.); not to mention the obvious consequences for other interested parties.

Chapter 3 "*The convergence degree between the auditing standards for accounting estimates*" examines the level of improvement and the convergence degree between ISA 540 and AS 2501, the audit standards regarding the accounting estimates and FV measurements. During 2017-2020, both IAASB and PCAOB have coordinated their efforts and have initiated the revision of

these standards. Immediately after publishing the new updated references, we were interested to see how the efforts and plans of the normalizers in terms of convergence were realized. The aim of this study is to observe both the evolution of ISA 540 compared to the old standard and a comparison with the amendments proposed by PCAOB in the United States.

The motivation behind this analysis is primarily related to the topicality of the subject. Then we wanted to have a contribution to this international debate regarding the audit of accounting estimates. The importance of analyzing ISA standards is justified by the large adoption rate of ISA at global level- around 67% according to the latest IFAC reports. The relevance of the comparison between the American and the International norms is consistent with the effort of PCAOB to converge U.S. GAAP with ISAs, according to AICPA's Auditing Standards Board and their strategic plan (PCAOB; 2019).

To perform our analysis we used three similarity coefficients (Simple Matching, Rogers & Tanimoto, Sokal & Sneath) and one for dissimilarity (Euclidean Distance). Thus, it appears that regulatory bodies converged toward the same specific audit risks approach. We confirm this by the introduction of the complexity and subjectivity as inherent risk factors specific to the estimates for both referential and the emphasis on the need to exercise professional skepticism. This similarity (ISA540/AS2501) it was something to be expected and should be seen by auditors or stakeholders as the regulators' response to increase the quality of the audit, the existence of a more uniform approach for risks and obviously to increase the degree of convergence between standards. However, some elements differentiate the two standards, such as the use of different terms for external sources of information, for the person assisting the management in making accounting estimates, or different approaches for fair value.

Chapter 4 "*Fair value measurement and the audit risk. Empirical evidence for an emergent context*" is motivated by the sparse literature on auditors' behavior in relation to accounting estimates for emerging contexts. We investigate, through an experiment, how auditors perceive and behave in relation with one of the most important estimates, namely FV. We discussed about the influential factors, with a focus on FV provider.

Among our general research questions we asked ourselves why estimates are associated with risks, and what are the factors that determine these risks or involve a higher risk for auditors. Thus, in this chapter we focused on some of these factors and on one category of estimates (the fair value). One of the influential factors we addressed is the FV provider. We investigated if and in which cases the use by the management of an external expert versus the internal one, decreases the estimation risk and effort for the auditors. We correlated FV provider with the FV

estimation process. Hence, we chose two other factors as variables: FV measurement (with two valuation approaches- income and cost) and FV disclosure for the valuation report (focus on inputs characteristics, their source, and risk of volatility vs. focus on methods, assumptions and models). Therefore, through this experiment we focused on those measurable factors that we considered as having the potential to improve the audit process and minimize the related audit risks.

We found that auditors rely more on the expertise of an external valuator than on management estimations in specific circumstances. These specific circumstances are strong quality of the internal control and a component of FV reporting linked to the valuation methodology. This observation is in line with previous studies, who found that the auditors consider the FV estimation less risky if it is generated by an external source. On the other hand, a result that surprised us was the fact that income approach appeared as requiring more audit effort than the cost approach.

Therefore, this chapter contributes to the existing literature firstly by enlarging the discussion on FV estimates audit effort and risk of estimation over the entire process of valuation, not only FV provider. Secondly, we addressed a less explored item, the FV estimate issues for non-financial assets (the focus being usually on financial assets), for which the valuation process is even more difficult, prone to estimation risks, and to audit risks as well. We emphasize also the incomplete understanding of the auditor facing the risk and complexity of FV and which confirms the lack of sufficient expertise in terms of valuation issues, for the particular case of developing countries. The results showed that the quality of the valuation report and the process in terms of sufficient description of inputs and approaches could minimize the audit risk and additional audit effort.

Chapter 5 *"A model to assess the relationship between management opportunism and auditor reaction. Empirical evidence for an European context"* represents another answer to our research questions related to the audit risk factors in the case of accounting estimates and FV. One of these factors is management bias. Thus, our main concern- finding indicators of management bias related to the estimates- is justified by the recent literature that claims the need of such indicators for the auditors. We emphasize the impact of financial restatements requested by auditors as corrections of material misstatements related to fair value and accounting estimates issues, in previous financial statements. We see these restatements as a consequence of management biased estimates, thus as a red flag for the auditors in terms of risk of misstatement.

Therefore, we investigate the link between accounting estimates (with the related audit risks), financial restatements and the management opportunism assessed as earnings management. Our analysis is performed on a sample with 64 European companies, listed on U.S. stock exchange, from 2000 to 2017. Using Audit Analytics database we selected for our sample only those companies having accounting estimates and other accounting options related restatements. We chose European companies firstly because evidence related on restatements is limited for Europe. Moreover, studies linking restatements with accounting estimates and earnings management for this context are scarce.

Our results provide evidence about the effect of restatements on earnings management practices and hence on the FRQ. The results of our model identified earnings management practices for a sample of European companies listed on NYSE. Furthermore, the econometric treatments revealed a negative correlation between restatements asked by auditors for accounting estimates issues and discretionary accruals. This result confirms that restatements asked by auditors in one year can potentially decrease the managers' opportunistic behavior in the next period. Therefore, our study contributes to the existing literature on accounting estimates, audit risks, restatements and earnings management, by providing results about the reaction of firms with estimates related restatements.

Chapter 1

1. ACCOUNTING ESTIMATES AND FAIR VALUE

1.1 The role of accounting estimates

Taking a look from the outside, we see accounting as a science that should provide the users with relevant information and faithful representation of the financial statement's elements, as stated in the IASB's Conceptual Framework (IASB, 2018). Despite all the characteristics of the financial data, there are elements that are subject to significant judgment and estimation uncertainty. This is not something new for the accountants, but they still must consider these essential characteristics even when it comes to these elements, namely accounting estimates. The most common reason that first comes to our mind is the impact of these estimates in the decision-making process for all users of accounting information. Now, more than ever, the accounting estimates are an important part of the financial statements, with a significant impact on companies' financial results. To be more specific, we can think of one of the most common examples of estimates related to measuring the cost of an asset. Estimating the useful life, the residual value or measuring the fair value implies alternatives and a certain level of subjectivity. These possible alternatives specific to the asset's measurement process may lead to obtaining at least two different estimates for a single item, which means different accounting information. Therefore, the financial statements users and their business decisions can be easily influenced by one or another result obtained from estimating the value of an asset.

Before describing the impact of these estimates we should take the first step with the definition or with an explanation allowing the reader to better understand the concept and to be able to form a logical thread. Our work in this chapter is based on the accounting standards related to accounting estimates (IAS 8) and further on the main FV measurements accounting standards (IFRS 13 and FAS 157). Besides this, as a first step, we identify the main literature that brings to the attention and discusses the challenges of accounting estimates, work that will be further explored in the next chapter

On 12 February 2021, the International Accounting Standards Board (IASB) issued amendments to IAS 8 *Accounting Policies, Changes to Accounting Estimates and Errors*, introducing the definition of accounting estimates (IASB, 2021). The amendments are intended to delineate between changes in accounting estimates and changes in accounting policies and the correction of errors. Therefore, the accounting estimates are "monetary amounts in financial statements that are subject to measurement uncertainty" (IASB, 2021).

It should be noted that the Board pays special attention to this special feature of the estimates-the measurement uncertainty, and the fact that they demand the use of judgements or assumptions. In the literature, for several years, attention has been drawn to this specific uncertainty of accounting estimates, with great impact as well on auditors' work (Bell and Griffin, 2012; Christensen et al. 2012; Bratten et al. 2013; Griffin, 2014; Joe et al. 2017).

Thus, to better understand the impact of the recent amendments on IAS 8, which are of interest to us as well, we have drawn up a diagram to illustrate the IASB position (Figure 4). When a company prepares the financial statements, it faces the need to choose an accounting policy and to determine the accounting estimates, if necessary. The accounting standards assert that accounting policies are the specific principles and procedures enforced by the company's management for preparing its financial statements (IASB, 2018). In the case of certain accounting policies, some of the financial statement items may need an estimation. In order to obtain the accounting estimates, judgments or assumptions are needed and such cases involve a certain level of measurement uncertainty. Subsequently, the international normalization body emphasizes that if a change in an input or a change in a measurement technique occurs, then, we can talk about a change in accounting estimate if it does not result from the correction of prior period errors.

Several examples of accounting estimates provided by the Board include (IASB, 2021): a loss allowance for expected credit losses, (applying IFRS 9 *Financial Instruments*); the net realizable value of an item of inventory (applying IAS 2 *Inventories*); the fair value of an asset or liability (applying IFRS 13 *Fair Value Measurement*); the depreciation expense for an item of property, plant and equipment (applying IAS 16); a provision for warranty obligations (applying IAS 37 *Provisions*).

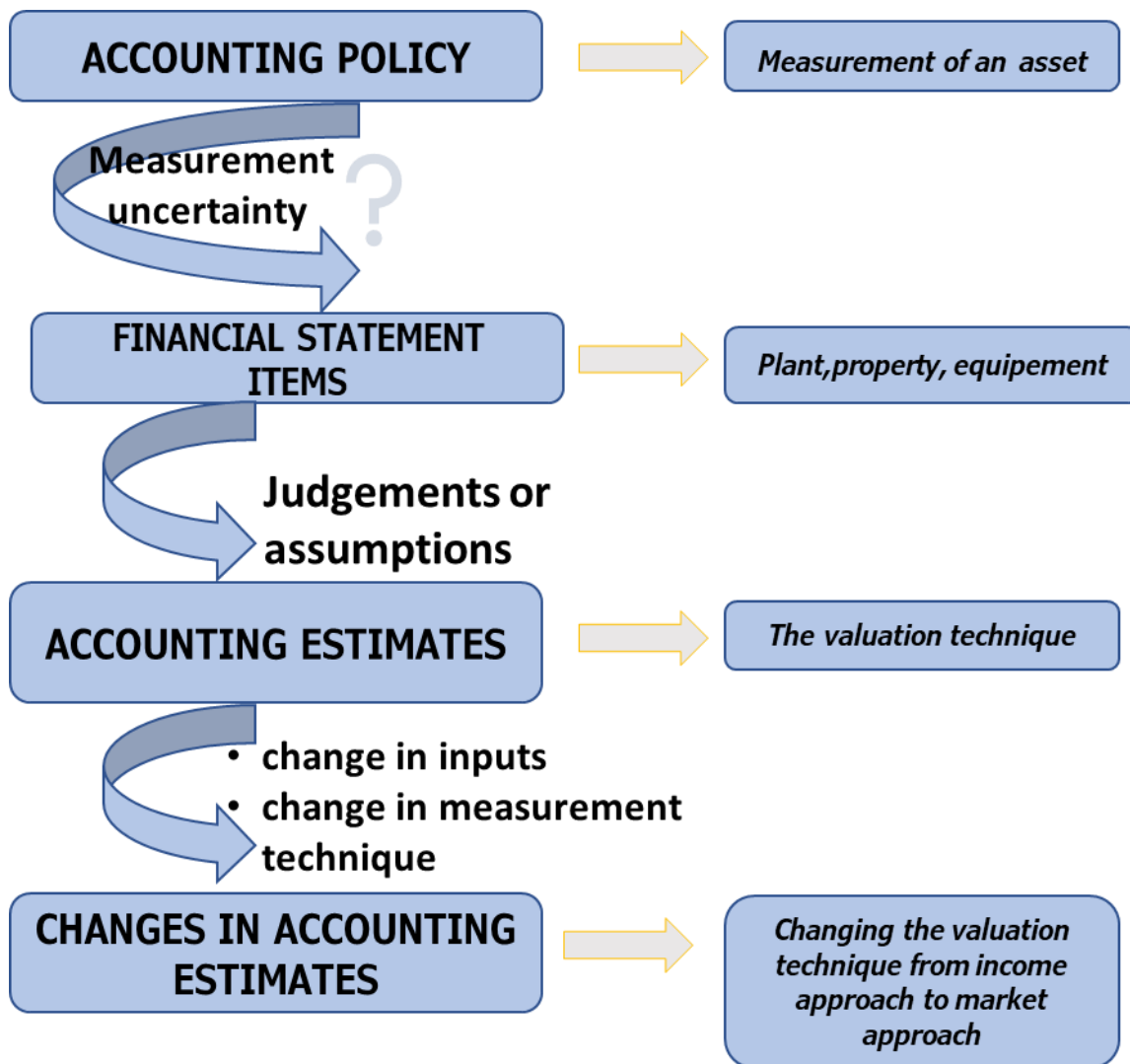


Figure 4. Accounting estimates process and changes in accounting estimates

The amendments of IAS 8 become effective for the entities for annual reporting periods beginning on or after 1 January 2023 and apply to changes in accounting policies and changes in accounting estimates that occur on or after the start of that period (IASB, 2021).

Some of the reasons why we need these accounting estimates could be deduced from what we have discussed so far. Firstly, as the definition states, there are some items in the financial statements that cannot be measured properly; hence, to have a value for those items the entity must prepare an estimation (IASB, 2021). The need for a correct value for some accounting elements is the first reason of the existence of these accounting estimates. Unfortunately, as Lugovsky & Kuter (2020) assert, the development of reliable financial statements, especially in the context of the digital economy is more challenging than ever, especially because of these choices available to the economic entities.

It can be easily observed that estimates are based on subjective data and, in consequence, the managers are required to employ judgments or assumptions, otherwise stated they are given discretion in the measurement process. To estimate an amount for the financial statements are needed three main components, as presented in Figure 5. As noted, all these elements impact the determination of the accounting estimate. As International Auditing and Assurance Standards Board (IAASB) illustrates, assumptions may vary with sources of the data and the judgments issued by the management to support them. Besides, a method is applied based on a model (computational tool or process) and involves applying these assumptions and data (IAASB, 2019).

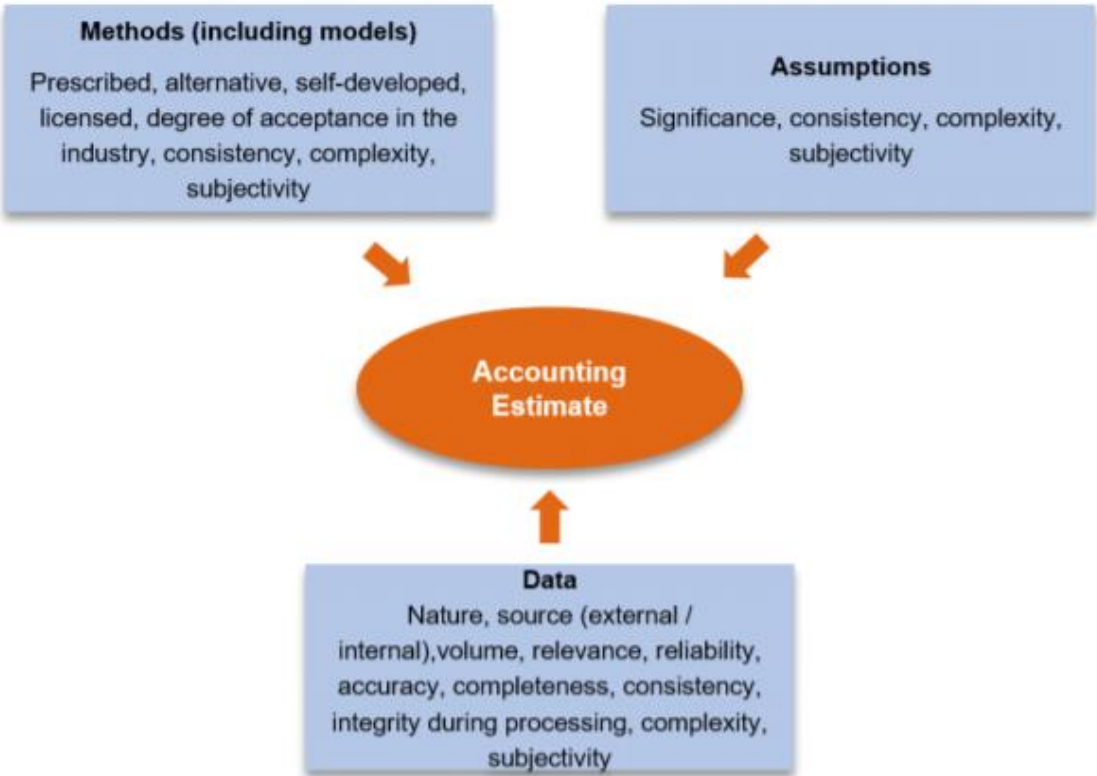


Figure 5. Inputs to determine accounting estimates, Source: IAASB, 2019

Thus, when generating an estimation, given all these inputs and the process, a high level of measurement uncertainty is present. Bratten et al. (2013) specify in their paper that measurement uncertainty might be considered as "ambiguity in the valuation of an accounting item or in the estimation of a different value". Moreover, the diverse range of existing models and the fact that the management can select the most opportune, play an important role in increasing the level of uncertainty of these estimates (Bratten et al. 2013).

Further, if we consider the scholars' view or the management literature (see Hambrick & Finkelstein, 1987; Crossland & Hambrick, 2007), there are four categories of factors that

influence the management's discretion: task environment (i.e., industry factors), the internal organization (i.e., firm factors), the managerial characteristics (i.e., individual factors) and national institutions (i.e., country-level factors). We could correlate these studies with the factors affecting the audit of fair value and other estimates, examined by Bratten et al. (2013). They used the theoretical research framework built by Bonner, (2008). The authors mention three categories of factors affecting the quality of audit judgments as: environmental factors, task factors and auditor-specific factors (Bonner, 2008; Bratten et al. 2013). We will address this topic in a more comprehensive way, but for the moment we want to emphasize that the factors that affect management's discretion in relation to financial statements are similar to those that affect auditors' judgments when it comes to auditing accounting estimates. The relevance of these factors was analyzed both from the perspective of management literature and from the perspective of accounting and auditing scholars. Through Figure 6 we brought together the theoretical research framework establish by Bonner, 2008 and the conclusions of management researchers.

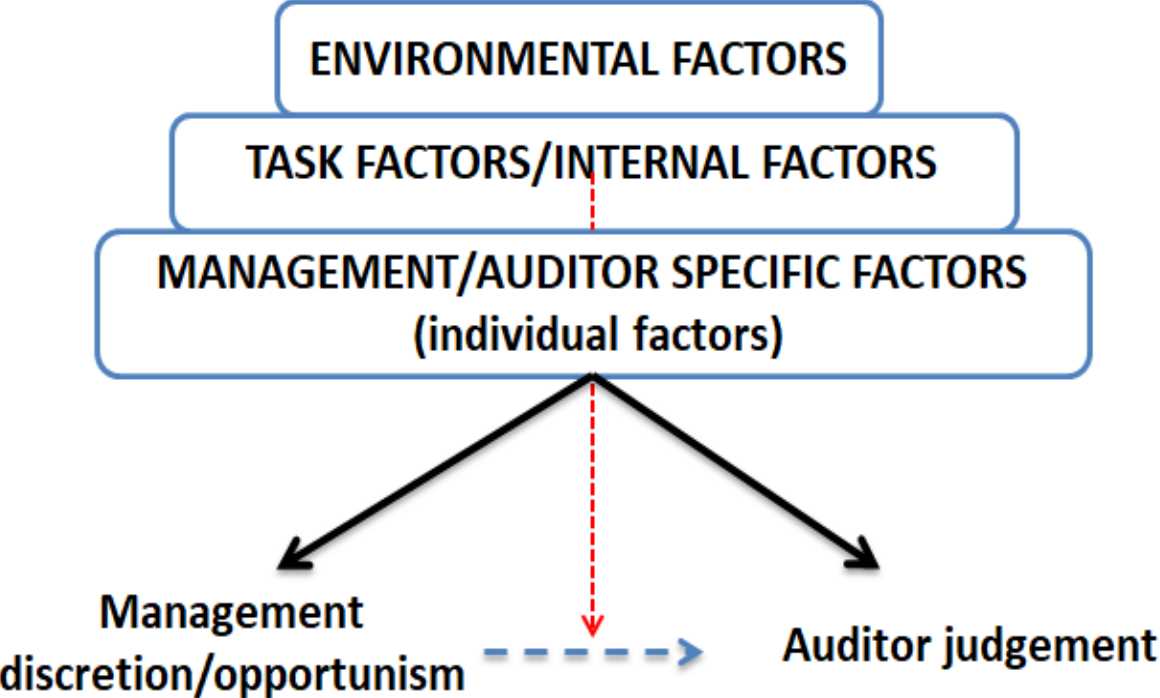


Figure 6. The relationship between the factors affecting management's discretion and the auditor judgement

Thereby, the challenging character of the accounting estimates can be easily explained by these elements, that for certain reasons, cannot be avoided. First, every industry is affected by the business environment and conditions, aspect that can increase management pressure to achieve certain financial performances and as a result, there is the possibility that management estimates are intentionally biased (PCAOB, 2011), being the case of FV measurement. The likelihood of

biased estimates affects also the audit quality. From auditor's perspective (Bonner, 2008; Bratten et al. 2013), the environmental factors affecting the audit quality for accounting estimates are the estimation uncertainty itself and the interaction between the audit firm and the outsiders (i.e. the regulatory and legal context, the relationship with the auditee or with the external valuation specialists). Related to the firm-level factors or firm characteristics (size, sales volatility, investment opportunities, insider ownership etc), they certainly affect the earnings quality, since they induce extensive use of managerial discretion (Dechow & Dichev, 2002; Gaio, 2010). In the same time, the audit-task factors discussed in the research framework already stated, are the difficulty of the task itself and the opportunities and incentives for management bias (Bonner, 2008). Hence, we see how easily can be set a connection between the firm factors affecting the management discretion and accordingly this managerial discretion has an impact on the auditor's judgment. As regards the individuals' factors, such as the valuation knowledge and expertise, the professional skepticism, the individual's ability to face uncertainty or difficult tasks, they must be seen as inherent. We must acknowledge that we have either a decision-maker (the management), or an evaluator of the choices made by the management (the auditor) and it is impossible that the specific characteristics of each individual do not influence the role that each one has.

1.2 Fair value measurement - a form of accounting estimate

As the financial market and the economic reality have undergone significant progress (in terms of financial information requirements or the development of new and innovative sectors in the capital market), the accounting system required an adjustment as well, referring in particular to the measurement basis. Hence, considering the evolution of capital markets, the needs of investors and the need to have a harmonized accounting system it was necessary in one way or another, to move from historical cost, as a measurement system, to fair value (Deaconu, 2009). The standard-setting bodies, the accounting professionals and scholars have already debated this topic from many points of view, because it gave rise to a polemic (e.g. Laux & Leuz, 2009).

In order to better understand this concept, we will present a series of information meant to introduce fair value in our debate on accounting estimates.

As stated by IFRS 13 - *Fair value Measurement*, "fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date" (IASB, 2011). The idea of this measurement approach is that it notes the changes in the assets and liabilities' value, condition not integrated into the case of historical cost. Even though some defend rather the historical cost (Casta & Colasse, 2001; Penman, 2007;

Wallison, 2008) or a mixed model approach, using both fair value and the cost principle accounting (Laux & Leuz, 2009; Power, 2010), the concept of fair value was proposed in order to bring more relevance, objectivity and transparency. Once the 2008 financial crisis triggered, criticisms of fair value have intensified. Although an important number of researchers (Laux & Leuz, 2009; Barth & Landsman, 2010; Laux & Leuz, 2010) focused on this topic and managed to justify that fair value accounting was not the main cause in this crisis or played a minor role, its challenging character still remains. As stated in prior research (Deaconu, 2009; Walliser, 2012a; Walliser, 2012b), fair value has both advantages and disadvantages, but there are solutions for its proper use and interpretation, and regulators have made significant efforts to clarify what was required.

To emphasize the connection between fair value and accounting estimates we evoke the so-called fair value hierarchy. For the valuation of assets and liabilities, IASB established a three-level hierarchy of FV measurement inputs: Level 1 inputs (quoted prices in active markets for identical assets or liabilities- listed shares); Level 2 inputs (observable but not identical, only similar assets or liabilities- real estate assets) and Level 3 inputs (are unobservable but based on the best information available- intangible assets) (IASB, 2011). Thus, if values for level 1 and 2 are not available, then the fair value should be estimated using certain valuation techniques. Here comes the estimation, because fair value accounting measures the actual or the estimated value of an asset if market price is not available. Besides, the audit standards always included fair value in the discussion related to the audit of accounting estimates, even if the revised ISA 540 (*Auditing Accounting Estimates and Related Disclosures*) removed it from the title of the standard.

We consider it useful to examine further the advantages and disadvantages of FV measurement, to have an exhaustive picture of it. This debate on pros and cons allows us to see why this subject intrigued the stakeholders and how its characteristics impact the audit of estimates, including fair value; the subject that concerns us most.

First of all, comparing to historical cost, fair value is inherently more transparent, the information provided by the financial statements being more reliable and accurate. This happens because FV is based on current market information. Fewer assumptions are required, compared to historical cost when FV uses quoted prices from liquid markets. This is useful for potential investors and other stakeholders. Even when there is no active market, the valuation models are based mostly on market information and the value relevance still remains for all FV levels (Deaconu, 2009; Filip et al. 2021). By active market we mean, as IFRS 13 states, "a *market in*

which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information" (IASB, 2021). Nevertheless, we consider that in some circumstances the reliability and the objectiveness of fair value can be controversial, especially when there is not a liquid market. This issue is a step into uncertainty, because of the valuation models and the manipulation option given to managers, exactly what the auditors claim.

Secondly, FV is richer in information, once because of the disclosure requirements and then because, as a market based approach, FV incorporates information from all market participants (ACCA, 2009). Furthermore, this informative character allows a better comparison of entity's performances as long as it reflects the actual value, and not only the original value of the accounted item.

Thirdly, as evidenced by Deaconu, (2009), FV reduces the differences between the historical cost (or book value) and the market value for the listed companies. Likewise, it allows better daily management of financial market risks.

In addition to these considerations, FV embraces more categories of assets or even liabilities, since it is a method able to capture the changing circumstances on the market. As stated by professionals and regulators, FV was the only way to have a proper disclosure of some accounting items or transactions in the balance sheet (financial derivatives).

Concerning the FV's criticism, there is the risk of using unreliable values, in absence of an active market. This issue puts into question the relevance of the reported financial information. The use of unobservable inputs and the models applied, contribute to the uncertainty level and consequently to the existence of a biased behavior or manipulation.


Another concern was related to the technical problems brought up by FV and also some unexpected costs. The latter issue was addressed within the post-implementation review of IFRS 13, concluding that the application of IFRS 13 did not appear to lead to unexpected costs (IASB, 2018b).

The volatility of some financial markets was another problem that has not been solved within the FV approach. The volatility of reported profits is undoubtedly determined by reporting the changes of value in net income. This point is closely related to the fact that FV (Level 3 - mark to model methodology) accentuates the pro-cyclicality of the financial system performances for a business (amplifying the rises or declines in value) (Véron, 2008).

Although the investors seemed to support from the beginning FV, having the advantage of more transparency and more relevant information for them, this may not produce the same effect for the other users. Therefore, it has been claimed that FV disadvantages certain categories of users by not providing the most suitable financial information for everyone.

As stated in the literature but also by regulators and professionals, fair value is "a never-ending debate" (Marra, 2016). Despite all the arguments, the experience acquired in the field, the studies conducted so far, there are different opinions, with supporters and opponents of the concept. Not so long ago, the European Commission requested EFRAG (European Financial Reporting Advisory Group) to investigate alternatives to fair value for long-term investment portfolios of equity (EC, 2018). So, we see that the debate about the FV usefulness for the stakeholders continues. A synthesis of the above discussed advantages and disadvantages is presented in Table 1.1.

Table 1.1 Fair value pros and cons

<i>FV pluses</i>		<i>Controversial issue-still in debate</i>
Transparent	FV is based on current market information	FV reliability and objectiveness: concern over the reliability of values in illiquid markets → Financial statements  <ul style="list-style-type: none"> • Uncertainty? • Manipulation? • Earnings management? • Additional audit risks
Richer in information	FV incorporates information from all market participants	
Financial market risks supervision	FV allows a better daily management of financial market risks	
Comprehensive	FV embraces more categories of assets or even liabilities (see financial derivatives treatment)	
<i>FV minuses</i>		
Technical problems	FV implementation-additional cost and technical issues	
Volatility of financial markets	FV risks overstating values and profits/declines in value	
Inappropriate for the needs of all users	FV disadvantage certain categories of users by not providing the most suitable financial information for everyone (suitable for investors)	

1.3. Fair value accounting regulation

The most important actors, namely the investors, ask for transparent information about how fair value was measured and its impact on current financial statements and on future periods. The debate on this topic is still open since the companies have to meet high expectations for the interested parties.

To keep pace with the economic development and definitely to help the relevant actors, the standards setters have committed, and they are still interested, to strengthen the convergence on fair value definition, measurement and disclosure system. The common effort of IASB and FASB lead to substantially converged FV measurement and disclosure guidance (PWC, 2019; KPMG, 2020). We are interested in both standards first of all because they influenced and set up a trend for the rest of the world and secondly because our area of interest for this research are the European companies listed on the US stock exchange (see Chapter 5). It should also be mentioned that IFRS standards are often influenced by US GAAP standards and we will see that sometimes the American regulatory body was one step ahead of the IASB.

We believe that it is important to give close and thoughtful attention also on FV accounting regulation, the fair value being one of the most controversial accounting estimates. An important amount of accounting items and especially the financial assets and liabilities require FV estimate and in many of the cases, they are subjectively estimated based on level 2 and level 3 inputs. Therefore we believe that the accounting standards deserve this analysis, as it is undeniable that the accounting regulation has an impact on the audit of estimates - the subject of this research. Previous studies (Smith-Lacroix et al. 2012; Griffith et al. 2015a) claim that the accounting standards have their contribution to the increasing complexity and make the auditor's work more challenging.

The American Financial Accounting Standards Board (FASB) originally released ASC (Accounting Standard Codification) Topic 820 (also known as FAS 157 - *Fair Value Measurements*) in September 2006, five years earlier than IASB. The International Accounting Standards Board issued the equivalent standard under IFRS 13 in May, 2011. To continue the convergence process, FASB published the same year ASU (Accounting Standards Updates) 2011-04, *Amendments to Achieve Common Fair Value Measurement and Disclosure Requirements in US GAAP and IFRSs*. In addition, in the following years they continue to issue new updates to align the two accounting standards (as: ASU 2015-07, *Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share (or Its Equivalent)*),

issued May 2015; and ASU 2018-13, *Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement*, issued August 2018).

Even if there are still some divergences between US GAAP and IFRS, both standards define in the same way the concept of fair value, demand for common (but not identical) disclosures about FV measurement and they have a common understanding on fair value hierarchy related to the source of the inputs used to estimate it. At this time, IASB launched a project to improve the disclosure requirements of IFRS 13. As the main objective of this pilot approach, the Board set up to enhance the FV level of disclosure under IFRS 13 so that the users of financial statements can better understand how FV measurements have been determined and how changes in those measurements affect the financial statements. The exposure draft was subject to comments until January 2022 (IASB, 2021) but a decision regarding the changes will be made in the 3rd quarter 2022.

The high-level disclosure objectives would allow stakeholders to gain a better understanding particularly on the following items: "the amount, nature and other characteristics of the classes of items within each level of the fair value hierarchy; the significant techniques and inputs used in the valuation; the significant drivers of changes in the FV measurements over a reporting period; and the range of reasonably possible fair values at the reporting date" (IASB, 2021).

As regards the American regulatory body, they were again one step ahead with the disclosure requirements. Thereby, ASU 2018-13, *Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement*, amends the disclosure requirements under Topic 820 (FASB, 2018). Therefore, we expect that the differences between US GAAP and IFRS Standards in the disclosure rules will decrease considerably due to the IASB's updates. At the moment, fair value disclosure requirements under US GAAP are different for public and non-public entities. In return, under IFRS, these disclosure requirements apply to all entities, nevertheless their public status.

Along with the FV accounting standards, we also mention the importance of International Valuation Standards (IVS) released by the International Valuation Standards Council (IVSC), with whom IASB established a statement of protocols for co-operation (IVSC, 2014). The IVSC issued the valuation standards and guidance on fair value and other valuation measurements to strengthen the valuation profession. The common interest, to have a consistent measure of FV for financial reporting, brought IVSC and IASB to this agreement.

When it comes to the items that are required to be measured at FV under the International and American standards, we present them in the Table 1.2, below.

Table 1.2 Items measured at FV under IFRS and US GAAP

STANDARDS FOR FV	
IFRS - IFRS13	US GAAP - FAS157 (Topic 820)¹
Business combination - assets acquired and liabilities assumed (IFRS 3)	Financial assets/liabilities eligible for fair value option (ASC 825-10)
Noncurrent assets held for sale and discontinued operations (IFRS 5)	Distinguishing liabilities from equity (ASC 480)
Consolidated financial statements - investments in subsidiaries by investment entities (IFRS 10)	Business combinations (ASC 805)
Revenue (IFRS 15)	Financial instruments (ASC 825)
Property, plant and equipment - revaluation model and exchange of assets (IAS 16)	Property, plant, and equipment (ASC 360),
Employee benefits - post-employment benefit obligations (IAS 19)	Employee benefits (ASC 715 and ASC 960)
Intangible assets - revaluation model (IAS 38)	Asset retirement and environmental obligations (ASC 410)
Impairment of assets-nonfinancial assets (IAS 36)	Debt and equity investments (ASC 320)
Investment property (IAS 40)	Goodwill and intangibles (ASC 350)
Agriculture-biological assets (IAS 41).	Stock compensation (ASC 718)
Financial instruments (IFRS 9)	Derivatives (ASC 815)
Investments in associates and joint ventures-held by mutual funds and similar entities (IAS 28)	Guarantees (ASC 460)
	Nonmonetary transactions (ASC 845)
	Hybrid financial instruments (ASC 815-15)
	Transfers and servicing (ASC 860)
	Exit and disposal costs (ASC 420)
	Troubled debt restructurings (ASC 470-60)
	Derecognition of Nonfinancial Assets (ASC 610-20)
	Leases (ASC 842)

¹ With a few exceptions within these standards

Furthermore, we will present some of the most significant differences related to FV measurement and disclosure, under IFRS and US GAAP, the two most important and influential standards applied globally (Table 1.3).

Table 1.3 Differences between IFRS and US GAAP related to FV measurements

	<i>IFRS 13</i>	<i>FAS 157</i>
<i>Day one gains & losses</i> (when the transaction price and the fair value are not equal)	For the financial instruments, the differences between FV and the transaction price are recognized as a <i>day-one gain&loss</i> ” only when FV is evidenced by a quoted price in an active market for an identical asset or liability(i.e. Level 1 input) or based on a valuation technique that uses only data from observable markets.	The recognition of a <i>day-one gain&loss</i> can be accepted even if the inputs used to measure the FV are not observable (unless other prescriptions)
<i>Measuring the fair value for certain investments</i>	IFRS does not have guidance for measuring alternative investments, allowing the use of Net Asset Value (NAV). The reason for this is the inconsistency for calculating the NAV around the world.	A practical expedient (method/tool/guidance) allows to measure the FV of certain investments at a Net Asset Value (NAV), under certain conditions. It applies in entities that are substantially similar to investment companies (employ the same measurement principle)
<i>Disclosure differences</i>	FV disclosure requirements under IFRS apply to all entities	Topic 820 has different disclosure requirements for public and non-public entities.
<i>a. Transfers between levels of FV hierarchy</i>	Entities are required to disclose the amount of, and reasons for, transfers between Level 1 and Level 2 for assets and liabilities measured at FV on a recurring basis. For the transfers between Level 1 and Level 2 and for transfers into or out of Level 3 of the FV hierarchy, entities are required to disclose the policy for determining when the transfers are considered to have taken place.	Under US GAAP such disclosures are required only for Level 3 and for the recurring* FV measurements.
<i>b. Description of valuation technique and inputs used</i>	The entities have to present a description of the valuation techniques used and the changes	Required only for Level 2 and 3, (for recurring and non-recurring* FV measurements)

	and reasons for the changes in these techniques (if some have occurred). If there are assets and liabilities that are not measured at FV in the statement of financial position but for which FV is required to be disclosed, the entities have to disclose the inputs used.	
<i>c. Range and weighted average of significant unobservable inputs</i>	No specific requirements under IFRS	Required to be disclosed for public business entities only (for recurring and non-recurring* FV measurements)
<i>d. Description of the valuation process for Level 3</i>	Entities are required to provide a description of the valuation processes used (e.g. how an entity decides its valuation policies and procedures) for recurring and nonrecurring FV measurements categorized within Level 3 of the FV hierarchy	There aren't such requirements under US GAAP.

* Recurring FV measurements arise from assets and liabilities measured at fair value at the end of each reporting period. Non-recurring FV measurements are FV measurements that are triggered by particular circumstances that may occur during the reporting period (KMPG, 2020)

Source: PWC, 2019; KMPG, 2020; RSM, 2020

Therefore, after a short analysis of differences between FAS 157 and IFRS 13, we conclude that they relate specifically to disclosure requirements. However, at the moment, the two regulatory bodies are on a good path in terms of convergence. The American FASB has already updated the disclosure obligations through ASU 2018-13, so we look forward to the conclusions of the improvement project launched by IASB this year.

After analysing FV in terms of benefits and risks and comparing requirements under IFRS and US GAAP, we notice that FV is a constantly developing topic that demands continuous efforts from the standard setters. As the most notable and challenging of the accounting estimates, FV will experience significant changes, especially in the context of COVID-19 coronavirus pandemic. The economic activity and financial markets were affected considerably in 2020. Certainly, the accounting estimates in general, and the FV in particular, will be sensitive to this overwhelming sanitary crisis affecting the global economy. To continue reporting reliable estimates, the companies and their management will have to make significant efforts given the risks and market conditions at the measurement date. The increasing risks and a higher uncertainty may lead to more significant unobservable inputs, and thus, to more judgments and assumptions.

The challenge is not specific to the entities or the management only, but especially to the auditors. They still had a difficult task due to uncertainties surrounding the estimates but also many issues, such as indicators for management bias. Therefore, through this work, we will try to contribute in this regard. We aim to understand the audit risks related to the accounting estimates and the FV, the way in which auditors perceive these risks and how they react to management opportunism.

Chapter 2

2. AUDITING ACCOUNTING ESTIMATES AND FAIR VALUE MEASUREMENTS. A LITERATURE REVIEW

The previous chapter presented several aspects regarding accounting estimates: definition, conceptual delimitations, categories of estimates, and general characteristics of the estimates; with an emphasis on fair value, one of the most common accounting estimates. In addition, we highlighted the fact that these accounting items remain a pressing issue, as evidenced by the interest of regulatory bodies in improving these standards.

In this chapter, we conducted a review of the academic literature associated with the audit of accounting estimates and FV measurements. This approach is required firstly because it allows a better understanding of the field and the conceptual characteristics of our 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 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).

That is why, it is obvious that auditing accounting estimates, subject to estimation uncertainty and implicitly to management bias, is a challenging task for the auditor. We provided Figure 7 in order to have an image of what we call the concerns raised by the audit of accounting estimates.

Throughout the process of preparing the financial statements, accounting estimates are subject to a high level of subjectivity. Management is aware of this specific feature; thus, bias is nearly inevitable in most estimates. Likewise, there are environments where business conditions can increase management pressure to achieve certain financial performance and as a result, there is a possibility that management estimates are biased (PCAOB, 2011). The business conditions with their specific uncertainty and the inherent subjectivity create a perfect scenario of uncertainty for the auditors when auditing accounting estimates. In this context, the estimates are expected to be subject to an inherent risk of misstatement.

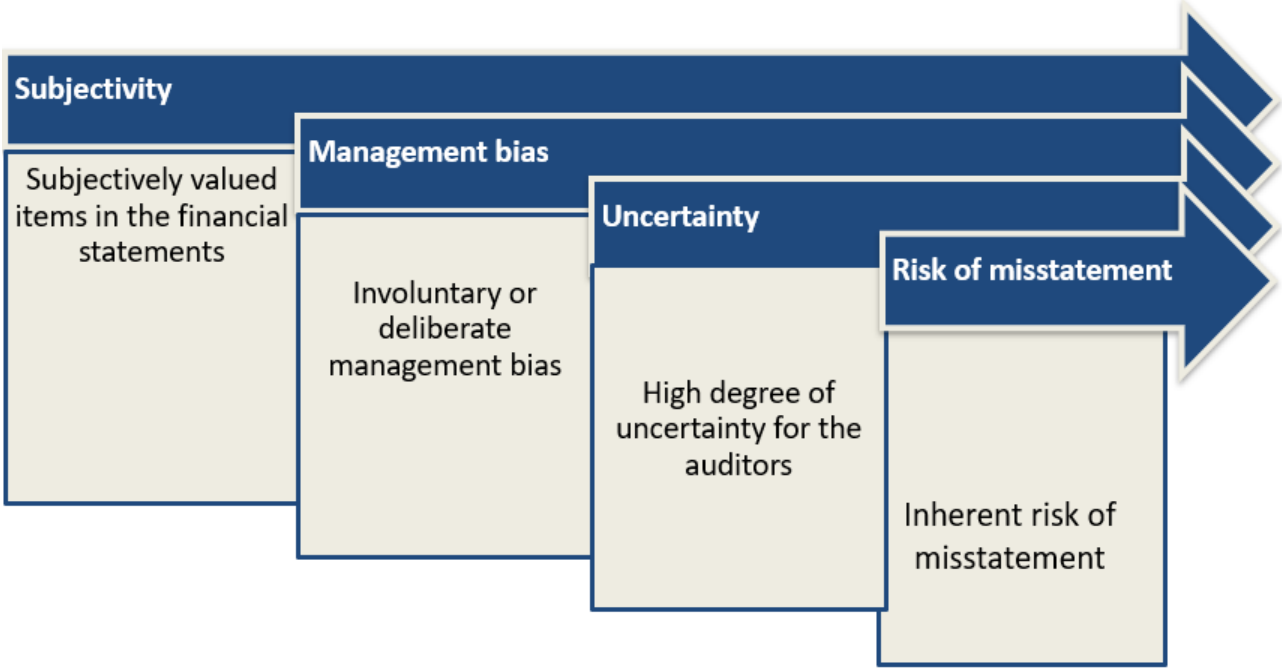


Figure 7. The accounting estimates and the audit process challenges

As previously mentioned, in this chapter we want to review the academic literature related to the audit of accounting estimates and FV measurements and the associated risks. Sometimes, 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 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.

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

In order to identify current trends on auditing FV measurement and other estimates and considering also 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.

After this investigation, where we considered all the possibilities of research for our topic of interest (the audit risks related to accounting estimates, including risks related to the audit of FV

measurements) we matched the results to see exactly how many different articles we have. In Table 2.1 we present the number of articles resulting from each database.

Table 2. 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 2.1, 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. We mention that some of the excluded articles were still kept in a separate database, as they were relevant for our work from the next chapters.

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 8, 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.

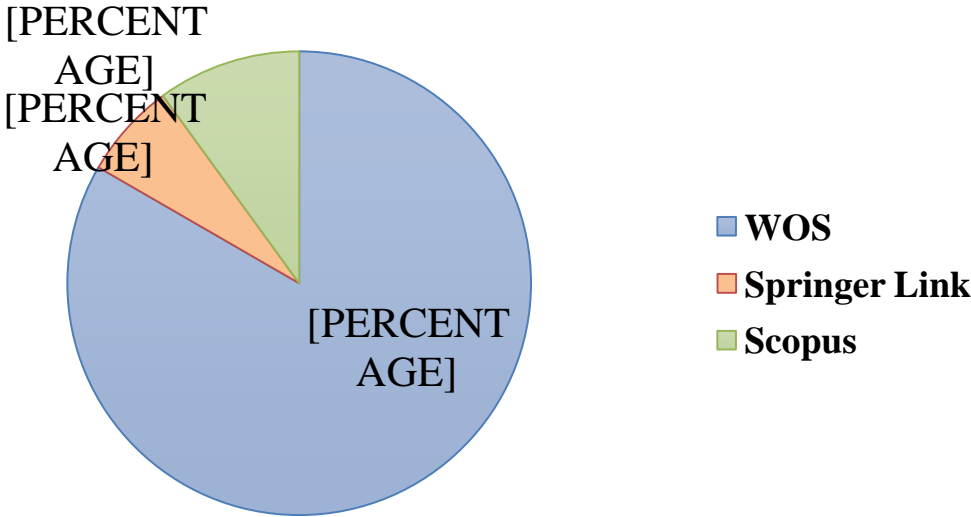


Figure 8. The sample of articles in the databases

Figure 9 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.

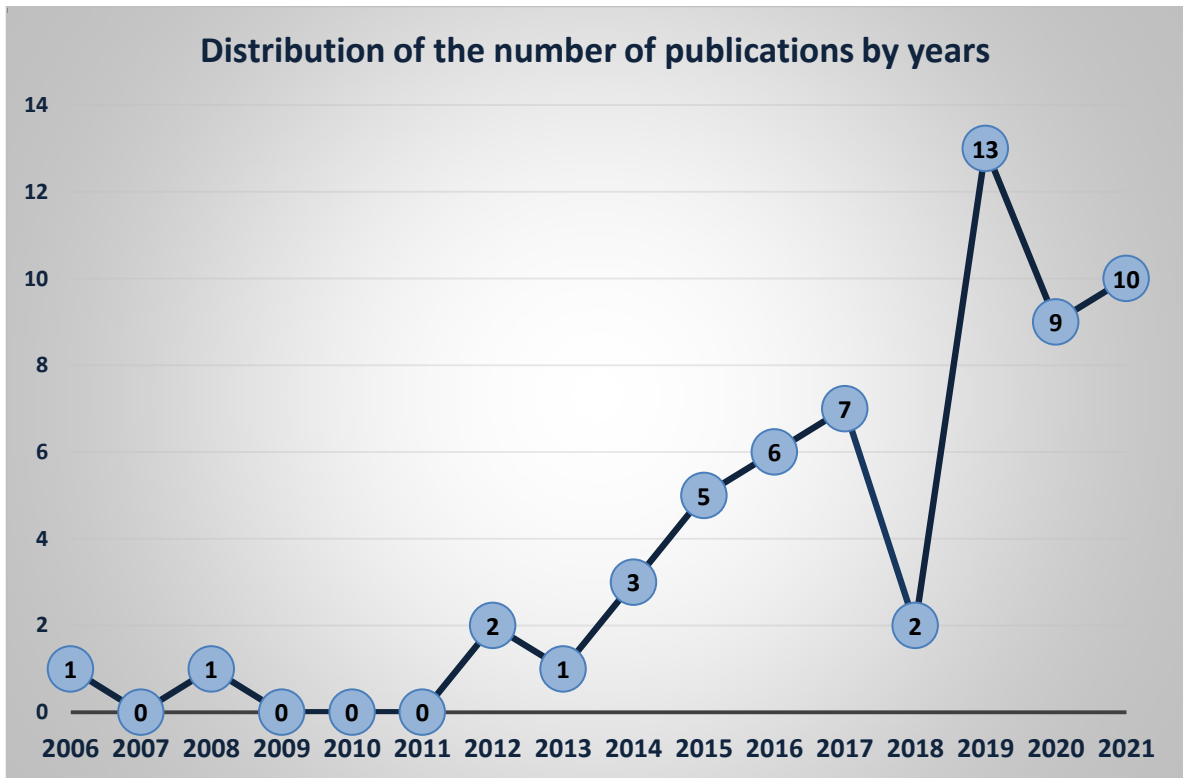


Figure 9. Number of publications by year

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 10 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%.

compared with the first place. Moreover, we note that generally, the relevance and the prestige of the analysed journals are related to the number of academic studies included in our examination.

Table 2. 2 Journal ranking on H index and SJR

No.	JOURNAL	H index	SJR	No. articles/journal
1	Accounting review	156	5.68	10
2	Journal of accounting research	141	6.77	5
3	Accounting organizations and society	133	2.62	8
4	Contemporary accounting research	99	2.77	7
5	Business horizons	87	2.17	1
6	Auditing-a journal of practice & theory	78	1.91	8
7	Accounting horizons	74	1.3	1
8	Review of accounting studies	74	4.42	3
9	Journal of accounting auditing and finance	51	0.62	2
10	Review of quantitative finance and accounting	43	0.66	1
11	Journal of property investment & finance	35	0.37	1
12	Behavioral research in accounting	24	1.31	2
13	Asian review of accounting	22	0.36	1
14	International journal of auditing	21	0.58	2
15	Journal of business economics	21	0.74	1
16	Journal of emerging technologies in accounting	14	0.76	1
17	International journal of economics and business administration	13	0.29	1
18	Asian journal of business and accounting	12	0.19	1
19	Journal of financial reporting and accounting	7	0.29	1
20	Studies in business and economics	3	0.13	1
21	Journal of corporate accounting and finance	-	-	2
TOTAL				60

Therefore, we can conclude that our sample of 60 articles comply with the requirements related to the relevance of an article or the relevance of a journal, as we saw in the H index analysis. Furthermore, the first 3 journals in the top above are also in the top 15 Scimago - Journal Rankings on Accounting (Accounting review-6; Journal of accounting research-4; Accounting organizations and society-12). 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 our 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 will have

at our disposal. That is why we consider important this quantitative analysis, whose conclusions help us to better design and justify our research.

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

The audit of accounting estimates, FV measurements, and the associated risks, is a challenging subject, as already pointed out by regulatory bodies and researchers. We saw the interest for this issue in the quantitative analysis from the previous subchapter. 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. We will see that they 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.

Audit of accounting estimates - the process, the risks, the challenges, the consequences

In an attempt to establish directions for reviewing the literature, we created Figure 11, where 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.

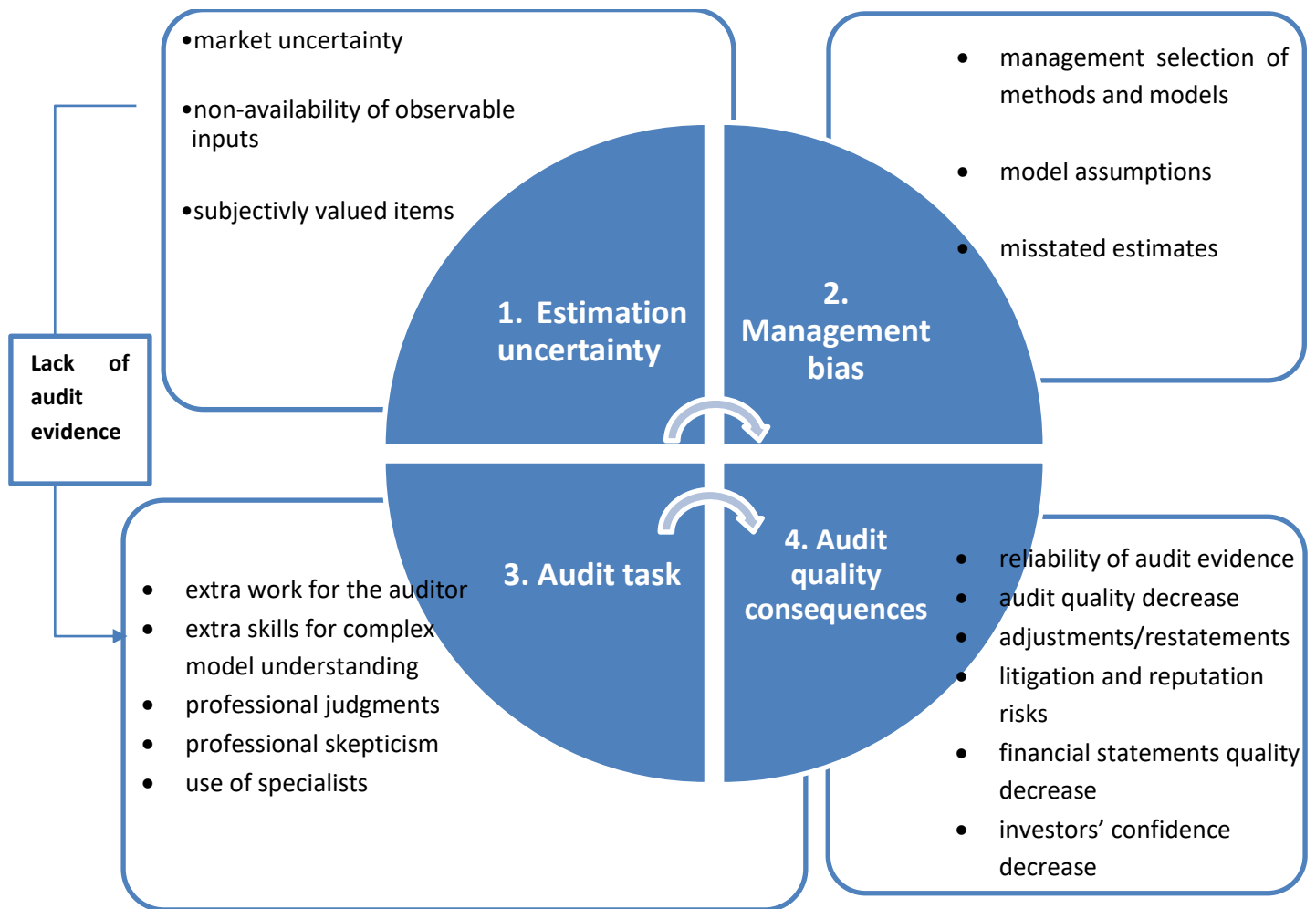


Figure 11. Audit of accounting estimates - the process, the risks, the challenges, the consequences

As it can be seen, 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.

As for any research work, the review of the state of knowledge is an important stage, so we will make an inventory of ideas addressed previously in the literature. Therefore, we will see further, 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.

Before presenting in more detail the current status of the literature on the 4 topics mentioned previously, we will present a set of articles identified during our analysis intended to generally emphasize the challenges of auditing accounting estimates, as identified by recent research. We designed this section - 2.2.1 with the aim of making an introduction and a transition to the 4 points of interest revealed in Figure 11.

2.2.1 Accounting estimates and fair value measurement- the challenges

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). In Table 2.3 we made a synthesis of these issues as presented in the IFIAR's 2021 report, on six specific inspection themes.

We can notice that a large number of findings are related to the reasonableness of assumptions. The inspection findings of PCAOB and IFIAR are consistent with the results of recent research (Cannon & Bedard, 2017; Glover et al. 2017). This indicates issues from the beginning of the FV measurement audit process. The auditors are asked to examine carefully the fair value and other estimates and the reasonableness of assumptions, before trusting and forming an opinion. On the other hand, the failure to sufficiently test the accuracy of the data and the management bias are two other widespread challenges for audits related to accounting estimates and FV measurement,

as noted in the Oyewo et al. (2020) investigation. As may be seen, the audit inspectors provide consistent information on these inspection theme findings. Nonetheless, it may be noted that even if the auditors have to face the same challenges, however, there is a decrease in the audit inspection findings related to the estimates and FV measurement, in the last three years. In any case, the audit of FV measurement and accounting estimates is yet a subject matter to be investigated (Bratten et al. 2013; Brink et al. 2016; Cannon & Bedard, 2017; Glover et al. 2017).

Table 2. 3 Table3. 1Audit inspection findings

Accounting estimates, including FV measurement	Number of findings				
	2020	2019	2018	2017	2016
Reasonableness of assumptions - When testing an accounting estimate, failure to assess the reasonableness of assumptions including consideration of contrary or inconsistent evidence where applicable	102	115	131	128	117
Failure to sufficiently test the accuracy of the data	34	34	45	45	25
Failure to perform sufficient risk assessment procedures	28	24	38	25	38
Failure to adequately consider indicators of bias	11	16	4	11	5
Failure to take relevant variables into account	6	8	17	19	17
Failure to evaluate how management considered alternative assumptions	4	10	12	13	8

Source: IFIAR, 2021; <https://www.ifiar.org/?wpdmdl=12436>

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.

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, as presented in the framework in Figure 8. Next, we will take the 4 topics listed above in order to see the current status in the literature.

2.2.2 Estimation uncertainty

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*.

The most 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 that we will also address in a future chapter of this work.

2.2.3 Management bias and estimates’ imprecision

Another conflict related to estimates, which arises out of their characteristic uncertainty and imprecision, is management bias. The deliberate (or not necessarily deliberate) distortion of the estimates impacts the amount of work for the auditors, the audit quality, the financial statements quality, the investors’ perception, or it has even litigation and reputation consequences. Another recent paper (Landuyt, 2021) investigates how an imbalanced emphasis on management bias decreases the auditors’ attention on the imprecision inherent risk of the estimates. The author

integrates into the same study the management bias and the imprecision as accounting estimate risks. The experiment reveals that there is a risk that the imprecision of measurement specific to accounting estimates will be neglected by the auditor if too much emphasis is placed on management bias. In the same manner, if the management bias is smaller than the imprecision of measurement and the auditor emphasizes both risks, this mitigates the auditor's tendency to reduce the effort he should make.

We reiterate the common effort that normalizers have made in the last years to reduce bias, but especially to make auditors aware of it. It seems that this effort and the release of the new updates for the audit standards (as regards the estimates, management bias, and risk assessment requirements) lead to a decline in managers' tendency to exceed analysts' expectations through income-increasing bias in estimates (Seidel et al., 2020). Anyway, the same author found that the firms that used to bias multiple accounting estimates to beat analysts' expectations, choose to use bias in smaller amounts across more individual estimates after the standard improvements. Therefore, there will always be alternatives where there is less scrutiny from the auditors that managers will take advantage of. That is why we strongly agree with researchers (Christensen et al., 2012; Bratten et al., 2013; Abernathy et al., 2015) who put a lot of emphasis on the need for more indicators for bias management.

2.2.4 Audit task challenges

The professional skepticism/critical thinking, the use of a valuation specialist

One of the researches that come with an answer to the disputes on the audit of complex estimates is that of Griffith et al. (2015b). The authors started from the idea that an improvement of the audit quality should rather rely on critical thinking, than on more doubts or more evidence. Through their experiment, they demonstrate that a deliberative mindset, which involves critical thinking, improves the audit of accounting estimates. Specifically, Griffith et al. (2015b) study shows that auditors with a deliberative mindset are more likely to identify biased estimates and to use evidence from extra sources that assist them in identifying inconsistencies at the level of estimates.

Another solution for the auditors, to help them face the complexity and uncertainty of estimates is the use of valuation specialists. Though, the use of external specialists has its own challenges, as documented by Griffith (2020) and Griffith & Hammersley (2021). According to prior studies (Griffith et al., 2015b; Glover et al., 2017), auditors are prone to rely on employed or engaged valuation specialists. This happens in particular when auditors want to reduce risks and

uncertainty related to estimates, including FV (Cannon & Bedard, 2017; Griffith, 2020). This reliance on experts is higher especially for nonfinancial FV measurement, as confirmed in Glover et al. (2017) study. Otherwise, the overreliance on external parties was criticized (IAASB, 2013; PCAOB, 2015), as auditors try to adapt specialists' views to their initial views on estimates (Griffith, 2015; Griffith et al. 2020²).

Through their interviews with auditors and valuation specialists, Griffith & Hammersley (2021) analyze the responsibility of the latter in FV audits and examine if the practitioners will benefit from the amended standards related to the use of specialists (see AS 2110; PCAOB, 2018). Among other aspects, the authors of the cited paper raise the question on transferring responsibility to the specialist, when auditing FV measurement. Following the analysis of auditors' and valuator's practical experiences, the research concludes that given that the standards do not increase specialists' responsibilities, this allows auditors to adjust the external experts' results to their own view (Griffith & Hammersley, 2021). An explanation for the auditors' partial acceptance of specialist's view is that even if their work ensures the ontological security expected by the auditors, the specialists' knowledge is a threat that undermines their professional authority in fair value auditing (Griffith et al. 2020). As far as we can see, the use of valuation specialists by the auditors turns out, from a possible answer to cope with the complexity and uncertainty of estimates, into a challenge.

The use of specialists, as an audit risk mitigation strategy, was documented also by Cannon & Bedard (2017) in their empirical study. Following their comprehensive analysis, the results revealed that in the context of estimation uncertainty, the auditors seek advice from specialists influenced by the level of inherent and control risk. Related to the use of an external specialist by the client, Deaconu et al. (2021b, 2021c) experiment reveals a lower level of audit risk perceived by the auditors, than when the level 3 estimate is made internally, by the management. For the auditors, this lower level of confidence in the estimates made without the intervention of a specialist is consistent with one of the conclusions of Cannon & Bedard (2017) research. They assert that very often, auditors engage a third-party valuation specialist when the client did not have one.

²See Griffith et al. 2020 conclusions: "The resulting one-sided competition fosters incomplete acceptance of specialists' work, as evidenced by auditors *who edit and finalize, delete certain information from, and ignore issues raised in specialists' work*"

2.2.5 Audit quality consequences

Litigation and reputation risks related to estimates

Another risk is the litigation specific to accounting estimates, which prior studies argued as helping to ensure high-quality audits (DeFond & Zhang, 2014). Gimbar & Mercer (2021) states that for effective management of the litigation or reputation consequences, the auditors should make a proper assessment of these risks related to inaccurate accounting estimates. Their experiment showed that auditors have difficulties, overestimating the consequences of inaccurate estimates. In our opinion, their study points out an important risk, instinctively associated with distorted accounting estimates. Given that uncertainty can give rise to inaccurate estimates, the authors investigate if this accounting estimates' specific risk bias the auditors' ability to assess properly the forthcoming risks (litigation or reputation consequences). Therefore, we can notice once again the importance of identifying all sorts of risks specific to accounting estimates, because they can impact the audit mission as well ex-ante and ex-post (e.g. predicting the appropriate level of audit testing).

In order to conclude this section we would like to mention that we are aware that there are still some un-discussed sub-topics. We mention that some of the articles identified in the literature analysis in this chapter will be discussed in the following chapters that we propose. 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, FRQ, litigation risks etc.).

Chapter 3

3. THE CONVERGENCE DEGREE BETWEEN THE AUDITING STANDARDS FOR ACCOUNTING ESTIMATES³

3.1 Research motivation

Accounting estimates and related disclosures represent a challenge both for those who prepare financial statements and to auditors as well. The auditors' objective is to assess whether the accounting estimates in the financial statements are reasonable in the context of the applicable financial reporting framework. Unfortunately, as reported by PCAOB or more recently in a survey directed by AICPA, the audit risks related accounting estimates still challenge the auditors when evaluating management's process for developing estimates (PCAOB, 2016; AICPA; 2021). For this reason, we think it's important to see the extent to which regulators have managed to improve the standards so that they offer more guidance to the auditors. In the same time we are interested in how much the gap between these audit standards has narrowed, in a context of increasing "go global" trend for the companies.

Through this study, we aimed to analyze the evolution of international and American auditing standards on accounting estimates following the recent amendments initiated by the IAASB and PCAOB and to determine the degree of convergence between them. Thus, we want to contribute to the international debate on the accounting estimates and audit risks.

As we argued in the previous chapters, a controversial accounting element both in the literature and among accounting and auditing professionals has been fair value. Why did this controversy arise around the fair value? We believe that it exists for two interrelated reasons: first, due to the economic environment characterized by uncertainties, which induces a certain level of volatility of the data used to measure fair value. The second reason for controversy born around this concept-alternative to historical cost (Deaconu, 2009) is due to the unique characteristics of FV, the concept being susceptible to subjectivism, complexity, and uncertainty. Therefore, an uncertain economic environment will accentuate these characteristics specific to the estimates, this subjectivity being a risk that leaves the door open for the management to manipulate them. As a consequence, the audit of such elements is a burden for the auditors, generating for them an additional audit effort, as well as associated risks, aspects mentioned in the literature we reviewed earlier (Christensen et al. 2012; Bratten et al. 2013) and also notified by regulatory bodies.

³ A version of this chapter was published as: Ciurdas, I. (2020), Measurement of Convergence Degree between International and US Auditing Standards for Accounting Estimates, *Audit Financiar*, 18 (160), pp. 812-820.

In order to keep pace with the rapidly evolving economic and business environment, the standard setters have noticed some necessary changes for the audit of accounting estimates (including FV measurement). They are aware of the nature of estimates, some of them involving complex assessment processes and methods (PCAOB, 2018).

Thus, at the international level, the IAASB launched in August 2017 a draft exposure for ISA 540 (on the audit of accounting estimates) with an effective date for the newly revised standard for audits beginning on or after December 15, 2019 (IAASB, 2017). The main aspects that were submitted to public debate for clarifications refer to the risks of estimates in the context of an increasingly complex business environment, the importance of exercising professional skepticism, but also clarifications on the use of an external expert. These issues were also considered by the PCAOB, which in June 2017 proposed replacing the three existing standards⁴ for auditing estimates with a single one. They took into account the supervisory and verification activities of PCAOB and SEC and the suggestions received from researchers. (PCAOB, 2018). Therefore, for companies subject to US law, the new standard for auditing accounting estimates (AS 2501) will be effective for audits of financial statements for fiscal years ending on or after December 15, 2020.

In this chapter, we aim to evaluate the contribution of the new standards ISA 540 and AS 2501 on improving the audit process of estimates (including FV) and to determine the degree of convergence between the two referential. We also analyze the old ISA 540, to observe both the evolution compared to the old standard and a comparison with the amendments proposed by PCAOB in the United States.

The motivation for this study is related to the significant impact of these estimates on the financial statements and, accordingly the auditors' mission. We considered it important to analyze the main changes for the auditing standards of estimates and, at the same time to observe the degree of convergence between them since we are talking about more and more complex elements. We address first auditors, whose work is influenced by the rapidly changing economic environment. They need to be aware of the evolution of these standards and the impact these changes might have on them and their customers. Since in Romania, the applied audit standards are those issued by the IAASB, we considered that this analysis would be interesting for Romanian auditors, who must align with international trends. Moreover, the global evolution of

⁴ AS 2501, AS 2502 și AS 2503

the economic context and, in particular, the development of accounting and auditing practices at the level of estimates (including FV) have an impact also on national audit practices.

The importance of analyzing ISA standards is justified by the large adoption rate of ISA at the global level. According to a recent report issued by IFAC, the adoption rate of ISA is 67% for countries that have completely adopted the international standard, and 29% for those having partially adopted it (IFAC, 2019). Romania is part of the group of countries that have fully adopted both ISA and IFRS, but as we have seen ISAs are of interest for a wider range of contexts. The relevance of the comparison between the American and the International norms is consistent with the effort of PCAOB to converge U.S. GAAS with ISAs, according to AICPA's Auditing Standards Board and their strategic plan (PCAOB; 2019). ASB makes continuous efforts to converge with IAASB, a recent example being the changing in audit reports to converge with international audit standards, along with the recently issued SAS 134⁵ (AICPA; 2019). The revision of ISA 540 and AS 2501 is another example for this on-going trend of converging auditing standards. Moreover, it should be mentioned that the convergence is not limited to audit standards, but is also considered for financial reporting standards. According to the same IFAC report the percentage of countries having totally or partially adopted IFRS is around 91% (IFAC, 2019).

The empirical part of this chapter is based on a content analysis of the auditing standards specific to accounting estimates, using three similarity and one dissimilarity coefficients for measuring the level of convergence. The rest of the chapter is structured as follows: first part - review of the literature and correlation of this analysis with the content of standards and working documents; the second part - research methodology and details on the statistically processed database, the third part - the results of the statistical analysis, and the last part the conclusions of the study.

3.2 Analysis of the literature and audit standards specific to accounting estimates

As we mentioned above, one of the most important challenges for the auditors is when they have to audit complex accounting estimates (Griffith et al. 2015b; Glover et al. 2017). Given the fact that auditors must find a way to mitigate the risks and complexities associated with estimates (including FV), we identified several previous studies that have contributed to the audit risks related to accounting estimates. At the same time, we considered as an analysis topic in our research the external sources of information (management or auditor specialists), this being one

⁵ "SAS 134- Auditor Reporting and Amendments, including Amendments Addressing Disclosures in the Audit of Financial Statements"

of the clarifications brought by IAASB and PCAOB in the process of updating audit standards on accounting estimates. The results and concerns raised by some of these previous researches determined the regulatory bodies to review specific standards.

We would like to emphasize that in Chapter 2 we have already discussed some of these aspects in more detail. Further, we just resume the core and add some nuances useful for this study.

3.2.1 Risk factors for the estimates

The lack of objective data influences the level of uncertainty for some elements of accounting, and the company's management can take advantage of this risk specific to the estimates. This complicates the process of reducing the audit risk and influences the level of materiality (Christensen et al. 2012). Under such circumstances, the burden for the auditors increases, and that is why researchers (Christensen et al. 2012, Abernathy et al. 2015) suggest potential revision for the audit standards to clarify the auditor's responsibilities for significant estimates that contain extreme measurement uncertainty.

ISA 540 states that the uncertainty of the estimate arises when "the monetary value required for an item in the financial statements cannot be accurately determined, and the result of the estimate is not known before the date of completion of the financial statements." Bratten et al. (2013), considers uncertainty as one of the most important features of estimates, contributing significantly to its complexity. This complexity derives from the nature of the concept, as opposed to the verifiability and objectivity specific to the historical cost.

Many authors have suggested that besides uncertainty, the complexity of estimation and the subjectivity of the manager are the main risk factors for estimates (including FV) with an impact on the audit process (Martin et al. 2006; Christensen et al. 2012; Bratten et al. 2013; Griffin, 2014; Brink et al. 2016). However, the previous ISA 540 focused mainly on estimation uncertainty. Still, it has evolved, and the revised ISA 540 admits that there may be other risk factors in addition to estimation uncertainty, such as the complexity and subjectivity of management, already mentioned in the literature. For example, the research of Griffin (2014) provides empirical evidence about how auditors make decisions related to FV measurement uncertainty. He provides evidence that auditors are most likely to require clients to adjust FV estimates when subjectivity and imprecision are both high. In some research (Glover et al. 2017; Cannon & Bedard, 2017), the authors report that auditors may face situations where the level of uncertainty of estimates is more important than the materiality, which makes it difficult to audit

such elements. We will see that these risk factors analyzed in previous research were also taken into account when revising the standards (ISA 540 and AS 2501).

3.2.2 The use of an external expert

As mentioned previously, another concern of the regulatory bodies was to clarify the audit of the estimates obtained using external experts. This is the second analysis topic that we wanted to study in our paper, in terms of evolution and convergence between the two standards.

There are studies asserting that the reliability of FV estimate increases for the investors when using the services of an external evaluator (Muller & Riedl, 2002; Bratten et al. 2013). This was also confirmed by the PCAOB and IAASB audit regulators, but also by the BIG 4 studies (Deloitte, 2010).

Following the revision of ISA 540, the IAASB has decided to propose amendments to ISA 500 - *Audit Evidence*; IFAC and IAASB being aware that a revision of this standard was needed to keep pace with the increasing complexity of the data and models used in the case of accounting estimates (IAASB, 2017). Also, paragraphs A126 to A129 of the ISA 500 standard were included in the new revised ISA 540, which the IAASB considered to be specific to accounting estimates (IAASB, 2018b). At the same time, the revised ISA 540 differentiates between the expert (individual or organization) who has expertise in a different area of accounting or audit and the external source of information that provides public information necessary for the company to establish the estimate (IAASB, 2017). The same happened in the USA, PCAOB considered that a revision of the AS 1105 *Audit Evidence* standard was required.

3.2.3 Amendments of auditing standards - ISA 540 and AS 2501

At the international level, IAASB launched the exposure draft for ISA 540 in 2017 because they wanted to provide more detailed guidance to auditors, to increase the quality of audit engagements and to emphasize the importance of applying professional skepticism when auditing accounting estimates. The new standard is effective from December 2019. These matters of public interest on which both the PCAOB and IAASB focused are issues on which previous research has warned, requiring additional guidance to minimize the audit risk related to estimation uncertainty (Glover et al. 2016; Abernathy et al. 2015). In US data results of annual inspections of audit firms⁶ carried out during 2008-2016, showed that a significant percentage of the total audit deficiencies are related to the process of auditing accounting estimates and fair

⁶ BDO USA, LLP; Crowe Horwath LLP; Deloitte & Touche LLP; Ernst & Young LLP; Grant Thornton LLP; KPMG LLP; PricewaterhouseCoopers, LLP; RSM US LLP

value (PCAOB, 2016). These inspections identified cases where auditors did not fully understand how the estimates were made or did not sufficiently test the significant inputs used by the management. These deficiencies occurred in the audit process of accounting estimates and FV, are also reported in studies published by IFIAR - International Forum of Independent Audit Regulators (IFIAR, 2018; IFIAR, 2019).

Thus, in June 2017 PCAOB proposed to replace the three standards AS 2501 *Auditing Accounting Estimates*, AS 2502 *Auditing Fair Value Measurements and Disclosures* and AS 2503 *Auditing Derivative Instruments, Hedging Activities, and Investments in Securities* with a single standard AS 2501 revised, which includes all the three elements mentioned previously. The main objective was to strengthen and increase the requirements for the audit of accounting estimates and fair value, by replacing the three existing standards with a single standard that establishes a uniform risk-based approach (SEC, 2019).

In the next section, we will see which elements are selected and analyzed from the topics discussed above, as a result of the amendments made by PCAOB and IAASB.

3.3 Research methodology

The database and the statistical approach

The objective of our study is to analyze the changes and to measure the degree of convergence between the auditing standards – ISA 540 and AS 2501. We chose the two referential because they both include in a single standard all accounting estimates, including fair value. Moreover, we are interested in these two contexts, as the American standards setters engaged in a convergence plan with the International Audit Standards (AICPA; 2019).

Therefore, at the international level, we have analyzed ISA 540 *Auditing accounting estimates, including fair value accounting estimates and related disclosures*, and the new ISA 540 (Revised) *Auditing accounting estimates and related disclosures*. In addition to the actual standard, we used other documents: the exposure draft, the basis for conclusions of IAASB, but also the synthesis issued by the IAASB in October 2018, together with the final decision. Some items required the documentation of other standards (as ISA 500 *Audit Evidence*) because the revision of ISA 540 needed some changes at the level of other different standards. Therefore, some information is the result of the content analysis of ISA 500, which is closely related to one of the topics we analyzed - the use of external sources of information.

The analyzed American standard was the new revised AS 2501 *Auditing Accounting Estimates, Including Fair Value Measurements*. As in the case of the international standards, we also used

additional information provided by the equivalent of ISA 500 for the American context - AS 1105.

We made a content analysis of the three referentials (ISA 540, ISA 540 – Revised and AS 2501) in order to identify and to measure the elements mentioned in the previous section. Following the selection of the analyzed elements (see Appendix 1) within each theme (ex: risk factors assumed by IAASB / PCAOB) we checked the three standards, obtaining binary variables, as follows: if the element analyzed was mentioned in the standards the variable received the value 1, if there were no mentions or that analyzed element is not applied, the variable received the value 0. These are dummy variables, according to statistical data processing techniques. To determine the level of convergence between International Standards (ISA) and American Standards (US GAAS), we performed an empirical analysis based on similarity and dissimilarity coefficients (Fontes et al. 2005; Bonaci et al. 2009). Taking into account our database with binary variables, as well as previous studies in the literature (Deaconu & Buiga, 2010), we used as similarity coefficients; Simple Matching (1958), Rogers & Tanimoto (1960); Sokal & Sneath (1963) and for dissimilarity the Euclidean Distance.

3.4 Results and discussion

3.4.1 Global convergence degree analysis

In Table 3.1 we presented the results of the general analysis on the convergence level between international and American standards, taking into account all the variables listed in Appendix 1. This allowed us to establish a hierarchy regarding the level of convergence. Thus, the most important degree of convergence is between the two revised references ISA 540 and AS 2501 (ISA540_R / AS2501_R); followed by the old ISA 540 with AS 2501 (ISA540_V / AS2501_R), respectively the old ISA 540 with the new ISA 540 (ISA540_V / ISA540_R). The results for all three coefficients of similarity confirm the robustness of the results.

Table 3. 1 Global comparative analysis results

Coefficient	ISA540_V/ISA540_R	ISA540_R/AS2501_R	ISA540_V/AS2501_R
Simple Matching ^a	0.333	0.571	0.476
Rogers&Tanimoto ^a	0.200	0.400	0.313
Sokal&Sneath 1 ^a	0.500	0.727	0.645
Euclidean distance ^b	3.742	3.000	3.317
Degree of convergence rank	III	I	II

a- similarity coefficient, b- dissimilarity coefficient

Source: own projection based on processed data

We can observe that the review of the two audit frameworks (international and American) has led to an increase in the degree of similarity between them, confirming the attempts and efforts of the regulatory bodies to align the standards. The highest Euclidean distance level for the old ISA 540 / revised ISA 540 (3.742) can be interpreted as a success of the IAASB in improving the old standard.

3.4.2 The degree of convergence analysis for the analyzed topics

In Table 3.2 we chose to divide the analyzed elements into three sections. In section A (an introductory section) we considered 3 variables (see Appendix 1) through which to analyze some key general aspects regarding estimates and fair value. Taking into account the elements examined here, we observe from the results presented in Table 3.2 that there is a perfect similarity between the old ISA and the revised AS 2501. For all three cases, we have a unique standard regarding the audit of estimates (including fair value), not being the case before the revision of the American referential, which had three different standards. Instead, we have a lower level of similarity (<0.500) for the cases ISA540_V / ISA540_R and ISA540_R / AS2501_R. This is justified by two important differences: the fact that the IAASB waived the fair value term of the title and the separate section on fair value within the standard. Instead, PCAOB chose to include the FV term in the title of the new AS 2501 and to dedicate a separate appendix to it.

Table 3. 2 Comparison analysis results by discussion themes

Section A. General aspects and fair value			
Coefficient	ISA540_V/ISA540_R	ISA540_R/AS2501_R	ISA540_V/AS2501_R
Simple Matching ^a	0.333	0.333	1.000
Rogers&Tanimoto ^a	0.200	0.200	1.000
Sokal&Sneath 1 ^a	0.500	0.500	1.000
Euclidean distance ^b	1.414	1.414	0.000
Degree of convergence rank	II	II	I

a- similarity coefficient
 b- dissimilarity coefficient

Section B. Risks of estimates reported by the standards and risk approaches

Coefficient	ISA540_V/ISA540_R	ISA540_R/AS2501_R	ISA540_V/AS25501_R
Coef. Simple Matching ^a	0.333	0.667	0.444

Coef.Rogers&Tanimoto ^a	0.200	0.500	0.286
Coef. Sokal&Sneath 1 ^a	0.500	0.800	0.615
Euclidean distance ^b	2.449	1.732	2.236
Degree of convergence rank	III	I	II

a- similarity coefficient
b- dissimilarity coefficient

Section C. Use of experts and use of external sources of information

Coefficient	ISA540_V/ISA540_R	ISA540_R/AS2501_R	ISA540_V/AS25501_R
Coef. Simple Matching ^a	0.333	0.556	0.333
Coef.Rogers&Tanimoto ^a	0.200	0.385	0.200
Coef. Sokal&Sneath 1 ^a	0.500	0.714	0.500
Euclidean distance ^b	2.449	2.000	2.449
Degree of convergence rank	II	I	II

a- similarity coefficient
b- dissimilarity coefficient

Source: own projection based on processed data

Further on, in terms of specific audit risks for the estimates notified by the standards (Table 3.2-section B) we have the highest degree of similarity for the comparison between ISA and AS revised, the highest value (0.800) being obtained for the Sokal & Sneath coefficient. Thus, it appears that regulatory bodies converged toward the same specific audit risks approach. The proof is the introduction of the complexity and subjectivity as inherent risk factors specific to the estimates for both referential and the emphasis on the need to exercise professional skepticism. We believe that this similarity (ISA540_R / AS2501_R) should be seen by auditors and other stakeholders as a response of regulators to increase the quality of the audit, the existence of a more uniform approach for risks and last but not least the increasing degree of convergence between standards.

In contrast, the comparison of the old ISA 540 and the revised ISA 540 confirms the lower degree of similarity between them, with lower values of similarity coefficients (0.333, 0.200, 0.500) as in the case of the global analysis. The introduction of complexity and subjectivity as inherent risk factors specific to accounting estimates or the separate assessment of inherent and control risk for estimates are elements that justify the evolution of the new standard to the old one and the lower degree of similarity between them.

Table 3.2, Section C (Use of Experts and External Sources of Information) confirms the high similarity between the new ISA 540 and AS 2501, as well as for the global analysis and that of Section B, with high values for the three coefficients. The elements analyzed in the third topic, as well as the results of the similarity coefficients, demonstrate the interest of the regulators to align the American standards with the international ones. This is mentioned even by the PCAOB, which considered the draft of ISA 540 for the development of the new AS 2501 and continuously mentioned the comparison with the international audit framework in the working documents (PCAOB, 2018).

Therefore, we noted that the revised new standards aim to assist auditors with more details and additional guidance on addressing the risks specific to estimates, professional skepticism, and the impact of using an external source for auditors. The consequence of these changes, which both regulatory bodies have taken into account, is a reduced audit risk and effort for the auditors when verifying accounting estimates (including fair value). These effects will result in higher quality audit missions, a very important objective for auditors in Romania or other emerging countries, because for countries where the audit profession is more developed, the quality of the audit mission is also higher (Michas, 2011).

We consider the analysis we have carried out interesting for Romania as well, first of all due to the fact that Romania is part, as well as other emerging countries in the category of states where international auditing standards are applied. Another reason why we considered this analysis to be interesting for Romanian auditors is related to the lower level of experience of professionals in our country in relation to auditing the fair value and other estimates, requiring guidance and documentation of this subject. Therefore, global evolution has an impact on national audit practices as well. Thus, the auditing trends at the international level are also reflected in the profession of Romanian auditors that apply these standards. Increasing convergence level between the two referential that we analyzed denotes the joint effort of the regulatory bodies to have a coherent set of standards.

3.5 Conclusions of the study

Through this analysis we aimed to evaluate the contribution of the new standards ISA 540 and AS 2501 on improving the audit process of estimates (including FV) and to determine the degree of convergence between the two referential. The results obtained in the previous subchapters allow us to draw some conclusions about the objectives we have set. The main changes made by the IAASB and PCAOB aimed to provide more detailed guidance about the audit of estimates, in order to increase the quality of the audit engagement and to keep pace with changes that

implicitly affect accounting estimates and the audit process. We chose to make this comparison with the American reference AS 2501 because both include all accounting estimates, including fair value, both started a review process in close periods, and the PCAOB closely follows the international trend. Moreover, we were motivated in our choice by the AICPA's Auditing Standards Board decision to improve convergence within audit standards (American vs. International). Given the large number of countries having adopted ISAs (IFAC; 2019) we were interested on the degree of convergence of auditing accounting estimates related standards, as they are supposed to follow the same path of increased alignment with the international setting.

Through this study, we address primarily auditors, but also other stakeholders as trends and the development of the economic environment influence the progress of standards and audit practices, also having an impact on national practices.

The statistical results show that changes to the analyzed auditing standards at international and American level are convergent, the comparison between the revised ISA 540 and the revised AS 2501 obtaining the highest level of similarity. Therefore, the IAASB and PCAOB's attempt to reduce audit risks and auditors' efforts on estimates is materializing. Besides, the degree of similarity between them proves the effort of the regulatory bodies to create a set of coherent and convergent standards, even if we do not have a perfect level of similarity.

Through this statistical analysis we also demonstrated the improvement of the new ISA 540 compared to the old ISA 540, as evidenced by the coefficients with the lowest degree of similarity for all four cases presented above.

One consequence of these amendments of the standards is the introduction of complexity and subjectivity of management as inherent risk factors, the emphasis on professional skepticism, the focus of auditors on estimates with a higher risk of material misstatement, and clarifications on the use of external/internal sources of information. However, some elements differentiate the two references, such as the use of different terms for external sources of information, for the person assisting the management in making accounting estimates, or different approaches for fair value.

So, all these elements that we considered when analyzing the evolution of the two referential provided us with an insight into the degree of convergence, useful for the auditors, standard-setting bodies, audited companies, or management. Even if, after analyzing the results, we could notice an improvement of ISA 540 compared to the old standard and an increase in the level of convergence with AS 2501, we are aware that there is still room for improvement for these two audit standards.

Among the limitations of our study we have identified at the level of this research is the analysis conducted only at the level of the main aspects and amendments regarding the audit of accounting estimates. We did not analyze the convergence of the three standards as a whole. Therefore, a comprehensive examination, considering all aspects set out in the standards for auditing estimates, or the use of additional coefficients to measure the convergence between the two referential may represent future directions for improving the research.

Chapter 4

4. FAIR VALUE MEASUREMENT AND THE AUDIT RISK. EMPIRICAL EVIDENCE FOR AN EMERGENT CONTEXT⁷

4.1 Research motivation

This paper focuses on the auditor's diligences in verifying the accounting estimates and on FV as the most controversial estimate. In short, auditors apply specific tests on the FV measurement provided by companies' managers, implying the assessment of management assumptions on the subject, assumptions' reliability, valuation approaches (methods), and specific inputs used. An appropriate conducted audit process is (one of) a guarantee for financial reporting quality (FRQ hereinafter) (Beneish et al., 2012; Zang, 2012; Bolivar & Galera, 2012).

From accounting estimates, FV measurement is defined as a unique task due to the necessary recourse to the market data, with greater difficulties when such external information are not immediately available. To measure FV, management must use an adequate approach and appropriate assumptions that have the potential to reflect the actions of individuals in the market (Menelaides et al., 2003). Griffin (2014) also highlights about the FV setting that it is special and that the literature on the subjectivism as a source of uncertainty, for example, is not necessarily applicable to this concept. The unicity of such an approach is also explained by the increasing requirements of accounting standards for FV use (Christensen et al., 2012), the complexity of some measurements (e.g. the prescriptions of IFRS 9 Financial instruments which increases the valuation risk) and their impact on financial statements. It is therefore critical for the FV audit that such aspects are investigated. In the last years literature abounds in descriptions and signals of the risks associated with the construction and audit of the estimates. Examples of research subjects are the valuation inherent risks (e.g. Zack et al., 2009), the management opportunism which sometimes is associated with creative accounting techniques, mainly related to earning management (e.g. Beneish et al., 2012; Zang, 2012), or, generally, estimation uncertainty and implication for audit (e.g. Christensen et al., 2012; Bratten et al., 2013). Nevertheless, there is still room for additional research on audit and estimates (Bratten et al., 2013; Ettredge et al., 2014). Our research intends to make a contribution to this debate, specifically related to the risks induced by FV estimation for the audit mission.

⁷ Versions of this chapter were published as:

- Deaconu, A., Ciurdaș, I., & Bonaci, C. (2021b). Challenges Faced By Auditors When Estimating Fair Values. An Experiment in an Emerging Economy. *Studia Universitatis Babeș-Bolyai*, 66(1), pp. 36-60
- Deaconu, A., Ciurdaș, I., & Bonaci, C. G. (2021c). Complexitatea valorii juste și riscul de audit. *Audit Financiar*, 19(161)

Given that standards did not always provide enough guidance in order to minimize the audit risk related to the uncertainty of estimates, the standard setters are invited by the researchers to intervene in this respect, improving the existing standards. As a response, the audit standard setters are now preoccupied to strengthen requirements for audit accounting estimates, including FV. They are aware of the nature of estimates, subjective and susceptible to management bias. We are interested in IAASB actions, also because our case study is built on the Romanian setting, where International Auditing Standards (ISA) are applied. As such, in August 2017, IAASB launched an Exposure Draft on a proposed major revision of ISA 540 *Auditing accounting estimates and related disclosures*, aiming to enhance requirements for risk assessment procedures and the auditor's work effort in responding to the assessed risks of material misstatement (IAASB, 2017).

It can be observed an interest of IAASB on the use of 'external information sources' which is equivalent to the use of the work of specialists, including valuers. This is a specific requirement, a complement to the other ones concerning the audit of accounting estimates, aiming to amend the existing auditing standard ISA 540 (IAASB, 2017). The intention is to strengthen the requirements for the auditor to evaluate as well the work of management's and auditor's expert (for the auditor's expert is about the employed and auditor-engaged specialist), including establishing a risk-based approach in such cases. We are interested on the first case, the management's expert, as we will document further.

The present research intends to reveal the influencing factors on FV audit, and analyses, for the Romanian setting, one of these factors, namely the valuation process conducted to estimate fair value, and in particular fair value estimate provider, as the management's expert. The fair value estimate provider, usually an expert in valuation, as influential factor of the audit process (and related risks), is interesting to study as, according to Martin et al. (2006), there is not enough research on how the auditors use the services of experts, including the management's ones. This must be correlated with the auditors' tendency to significantly rely on external valuation experts work confirmed by Cannon & Bedard (2017) or Glover et al. (2017), hence drifting the need to further guidance for auditors in their work with valuers.

This aim seems of special interest worldwide due to the risks associated with the audit of estimates in general, and FV in particular; to the audit standards ambiguity, not yet updated; to still insufficient milestones provided by the literature; and to some auditing contexts characterized by economic incertitude and internationalization pressures. The Romanian case, an emerging context, could be interesting to explore because it exacerbate some of the FV audit

risks, in principal because the concept and its implementation are relatively new. The ISA and IFRS requiring FV use is mandatory in the last 10 years, reason for which the auditors' expertise in fair value issues is relatively new.

The remainder of this study is organized as follows: Section 2 synthesizes the relevant literature on the influential factors in the process of auditing estimates, with a focus on FV estimations and FV provider; Section 3 develops the research framework for one of the influential factors, the fair value estimate provider, which we extend to all the coordinates of the valuation process conducted to estimate the FV (*i.e.* FV provider, FV measurement and FV disclosure); Section 4 describes the application of the experiment method to a group of auditors, members of the Romanian audit professional body, the Chamber of Financial Auditors (CAFR); Section 5 provides insides of the Romanian auditing profession regarding the fair value source of estimation, the motivation and the linkage with the environmental and task-related influential factors of FV estimate, such as complexity, uncertainty, managerial bias and standards guidance; the final section provides the concluding remarks.

4.2 Analysis of the literature and hypothesis development

Before going further, we would like to mention that the literature analysis below is linked to chapter 2 and here it only deepens the items relevant for this particular study. Our goal is to resume only that part of the literature that is relevant in this case and possibly to analyse it from a slightly different perspective and very related to what interests us in particular in this chapter.

Specific literature identified several influential factors for accounting estimations' audit, those often cited, transposed here with our own words and after our selection, being 'Fair value complexity' (1), 'Estimation uncertainty' (2), 'Managerial bias' (3), 'Professional skepticism' (4), 'Fair value estimate provider' (5), 'Standards guidance' (6), and 'Auditors understanding on valuation process' (7) (e.g. Bratten et al., 2013 or Doliya & Singh, 2016). Some of the studies also provide some interactions between the factors they propose. Bratten et al. (2013) cover all the factors above as a set of elements judged most relevant to the audit of FV (or other estimates), which are fit within a framework prescribed in earlier literature containing environmental factors (or economic volatility) (factors 2, 5 and 6, above), factors related to the auditor task complexity (synonymous with measurement complexity) (factors 1 and 3, above), and factors related to the individual behavior of auditors (auditor-specific factors) (factors 4 and 7, above). We have already discussed aspects related to the framework developed by Bratten et al. 2013 in our first chapter.

According to our aim, we will analyse the auditor-specific factors directly related to fair value estimation and that we believe having the potential to enhance the quality of the audit process and minimize the specific risks. These are 'Fair value estimate provider' and, in subsidiary, 'Auditors understanding on valuation process'. Afterwards, we will correlate them with other influential factors appearing in the researchers' recent frameworks. Between these, it is well established in literature that fair value complexity, estimation uncertainty and managerial bias are the leading characteristics of FV estimation which impact the audit process, so they have benefited from an exhaustive presentation (e.g. Martin et al., 2006; Christensen et al., 2012; Griffin, 2014; Brink et al., 2016; Bratten et al., 2013).

In relation to the *FV complexity (1)*, Bratten et al. (2013) assert about estimations that they represent an unstructured task with complex nature, uncertain realisation, which has not an objective verifiability. Auditors apply a unique approach in the audit process: the assessment of the reasonability of management valuation model and assumptions. ISA 540 mentions that complexity arises when there are multiple valuation attributes and multiple or non-linear relationships between them. The revised standard further state that complexity also exist in relation to the method, when multiple sources of data, assumptions or valuation concepts or techniques need to be used in determining the outputs of the estimation process. In our view, FV complexity reveals in comparison with historical cost, both being accounting values. Or FV is a market value, volatile, subjective as ways of estimation and inputs to construct it, inputs sometimes unobservable by all the interested parties. FV complexity is strongly linked to the estimation uncertainty. Apart the general complexity of FV for assets and liabilities, there are some elements particularly complex, due their nature and/ or unicity which leads to the lack of market comparable, such as intangible assets or some financial instruments.

Estimation uncertainty (2), particularly in relation to FV estimations, affects the auditor behavior (Bratten et al., 2013). In their experimental study, Griffin et al. (2014) measure estimation uncertainty by inputs volatility (due to subjectivism) and outcomes imprecision (the degree of volatility of estimates in the future). ISA 540 mentions that estimation uncertainty arises when the required monetary amount for a financial statement item cannot be determined with precision and the outcome of the estimate is not known before the date the financial statements are finalized. We view estimation uncertainty as the most prominent characteristic of FV, which contributes greatly to its complexity and derives from the nature of the concept, as opposed to the verifiability and objectivity specific to historical cost.

Management judgement and assumptions, mainly in relation to future events, also cause difficulties in FV audit. The concept of *management (managerial) bias (3)* is related to management assumptions which are subjective in nature, as valuation models and inputs selected (Christensen et al., 2012; Bratten et al., 2013; Griffin, 2014; Brink et al., 2016). We believe that the subjectivism inherent to the valuation process per se may stir, in each of its steps, value manipulations, in the case of each of the three consecrated valuation approach i.e. market, income or cost (SEV, 2019). If there are incentives to misstate earnings, management bias equals management opportunism (voluntary or intentional bias, manipulation) (Bratten et al. 2013; Griffin, 2014; Abernathy et al., 2015; Brink et al., 2016), and the gravity of such actions could lead to fraud. In order to adjust management bias effects, Martin et al. (2006) consider that the auditor must have the knowledge on how managers can induce, voluntary or not, misstatements in FV estimation. The same authors agree on the difficulty of such a task due to the lack of complete knowledge about how the information are combined to form management judgement. Management bias is difficult to detect also due to the FV complexity task (Bratten et al., 2013) and estimation uncertainty (Griffin, 2014).

The *professional skepticism (4)*, suggesting a questioning mind and the critical analysis of audit evidence, is also linked to the quality of FV audit process. Martin et al. (2006) refer to a solution to counteract the auditor tendency to find data in order to confirm an assumption instead of data to refute it. In this vein and for the valuation process, the authors discuss about: the way of data collection for the estimation models, *i.e.* external (more reliable according to Brink et al., 2016), or internal sources; assessing the decision and control process conducted for inputs selection as typology, completeness of available and relevant information, salience of the inputs; asking questions for the failure to use or lesser weight associated to some potential inputs; use for his own estimation other valuation models or inputs as the management. Martin et al. (2006) also evoke the ability of the auditor to decide if and how the service of external valuator is needed.

Related to the factor *Standards guidance (6)*, we refer to auditing standards that interfere with FV estimate and audit. ISA, the standards of interest for us, do not offer detailed guidance for auditing specific types of FV estimates (with the exception of derivative instruments, hedging activities and investments in securities), but on understanding management's process to estimate and assessing if this conforms to accounting standards. The technical details should be searched for in professional guides and books. Other aspects can still be improved. Analyzing standards updates, Christensen et al., (2012) characterize it as insufficient changes in the financial statements format in order to better disclose the estimation risk.

If we further develop our main influential factor of FV audit, namely, the FV provider, it is important to delimitate our area of inquiry linked to it. This is because either management or auditors can resort to third parties - valuation experts -, in order to build FV estimate or obtain audit evidence on the subject. ISA 500 *Audit evidence* and ISA 620 *Using the work of an auditor's expert* made a clear distinction between management's valuation and the auditor's own valuation, in terms of experts. Thus, management's expert work is used by the auditee to assist him in preparing the financial statements and auditor's expert work is used by the auditor to assist him in obtaining sufficient appropriate audit evidence. If we want to enlarge the valuation provider typology, we firstly refer to the revised ISA 540 that states that management may have, or the entity may employ individuals with the skills and knowledge necessary to make the accounting estimates; and in some cases, management may need to engage an expert to make, or assist in making the estimations (IAASB, 2017). The revised ISA 540 resumes this issue and provides the differences between an expert which is an individual or organization possessing expertise in a field other than accounting or auditing, whose work is specifically generated for the auditee, and the external information source which is an individual or organization that provides publicly available information used by the auditee (IAASB, 2017). Similarly, ISA 500 considers as audit evidence sources, those inside and outside the entity, as well as the information prepared using the work of a management's expert. In his turn, the auditor's expert may be either an internal expert (partner or staff of the audit firm or a network firm), or an external expert.

In our inquiry, we deal with the case of the auditee's valuator, both in the case of a valuation generated internally by the auditee (auditee's management estimation), and of an estimation provided by an external consultant of the auditee (auditee's management's expert). This is because we believe that the work of the valuator that assists the auditor - the auditor's expert according to ISA 620 -, is integrated in the audit process global effort. Furthermore, this case does not lead to a real delimitation between the interested parties in the audit of fair value. Besides that, the ways to act and the efforts of the auditor differ in magnitude and nature when he verifies the valuation provided by the auditee versus when he evaluates the adequacy of his own expert's work. We chose to focus on the most demanding task for the auditor, which has the potential to induce the higher risks for the audit of estimates. In short, by FV estimate provider, we understand both the management who performs the valuation through its employees, and an external specialist including the pricing services which provide valuation expertise and data.

As a consequence of reviewing ISA 540, IAASB decided to propose changes to ISA 500 for third-party pricing and non-pricing sources, under a new name, external information sources.

There are pricing services for financial instruments, governmental organizations, central banks or stock exchanges data. At the same time, although it does not treat this case in the revised ISA 540, IAASB is aware of the need to revise in the future ISA 500, including for the distinction between external information sources and a management's expert. So far, ISA 500 disentangles these two notions but not in a clear way. According to this standard, the management's expert is an individual or organization that possess specific expertise which is applied in making an estimate for the financial statements. If the individual or organization provides prices (the new ISA 540 (A35) also includes here the price data) data regarding private transactions, not otherwise available to the entity, which the entity uses in its own estimation methods, such information do not lead to the work of management's expert (IAASB, 2018 – ISA 500).

As for our second influential factor of FV audit which we intend to discuss, *Auditors understanding of the valuation process* is a premise for the quality of audit of the valuation process. Bratten et al. (2013) think that the lack of valuation knowledge of auditors, explicable by the complexity of FV, is one of the elements affecting the audit process performance and the ability of auditors to find and incorporate in their judgement management bias in FV estimation. IAASB, in its updated ISA 540, highlights the need for specialized skills or knowledge earlier in the auditing process, in relation to either the understanding or with the identification and evaluation of the risks of material misstatement (IAASB, 2017).

4.3 Research methodology

4.3.1 Fair value estimation issues

In this section we focus on valuation as the process that concludes on fair value estimation, and in particular on FV provider, FV measurement and FV disclosure. The section is the result of international audit standards and literature review on the subject which provide a list of potential positive and negative effects on the FV audit of the influential factors linked to the valuation process. This enables us to design the experiment that will confirm/ infirm these theoretical or empirically demonstrated assertions in earlier research.

In accordance to the standard's risk assessment procedures, the auditor should obtain an understanding on how management identifies the relevant methods, assumptions or sources of data, as well as the need for changes in them (ISA 540, para. 13 (h (ii (a))))). This includes how management selects or designs, and applies, the methods (including the use of models), selects the assumptions (including consideration of alternatives and identification of significant assumptions) and selects the data to be used. Furthermore, it is important to know how

management understands the degree of estimation uncertainty and addresses it (ISA 540, para. 13 (h (ii (b,c)))). Para. 13 (f) in ISA 540 addresses the understanding of how management identifies the need for, and applies, specialized skills or knowledge (including the use of an expert), while para. 13 (g) focuses on the entity's risk assessment process in identifying and addressing risks. The auditor should consider indicators for possible management bias and their implications for the audit (ISA 540, para. 32). All these audit specific steps were subsumed to our research issues, the FV provider, FV measurement and FV disclosure.

In terms of its effects, the use of a valuation expert apparently reduces the audit risk. Goncharov et al. (2014) designed this hypothesis in correlation with audit fees supposed to decrease as the auditor effort also decreases. But the study failed to obtain statistically significant results. This favors the opinions that the appeal to a valuator is not, in any circumstances, beneficial. There are studies asserting that the reliability of FV estimate augment for the investors when valuation experts' services are used (e.g. Muller & Riedl, 2002; Bratten et al., 2013). This opinion is shared by the American and international auditing standard setters, PCAOB (2014) and IAASB (2018). As general positive effects, we also note the results of the Deloitte (2010) survey on the enhanced quality of financial reporting and audit when using pricing services. Using an internal (management's expert) or an external valuator is another issue discussed in literature, the prevailing opinions being in favour of the second one. The valuation process is in this case more objective (Barth & Clinch, 1999; King, 2006).

Other issues to characterize FV estimate, apart FV provider effects described above, are linked to the valuation report/document prepared by an external expert or by management. In this section, we discuss about FV measurement, as volume and type of quantitative data presented in this report, and the quality of disclosure (FV disclosure). It seems that auditors have the tendency to verify in detail the values provided by valuation reports, if there is an adequate disclosure, mainly provided by valuation experts (Salzsieder, 2016), reducing management opportunism, as Abernathy et al. (2015) claim. This is a positive effect.

Regulators, such as PCAOB (2011) and SEC (2011) are concerned about the auditors' inclination to focus exaggeratedly on valuator's reports, neglecting their own verification steps or audit procedures. Joe et al. (2017) reckon other weaknesses if the data disclosed in the valuation report are significant in quantity, in the case of a high risk of the client's internal control. In this case, the auditor is inclined not to proceed to supplementary tests, for example checking the subjective inputs, but other details and objective inputs. Also, sometimes, auditors do not have access to the particular data used by valuator as inputs to construct the value, such

as for example, proprietary specific data (Glover et al., 2014; Cannon & Bedard, 2017). Finally, the nature and volume of the tests that auditors will apply to verify FV are influenced by the valuation report content, in the case of a weak internal control of their client (Brown-Liburd et al., 2014; Joe et al., 2017).

As documented, divergent opinions arise on the appeal to an external valuation expert and its effects on the FRQ and audit process. Besides preponderant favourable opinions as enhanced reliability, objectivity and, in general, quality of the financial information, and also inclination to verify in detail the values provided by valuation reports (so an increasing quality of audit), some reserves were also expressed about the benefits of using such external services. Table 4.1 presents in short the above discussion in terms of positive and negative effects.

Table 4. 1 Potential effects of the use of valuation experts' work in the audit process

<i>Positive effects</i>		<i>Negative effects</i>	
a	Increase of FV reliability (Muller and Riedl, 2002; IAASB, 2017; PCAOB, 2017)	e	Over reliance on valuation reports, neglecting auditor;s own verification steps (PCAOB, 2011; SEC, 2012)
b	Increase of reporting and audit quality (Deloitte, 2017)	f	Over reliance on the valuation report, if the internal control of the auditee is weak (Joe et al., 2017; Brown-Liburd et al., 2014)
c	More objectivity in the case of the use of an external versus internal valuator (King, 2006); a FV estimation less risky if it is generated by an external source (Brink et al., 2016)	g	Focus on details and objective data instead of subjective inputs, if the valuation reports are rich in quantitative data (level of detail), and if the internal control of the auditee is weak (Joe et al., 2017)
d	If the appeal to valutors is disclosed, inclination to verify in detail the values provided by valuation reports (Salzsieder, 2016)	h	Lack of access to internal data used by valutors (subjective inputs, proprietary models) (Glover et al., 2014; Cannon & Bedard, 2017)

For the present research, we chose the effects testable in our experiment, specifically those that suggest alternatives between management estimation and the use of an external valuation expert, respectively between two different points of interest of the auditor, as volume, type of the data and valuation approach (FV measurement), and as disclosure of FV estimation (i.e. the valuation report or management's estimation worksheet).

4.3.2 The experiment framework

In the proposed framework, the dependent variables which we judged as appropriate are *Likelihood that the auditor develops additional effort to further investigate the FV estimate* and *Higher risk of misstatement of FV estimation*. The first one will be implied in our main tests and the second one will serve us mainly for robustness tests. In our view, these are related to the factors discussed already as environmental and task specific with which 'FV estimate provider'

and ‘FV measurement and disclosure’, and therefore the global valuation process in our view, come into interdependence. Specifically, we judge if the choices concerning FV estimate provider, and also the type and content of the documents disclosed either by the auditee’s manager (or an internal valuator) or the external expert, can reduce or multiply the effects of uncertainty, complexity and management bias. These aspects are encapsulated in the magnitude of risk of misstatement that the participants will assess, as well as in the additional time and efforts to investigate FV measurement and disclosure.

The independent variables are built based on Table 4.1 and will be associated with both dependent variables. Table 4.2 offers details on our judgement. For the variables ‘FV measurement and disclosure’, our choices are similar to the quantifiable elements suggested to auditors through ISA 540, when verifying an accounting estimate for a financial statement item, *i.e.* the relevant quantitative and qualitative valuation attributes and the sources of data that would provide appropriate measures of those attributes.

Table 4. 2 Independent variables choices

	<i>Independent variables</i>	<i>Correspondence with Table 1</i>	<i>Condition</i>	<i>Explanations</i>
1	<i>FV provider:</i> External versus internal valuation expert	c,d,h		The preference for an external valuator versus an internal one (management’s estimation) will be tested.
2	<i>FV measurement:</i> Volume and type of quantitative data in the content of the Valuation Document*	g,h	quality of the internal control of the auditee (weak or strong)	The auditor neglects the subjective inputs and favors the objective inputs and other details.
3	<i>FV disclosure:</i> Quality of disclosure in the Valuation Document	e, f		The auditor can have only partial access to adequate data to obtain sufficiency of audit evidence about FV, such as internal data, proprietary models information, definitions of the concepts, approaches explanations, market inputs.**

* Valuation Document designates as well the valuation report of the external expert in the standard format agreed by his professional association (ISA 500 includes a stipulation on the use of analysts’ reports, as information from a source independent of the entity), and the management specific documents provided as justification for FV measurement.

** ISA 540’s recommendations on the steps to verify accounting estimates – as references for the minimal requirements to a valuation report, are presented in the next section. We added some elements judged as relevant to appreciate the FV measurement / disclosure accuracy.

The effects of the association between the independent variables in a matrix of 2x2x2 form, presented above, will be assessed as the auditor’s expectations concerning the audit risk and potential additional effort to be made.

Table 4.3 presents the independent variables, their association, and the case materials inside the cells, in the research framework that we propose.

Table 4. 3 Experiment framework

<i>Quality of internal control</i>	<i>FV measurement and disclosure</i>	<i>FV provider</i>	
		<i>External valuation expert</i>	<i>Management's estimation</i>
	(1) FV measurement: Volume and type of data in the Valuation Document		
Weak/ Strong	<i>Focus on predictive data and other details in the construction of the variables</i>	Typical valuation report Data concerning level 3 of FV and the income approach	Management's valuation worksheet for the estimation; Data concerning level 3 of FV and the income approach
	<i>Focus on current data and other details in the construction of the variables</i>	Typical valuation report Data concerning level 3 of FV and the cost approach	Management's valuation worksheet for the estimation; Data concerning level 3 of FV and the cost approach
	(2) FV disclosure: Quality of disclosure in Valuation Document		
Weak/ Strong	<i>Focus on inputs characteristics, their source, risk of their volatility</i>	Typical valuation report Complete as data related to this issue	Management's valuation worksheet for the estimation Containing valuation requirements on this issue
	<i>Focus on valuation methods, assumptions and models</i>	Typical valuation report Complete as data related to this issue	Management' valuation worksheet for the estimation Containing valuation requirements on this issue

Based on the discussion above, we first investigate if and in which cases the use by the management of an external expert versus the internal one, decreases the estimation risk and effort for the auditors, when the valuation approaches (income and cost) in FV measurement are manipulated. Secondly, we investigate if and in which cases the use by the management of an external expert versus the internal one, decrease the estimation risk and effort for the auditors, when the Valuation Document content is manipulated as features preferred by the auditor (focus on the inputs characteristics, their source, and risk of their volatility instead on methods, assumptions and models). The two investigations are made in two scenarios about the quality of the internal control, both possibilities (weak or strong) being equally possible.

4.3.3 The experiment description and participants

Both dependent variables were quantified by the participants on a 7-point Likert scale, anchored by 1 (very low likelihood of a higher risk of misstatement/ developing additional effort) and 7 (very high likelihood of a higher risk of misstatement/ developing additional effort).

For the variable '*Higher risk of misstatement of FV estimation*', we recommended to participants that they link their assessment to ISA 540's requirements in the case of risk

assessment procedures and related activities. As response to the assessed risks of material misstatement, the standard specifically recommends, to face the complexity, judgement (management bias) and estimation uncertainty as follows: whether the method and significant data and assumptions are appropriate in the context of the applicable financial reporting framework; whether significant data is relevant and reliable; whether management has appropriately understood or interpret significant data; whether the integrity of significant data and assumptions has been maintained in applying the method; whether the calculations are mathematically accurate and appropriately applied; when management's application of the method involves complex modelling, whether judgements made have been applied consistently, the design of the model meets the measurement objective and is appropriate in the circumstances; if changes of the models of the previous period or adjustments to the output of the model are appropriate; when management has not appropriately addressed the estimation uncertainty, the auditor shall develop a point estimate or range.

So that the participants in the experiment better understand the variable 'A higher risk of misstatement of FV estimation', we also recommended them to imagine the likelihood that the auditor that is the character in our case materials requires value adjustments. Appendix 1 Measurement bases of accounting estimates, para. 8 of ISA 540 provides a suggestion in the context of making an estimate. This is the nature and extent of any adjustments that may be made to the estimate arising from the application of method(s) used to build the estimate, for example to reflect practical limitations in the validity of the valuation technique(s) used in measuring what it purports to measure. For the variable '***Likelihood that the auditor develops additional effort to further investigate the FV estimate***' we recommended to participants to associate the additional effort with additional audit procedures during both the risk assessment phase and the gathering of audit evidence one. We also offered details of ISA 540 in the case materials, starting from one requirement of the extant ISA 540, *i.e.* to test how management (or its external expert, we added) made the accounting estimate and the data on which it is based. The new ISA 540 adopted a control-based approach, much more applied and expanded than the extant ISA 540.

The independent variables are of between-participants type, all integrated in a 2 x 2 x 2 experimental design. A first variable is *FV provider*, an external expert (external valuation) or management's estimation (internal valuation). For the Romanian context, both the external valuator and the internal valuator are required to be approved as members of ANEVAR, the national professional association. In these circumstances, we expect fewer evaluation cases through the company's internal staff due to the complexity of the valuation tasks and the specific

requirements, and thus barriers to become an authorized valuator. The second variable is the *FV measurement and disclosure*, which in the view of regulators/ standard setters and that of literature brings some effects of the valuation process on the quality of the audit process. The variable is processed under two iterations, FV measurement and separately FV disclosure. The third variable in the matrix is the *internal control quality*. In order to capture the impact of the variables, as Tables 4.1 and 4.2 reveal, we created 8 cells as interactions between FV estimate provider and FV measurement and disclosure, each interaction being doubled for the case of weak internal control and strong internal control (see Table 4.4 below). In our discussions with the respondents, we only made brief reference to internal control, mentioning that it can be differentiated by features such as: existence of separation of tasks for the specialized personnel, existence of all supporting documents, existence of written procedures and policies for all activities.

The experiment framework and the case materials - that result in 16 iterations - are presented in Table 4.4.

Table 4. 4 Case materials

<i>FV measurement and disclosure</i>	<i>FV provider</i>	
	Use of a valuation external expert (Valuation Report)	Management's estimation (Management Valuation Worksheet)
<i>Conditioned by the quality of internal control: weak or strong (a and b)</i>		
FV measurement: Volume and type of quantitative data in the Valuation Document		
Case material 1 – a standard and comprehensive Valuation Report or Management Valuation Worksheet (hereafter Valuation Document 1) containing a valuation based on the income approach; suggestions on checks are made to participants [†] :	Case A/ a,b	Case B/ a,b
<ul style="list-style-type: none"> • How the inputs for Level 3^{**} in the value hierarchy were found and if they represent the assumptions that market participants would use; • Particularly (for the income approach): ✓ Whether the estimation of fair value was based on rents or quotations from an active market; ✓ If the estimation of fair value was based on the listing of a real estate agency, if it comes from a similar market and if it reflects the market conditions. 		
Case material 2 – the Valuation Document 1, modified, containing a valuation based on the cost approach; suggestions on checks are made to participants [†] :	Case C/ a,b	Case D/ a,b
<ul style="list-style-type: none"> • How the inputs for Level 3^{**} in the value hierarchy were found and if they represent the assumptions that market participants would use. • Particularly (for the cost approach): ✓ How were the input data obtained and whether these represent the assumptions that market participants would use; ✓ If the estimate of the gross replacement cost and of the 		

depreciation is sufficiently substantiated.		
FV disclosure: Quality of disclosure in the Valuation Document		
Case material 3 – the Valuation Document 1, without differentiating the valuation approaches, for which participants received the following list of issues to control ^{***} :		
<ul style="list-style-type: none"> • Relevant quantitative and qualitative valuation attributes; • Extent to which observable data is available to measure relevant valuation attributes; • Method to develop information about the sensitivity of the estimate to possible variations in the initial data. 	Case E/ a,b	Case F/ a,b
Case material 4 – the Valuation Document 1, without differentiating the valuation approaches, for which participants received the following list of issues to control ^{***} :		
<ul style="list-style-type: none"> • Selection of methods; • Selection of assumptions; • Models' content. 	Case G/ a,b	Case H/ a,b

^{*}inspired from ISA 540, section Risk assessment procedures and related activities, Application and others explanatory material: A40-41 and A 127-129 and respectively Appendix 1;

^{**} the approaches supposed by Level 3 (income, respectively cost); income approach is supposed to incorporate more predictive data than cost approach that which uses historical and current data; also, income approach is supposed to use less subjective inputs than cost approach;

^{***} inspired from ISA 540, section Application and others explanatory material: A36-49; we consider it as hints for auditors to control this valuation stages.

For all the cases, we provided participants with experimental materials – three Valuation Documents designed to capture the elements to test. We titled it ‘Valuation Document’ and manipulated it as the document prepared by internal or external valuation expert. We also manipulated the Valuation Documents as quality of disclosure and content.

For the item ‘Volume and type of quantitative data in Valuation Document’ (FV measurement), the cases are divided after the FV estimation level according to the IFRS 13 hierarchy and the valuation standards prescriptions. Thus, using the same declinations of the Valuation Document as explained above, we manipulated the Level 3 of FV estimation to create cases for the income, respectively for the cost approaches. The two approaches denote, in our view, a difference in volume and type of inputs. (The volume of inputs will be also suggested in the experiment matrix when FV measurement is combined with FV provider; the volume of data is more significant in the Valuation document provided by an external instead of an internal valuator). The income approach is viewed as more linked to market inputs and more predictive data than the cost approach, which is linked more to historical combined with current (market) data. Our arguments for choosing Level 3 to be tested is the difficulty of using the other value levels. This is because in Romania only the real estate are frequently evaluated for financial reporting, tax and loan guaranteeing purposes. The approaches used in this cases are usually income and cost, and not market approach, if the assets were not for sale (Level 2 in the value hierarchy). The financial instruments which could be evaluated at the Levels 1 and 2, require extremely rare evaluations. Furthermore, we chose the income and cost approaches applied for real estate as we consider these were so far neglected in the fair value accounting literature. This provides us with the opportunity to bring insights on the subject.

The essence of the income approach is that, in estimating the value of an asset, the present value of future benefits (revenues) that could be obtained from the use of that asset is taken into account. Specifically, the approach involves forecasting a series of periodic cash flows or other forms of constant future results. To these series of cash flows or expected results, an appropriate discount / capitalization rate, derived from the market, is applied to establish the present value of the income stream generated by the property. In many cases, the series of periodic cash flows is supplemented by the so-called residual value anticipated for the end of the forecast period. The residual value is the possible sale price of the property evaluated at the end of the forecast period.

The cost approach supposes estimation of the gross replacement cost of a given asset, from which the depreciation determined for that asset is subtracted. The approach is often identified with its application, the net replacement cost. It sets the upper limit to which the market would pay for a new asset of the same type. The gross replacement cost can be reliably estimated if the valuator has access to adequate sources of information on cost components and other market references. Reference prices can be obtained from catalogues of suppliers or construction quotas for real estate. Depreciation is an estimator of the valuator and has three components: physical, functional and economic (external). For the item "Quality of disclosure in the Valuation Document" (FV disclosure), we provided, apart the valuation document, a list of auditor steps to verify FV estimate disclosure, according to ISA 540, such as: inputs, methods and assumptions made for the measurement.

Another observation is linked to the auditor's consultant. We recommended auditors to judge from their own perspective in valuation issues, without excluding the contribution of their own consultant in the valuation process. Therefore, we thought that it is reasonable to assume that the participants resorted to the advice of a valuator – especially in the Romanian context, where we suppose a lack of valuation competencies – and we are interested in the overall effort to analyze the report / valuation worksheet (auditor + his expert). Brink et al. (2016), in their study for the Chinese emergent market, expect the appeal of the auditor to his superior or to a pair for an advice, due to the FV complexity and high uncertainty. In our paper, the frequency of such cases will be observed in the demographic test. More precisely, we wonder if the appeal of the auditor to his own valuator will affect his judgment and interfere with the perception on the valuation provider, respectively on the FV measurement and disclosure.

The Valuation Document provided to the participants is an adaptation of a real Valuation Report obtain from a prestigious local firm specialized in property valuation. The report was made

according to the valuation standards applicable in Romania, SEV, prescribed by ANEVAR, similar to International Valuation Standards (IVS) and to professional customs, including, for example, valuator certification or limitative conditions. We firstly removed all the data that could divulge the valuator, his client and the property being subject to valuation. Then, we manipulated the Report according to our intentions as revealed in Table 4.3 and 4.4. Therefore, we replicated this Valuation Report (cases A, C, E, G) into a Management Valuation Worksheet in order to obtain the experimental materials for the cases B, D, F, H. Then, we adapted the same Valuation Report in order to reveal as the valuator's opinion only one of the values and approaches applied in the valuation process, either income (cases A, B), either cost approach (cases C, D) or both (cases E, F, G, H). An excerpt of the Valuation Report is provided in Appendix 2 (for the case E / cell A).

In order to simplify the presentation, according to Table 4.4, we will designate the cases for FV measurement as Income approach versus Cost approach and the cases for FV disclosure as Valuation attributes and sensitivity of data versus Methods, assumptions and model.

The case materials were checked with two experimented auditors and, after some clarifications, we proceeded to a pilot test with 160 students, master degree, first year, three specializations on audit, accounting and diagnosis and property valuation. The students had completed at the bachelor's and master's level two courses in the field of auditing and two other courses in the field of valuation of assets and enterprises, attesting their competencies in the field of our research study. Some other refinements were again made on our case materials after these pilot testing. The experimental materials have been applied through a direct meeting provided by the regular workshops of the auditors registered for the Chamber of Financial Auditors in Romania (CAFR). The applications were carried out successively, in the period September – November 2019 in two meetings organized within regional branches, Cluj and Braşov, representative cities in Romania. Overall, the number of the participants was 76.

As statistical tests proposed, those correlated to our aim are descriptive statistics, univariate and multivariate analysis and simple effects test.

4.4 Results and discussion

4.4.1 Auditors characteristics

Before the experiment begins, we performed some manipulation checks in order to verify the auditors understanding on the issues investigated, namely the fair value provider and the level of the FV in the value hierarchy, associated to the valuation approaches. An excerpt from this

preliminary case study, as we named it, is presented in Appendix 3. The results were satisfactory (almost all of the auditors provided accurate answers for FV provider and about 70% for the valuation approaches associated to value levels). Considering the last part of these results, we continued to process the data in order to view the extent to which auditors rely on valuator or their own knowledge in the field of real estate valuation methodology.

In the last part of the meetings, we ask the participants to fill a short demographic survey. It has integrated variables related to the way auditors practice their profession (independently or within an audit firm), their position within the audit firm (partner, manager, senior or junior), experience in the audit profession as number of years, experience in FV auditing as number of cases / reports, frequency of training courses on FV (for the whole of their activity), respectively, if they have used the services of a valuator (internal, of the audit firm, or external) (for the whole of their activity). Specifically for the purpose of our experiment, we checked if the group of auditors have enough valuation expertise to understand the valuation process. In fact, the valuation profession has its own challenges, competencies and experience required. This profession is guided by a set of specific standards, professional guides and specific literature.

Table 4.5 presents the description of the auditors as way of practicing the profession, respectively general experience in audit and in fair value issues.

Table 4. 5 Descriptive statistics for auditors' main characteristics

		Position					
		<i>Partner</i> (n=32)	<i>Manager</i> (n=10)	<i>Senior</i> (n=10)	<i>Junior</i> (n=6)	<i>Other</i> <i>situations</i> (n=2)	<i>Overall</i> (n=76)*
Affiliation**							
Independent	No. of	13	4	2	0	0	19
Audit firm	cases	19	6	8	6	2	41
Audit experience (years)**							
1-5 years	No. of cases	2	2	6	6	0	16
5-10 years		14	4	0	0	0	18
> 10 years		16	4	4	0	2	26
Fair value audit experience**							
Less than 15 cases	No. of cases	26	10	8	6	2	52
More than 15 cases		6	0	0	0	0	6
Training on FV subject **							
Yes, often	No. of cases	4	0	2	0	0	6
Yes, occasionally		16	8	6	2	0	32
No		12	2	2	4	2	22
Appeal to auditor's own valuator**							
Frequently	No. of cases	12	2	0	0	0	14
Occasionally		16	4	4	0	2	26
Never		4	4	6	6	0	20

*16 missing information for certain variables; **auditors were advised to judge the criterion as a whole of their activity.

The majority of the 76 auditors included in our experiment so far have more than 10 years of experience in audit. However, for the Romanian context, the concept of fair value and its implementation are relatively new; that explains the fair value audit experience of our participants, less than 15 cases in their whole activity, being the prevailing response. This observation is coherent with the results for the last two descriptive items, related to the frequency of fair value trainings and the use of their own valuator. The auditors seems to resort quite often to a valuation expert (for 23% of cases frequently and for other 43% occasionally).

4.4.2 Variables' interaction- multivariate and univariate analysis

We firstly tested the interactions between both dependent variables and the independent ones, the independent variables being put in relation one by one, and then as combinations between them (Table 4.6, Table 4.7).

Table 4. 6 Multivariate analysis results

<i>Panel A – related to FV measurement</i>				
<i>Independent variables</i>	<i>F(Wilk's k)</i>	<i>p-value</i>	<i>Partial η²</i>	<i>Observed Power</i>
FV measurement	0.465	0.633	0.031	0.119
FV provider	1.103	0.345	0.071	0.225
Internal control	9.830	0.001***	0.404	0.972
FV measurement x FV provider	3.777	0.035**	0.207	0.642
FV measurement x Internal control	1.702	0.200	0.105	0.328
FV provider x FV measurement x Internal control	2.696	0.084*	0.157	0.492
FV provider x Internal control	0.588	0.562	0.039	0.138
<i>Panel B – related to FV disclosure</i>				
<i>Independent variables</i>	<i>F(Wilk's k)</i>	<i>p-value</i>	<i>Partial η²</i>	<i>Observed Power</i>
FV disclosure	0.263	0.771	0.018	0.087
FV provider	2.688	0.086*	0.161	0.489
Internal control	4.007	0.029**	0.223	0.668
FV disclosure x FV provider	0.877	0.427	0.059	0.186
FV disclosure x Internal control	1.589	0.222	0.102	0.308
FV provider x FV disclosure x Internal control	0.832	0.446	0.056	0.178
FV provider x Internal control	1.005	0.379	0.067	0.207

*Significant at 1%, **Significant at 5%, ***Significant at 10%.

Notes: Partial η², measured on a scale of 0 to 1, indicates the proportion of the variance in the dependent variables explained by the independent variables; Observed Power, measured on a scale of 0 to 1, indicates the likelihood that an effect will be detected.

Table 4. 7 Univariate analysis results for the 'Likelihood that the auditor develops additional effort to further investigate the FV estimate'

<i>Panel A – related to FV measurement</i>				
<i>Independent variables</i>	<i>Sum of squares</i>	<i>df</i>	<i>F</i>	<i>p-value</i>
FV provider	2.156	1	1.159	0.290
FV measurement	1.539	1	0.827	0.370
Internal control	30.464	1	16.369	0.000*
FV provider x FV measurement	14.231	1	7.647	0.010**
FV provider x Internal control	0.003	1	0.001	0.971
FV measurement x Internal control	6.539	1	3.514	0.071***
FV provider x FV measurement x Internal control	9.385	1	5.043	0.032**
Error	55.833	30		
<i>R Squared = 0.522; Adjusted R Squared = 0.411</i>				
<i>Panel B – related to FV disclosure</i>				
FV provider	0.030	1	0.016	0.901
FV disclosure	0.324	1	0.171	0.682
Internal control	14.317	1	7.568	0.010**
FV provider x FV disclosure	3.259	1	1.723	0.200
FV provider x Internal control	2.428	1	1.283	0.267
FV disclosure x Internal control	4.629	1	2.447	0.129
FV provider x FV disclosure x Internal control	1.987	1	1.050	0.314
Error	54.867	29		
<i>R Squared = 0.331; Adjusted R Squared = 0.169</i>				

*Significant at 1%, **Significant at 5%, ***Significant at 10%.

Table 4. 8 Means and simple effects for the 'Likelihood that the auditor develops additional effort to further investigate the FV estimate'

<i>Panel A – related to FV measurement – when internal control is weak</i>			
FV provider			
FV measurement	Use of a valuation external expert	Management's estimation	Test of simple effects
Income approach	5.17 ^a (0.833) ^b n=6	5.40 (0.510) n=5	F=0.075 p=0.788
Cost approach	4.50 ^a (0.500) ^b n=4	5.20 (0.374) n=5	F=0.547 p=0.470
Test of simple effects	F=0.536 p=0.475	F=0.050 p=0.825	

^a - mean; ^b - standard error

<i>Panel B – related to FV measurement – when internal control is strong</i>			
FV provider			
FV measurement	Use of a valuation external expert	Management's estimation	Test of simple effects
Income approach	3.50 ^a (0.719) ^b n=6	1.75 (0.250) n=4	F=4.287 p=0.057
Cost approach	2.50 ^a (0.289) ^b n=4	5.25 (0.750) n=4	F=8.823 p=0.010**
Test of simple effects	F=1.400 p=0.256	F=14.292 p=0.002**	

^a - mean; ^b - standard error

Panel C – related to FV disclosure – when internal control is weak

FV disclosure	FV provider		Test of simple effects
	Use of a valuation external expert	Management's estimation	
Valuation attributes and sensitivity of data	4.67 ^a (0.803) ^b n=6	5.00 (0.548) n=5	F=0.132 p=0.722
Methods, assumptions and model	4.00 ^a (1.00) ^b n=3	4.60 (0.400) n=5	F=0.293 p=0.596
Test of simple effects	F=0.386 p=0.544	F=0.174 p=0.683	

^a - mean; ^b - standard error

Panel D – related to FV disclosure – when internal control is strong

FV disclosure	FV provider		Test of simple effects
	Use of a valuation external expert	Management's estimation	
Valuation attributes and sensitivity of data	3.67 ^a (0.615) ^b n=6	2.00 (0.408) n=4	F=4.590 p=0.050**
Methods, assumptions and model	3.50 ^a (0.500) ^b n=4	4.00 (0.577) n=4	F=0.344 p=0.567
Test of simple effects	F=0.046 p=0.833	F=5.508 p=0.034**	

^a - mean; ^b - standard error

*Significant at 1%, **Significant at 5%.

The results show that only if the internal control is strong as quality, the auditors really differentiate the FV issues (Panels B and D, Table 4.8). We believe that when the internal control is weak as quality, the auditors do not proceed further to deepening valuation process nuances and to detect new risks, because they already observed global risks for the auditee. Therefore, the cases when the quality of internal control is weak, do not present statistical relevance as differentiated perceptions (Panels A and C, Table 4.8), but the mean values suggest a preference for an external expert, the management's estimation requiring more audit effort. When the quality of internal control is higher, it can be observed from panel B that the FV provider has an impact on the possible effort that the auditor is going to perform in order to investigate more the FV estimate, for both cases: historical/current data (cost approach, $p=0.010$) or predictive inputs (income approach, $p=0.057$). Furthermore, the probability of additional effort increases when the FV provider is an external expert in the case of income approach and when the estimates are made internally for the cost approach. This inconsistency of the results lets us to believe that the auditor does not discern very precise the type of the valuator (external expert or management employee) in correlation with the valuation approach that was applied, cost or income. This could be explained either by a valuation practice entirely specific to the Romanian context, either by a very good understanding of the valuation approaches content and technical application.

The first potential explanation, linked to the audit and valuation context, is that in practice, a real differentiation of the valuation source does not exist. We think that companies are rather appealing to a specialist for the valuation process (FV estimation), often suggested by the auditor, who subsequently heavily relies on the competencies of a tested and well-known valuation expert. The consequence is that the auditor does not investigate himself, in a proper manner, the valuation process.

The second potential explanation, a valuation expertise proved by the auditor, does not seem so plausible to us, observing the descriptive statistics that revealed a low degree of FV use and audit (as training and missions). Indeed, the cost approach is more difficult to apply compared to the income one, because it has a strong technical component. Hence, the auditors' confidence in an external expert is understandable.

The disclosure issues inside the Valuation Document are important for the auditors, again, only when the internal control proves to be of higher quality (Panel D).

As we expected, the auditors are not so attentive to the valuator's methods, assumptions and models construction, but to the details on the quality of the inputs and outputs disclosed, and to their volatility (variable Valuation attributes and sensitivity of data with $p=0.050$). However, auditors differentiate the valuator's type and his way of disclosing the methods, assumptions and models, but not in a way that has statistical significance. Finally, when the estimation is made by the management, the results are statistically significant, indicating that the professionals are aware of the two issues of FV disclosure, *i.e.* Valuation attributes and sensitivity of data, respectively Methods, assumptions and model ($p=0.034$).

Overall, auditors favour management's estimation (instead of the estimation of an external expert) for FV disclosure (mean values are higher for the use of an expert, denoting additional effort from the auditor). As above, we also infer here a poor understanding of a Valuation Document prepared on the basis of the professional valuation standards.

Untabulated statistics reveal similar results when we changed the dependent variable, using 'A higher risk of misstatement of FV estimation' instead of 'Likelihood that the auditor develops additional effort to further investigate the FV estimate' to proceed to the univariate analysis and the simple effects. These results can be seen as robustness tests, supporting our data and auditors' message (see Appendix 4).

4.5 Conclusions of the study

The first part of the discussion is about auditors' perceptions on *FV measurement* issues. The multivariate analysis (Table 4.6, Panel A) provides a first clue about the importance of Internal control quality, FV provider and FV measurement which proved to have the greatest contribution to the variance of both dependent variables (Additional effort to verify FV estimate as main variable, and Higher risk of misstatement of FV estimation). The univariate analysis (Table 4.7, Panel A) confirms this first observation and supplementary indicates that the three variables just mentioned act only in combination to generate a reaction from the auditor. Firstly, the auditors are sensitive to the type of valuator and of the internal control. This confirms our choice to link auditors' attitude by the internal control and the valuator type (external or internal). Then, for 3 from 4 of our cases, the mean values and the test of simple effects indicate the preference for an external valuator (Table 4.8, Panels A and B). The exception is for the case of the income approach used in FV estimation and a strong internal control occurrence.

If we look to the statistical significance of our findings only (Table 4.8, Panel B), it appears that the auditors discern between FV providers only in the case of the application of the cost approach in the valuation report, preferring the external valuator to the internal one (management estimation). This is confirmed for the scenario of a high internal control quality. Another observation, statistically relevant, is that the auditors consider that they would make more effort when verifying cost approach instead of income approach, when FV is a management estimate.

Considering *FV disclosure* issues and the auditor's perceptions, the results of the multivariate analysis (Table 4.6, Panel B) suggest as significant for the additional effort of the auditor (as well for the other dependent variable, Higher risk of misstatement of FV estimation) the Internal control quality and FV provider variables, but not FV disclosure taken individually or in combination with other variables. The univariate analysis (Table 4.7, Panel B) confirms only the internal control impact. The mean values indicate a higher confidence of the auditor in an external valuator, for 3 from the 4 cases.

Other results, statistically significant (Table 4.8, Panel D), reveal that if the internal control is strong, 'Valuation attributes and sensitivity of data', as component of FV disclosure, differentiates in the auditors' perceptions, in the sense of additional effort induced for the auditor by a valuation made by an external, instead of an internal valuator. Continuing with the relevance of management's estimation for the auditors, they clearly discern between the components of FV disclosure, appreciating more (less audit effort) the component containing Valuation attributes and sensitivity of data.

These findings could be linked to the high frequency of the appeal of the auditor own valuator, indicated by the demographic test. This behavior could affect his own judgment and interfere with the perception on the valuation provider, respectively on the FV measurement and disclosure. Also, this could explain a poorer understanding of the Valuation report presentation of data as a mean of disclosing the estimation, compared to the measurement *per se*, inside its content.

Overall, if we observe the mean values for the auditors' perceptions (without considering the statistical significance of the simple effects results), it seems that they rely more on the expertise of an external valuator than on management estimations. Our results are therefore in line with those obtained by Brink et al. (2016) who found that the auditors consider the FV estimation less risky if it is generated by an external source, and therefore they will further investigate this estimation less, as well as King (2006) who claimed a greater objectivity when using an external valuator. This also confirms the over reliance of the auditor on the Valuation report if the internal control is weak, issue argued by Joe et al. (2017) and Brown-Liburd et al. (2014), but inserted by us as a positive aspect, when compared to the management alternative.

Another general observation is linked to two approaches we investigated, income and cost, both as level 3 data in the fair value hierarchy. The income approach could be more reliable, due to its anticipative side, but at the same time, more volatile and subjective because it is based on predictions. On the other side, cost approach is more anchored in the present, sometime using also historical data, and in the same time subjective because of the need to update the past inputs and the choices for current data on the market. However, for 3 from 4 cases (in Table 4.8, Panels A and B), independently of the quality of the internal control, and contrary to our expectations, the income approach is listed as requiring more audit effort than the cost approach.

The described results are further discussed in the light of FV influencing factors that the literature evoked, and particularly the link between FV provider, the factor we investigated, and the other factors.

FV estimated for real estate presents complexity especially when using valuation models, level 3, income and cost, as in our case. We believe that in our study, FV presents a higher complexity and we followed which of the two approaches induces bigger concerns for the auditors. It seems that is the income approach. We argue that one of the explanations is the appearance of a more sophisticated (market linked) side for the income approach. But in its essence, this choice is contradictory because the cost approach is more technical (surfaces, technical functionalities, and other engineering aspects), and therefore further away from the expertise typical for the

accounting profession. As such, we raise a red flag for auditors, for both approaches based on models, income as well as cost.

Estimation uncertainty is another feature of FV that has manifested in our study and which must be accepted. It can be counteracted, or its effects can be diminished, first and foremost by a Valuation report sufficiently well detailed as inputs (accurate as numerical expressions, characteristics as best described, source and risk of volatility shown). Secondly, we think about the applied methodology, of which we determined that the income approach versus the cost approach was less risky, but only when the internal control is strong and for the case of management estimation; and for the same scenarios, a strong internal control and for the management's estimation, we observed that the presence in the Valuation document of the valuation attributes and the reporting of outputs volatility is less risky than the presentation of the methods, assumptions and model used by the appraiser of FV. Once again, the valuation methodology appears to be a weakness for the auditors in terms of competencies.

In relation to management bias, we determined that auditors are aware of management subjectivism and the need to make a larger audit effort when the FV provider is internal and not external (but hired by the management). Through a more consistent verification effort, there are premises that management bias is easier to detect.

Professional skepticism can only be assumed in our investigation; it can possibly be indicated by the high level of mean values allocated to additional effort of auditor, often over 5 out of 7 on the Likert scale.

For standard guidance, we agree with the authors who claimed insufficient guidance in accounting and auditing standards. In addition, our descriptive statistics revealed a poor participation of auditors in trainings on FV subject matter.

We believe that our results contribute to the existing literature. Firstly, we address the incomplete understanding of the auditor facing the risk of management bias and bring some insights. Secondly, our study denotes a relatively poor understanding of the valuation process by the auditors. The claims for lack of sufficient expertise in financial areas in the particular case of developing countries, as shown in literature, for example Doliya & Singh (2016), are therefore confirmed for a part of the Romanian auditors, in terms of valuation issues. An explanation could be the poor guidance in the audit standards and particularly in the professional guides on valuation issues. This is also due to the call, still inconsistent, of estimating fair value in the

Romanian context. Thirdly, we offered some explanations pertaining to the inherent complexity and uncertainty of FV measurement in relation to other factors, for our case.

We signal also some limitations for our study that require further developments. Firstly, we are aware of the modest sample size, even in the case of the experiment, being hard to gather many participants. Then, we tested issues on the level 3 in the value hierarchy, and maybe the delimitation between the two valuation approaches (income and cost), both mark to model type of value estimation, was more difficult to observe by the auditors.

Chapter 5

5. A MODEL TO ASSESS THE RELATIONSHIP BETWEEN MANAGEMENT OPPORTUNISM AND AUDITOR REACTION. EMPIRICAL EVIDENCE FOR AN EUROPEAN CONTEXT

5.1 Research motivation

Over the last twenty years, maintaining the confidence in the financial system has proven to be an ongoing challenge for the actors involved. Beginning with financial scandals and continuing with issues that impacted the macroeconomic landscape (the Covid-19 pandemic, the geopolitical instability), the FRQ continues to be vulnerable. The first effect of the economic and political changes is the volatility and uncertainty of the market, hence, less and less predictability. However, the users of financial information still need predictability and have the same desire to be able to assess the quality of financial reporting (Zang, 2012; Lo, 2015). Regardless of the socio-economic and political context, users will still want to make relevant decisions based on the reporting quality. Nevertheless, we have to admit that, in general, an unpredictable environment and the market volatility give rise to serious challenges for management when making estimates. It is very clear that such periods involve more judgments given the increased level of estimation uncertainty.

Irrespective of the challenges in the economic environment, accounting estimates remain a challenge both for those who make them and for those who verify them, namely the auditors (Christensen et al. 2012; Bratten et al. 2013). As mentioned earlier in this research, one of our goals was to discuss the main risks related to the accounting estimates, the way auditors perceive these risks and how they react to management opportunism. Managers can take advantage of the uncertainty of estimates, which should trigger a reaction from the auditors. In this chapter this is exactly what we want to explore, the auditors' response to managers' opportunism but especially the reverse relation, in order to capture the managers' reaction to possible corrections requested by auditors.

In a latter publication, Deaconu et al.(2021a) express the same concerns related to the importance of understanding how the information disclosed can be biased due to the existence of accounting estimates and other disclosures (for example, the classification of elements in financial statements, the capitalization of expenditures), as well as elements of accounting reasoning and management discretion. The users of financial statements are impacted in terms of FRQ, but at the same extant the auditors. They need to be aware that there is a risk as regards the level of accuracy of the information disclosed by their clients. In addition, the auditors ensure the FRQ for the users.

Thus, our main concern- finding indicators of management bias related to the estimates- is justified by the recent literature that claims the need of such indicators for the auditors (PCAOB, 2011; Bratten et al., 2013; Abernathy et al. 2015). In the same time, the latest revision of IAASB and PCAOB in terms of improving the audit standards related to the accounting estimates, focused on the potential management bias associated with accounting estimates (IAASB, 2018; PCAOB, 2018). It should be noted that IAASB emphasizes the need to detect management bias indicators and gives auditors a direction when such indicators are identified (IAASB, 2018). This particular interest and a more specific guidance offered by the IAASB compared to PCAOB can also be found in the similarity and convergence analysis made by Ciurdas (2020).

Specifically, seeing this particular interest for management bias indicators related to the accounting estimates, in the literature and at the level of regulatory bodies, we want to address this topic in our exploratory study. We will emphasize the impact of financial restatements requested by auditors as corrections of material misstatements related to fair value and accounting estimates issues, in previous financial statements. We see these restatements as a consequence of management biased estimates, thus as a red flag for the auditors in terms of risk of misstatement.

The reasoning, as explained at the beginning of this research, is that the uncertainty of estimates facilitates management bias (Christensen et al., 2012; Bratten et al., 2013; Griffin, 2014; Glover et al., 2017; Oyewo et al. 2020). The role of auditors is to identify it and eventually to "sanction it" through the financial restatements. As a result, the restatements represent an indicator for the FRQ and an indicator of the management opportunism (Ettredge et al., 2010). Hence, our main goal is to go a step further to see if these restatements asked by the auditors can potentially attenuate opportunistic behavior associated to the estimates.

Therefore, we investigate the link between accounting estimates (with the related audit risks), financial restatements and the management opportunism assessed as earnings management. Considering our literature review in Chapter 2 and the results of previous researches (DeFond & Zhang, 2014; Velte, 2022), we found a gap in studies correlating financial restatements with earnings management and audit risk/accounting estimates. Usually, financial restatements are associated with FRQ and audit quality (Stanley & DeZoort, 2007; DeFond & Zhang, 2014; Sellers et al., 2020). Our aim is to examine whether restatements might diminish management opportunistic behavior in order to help auditors mitigate the audit risk related to accounting estimates, re-classifications, capitalizations/decapitalizations, and other accounting options and policies– all issues that are affected by management discretion. Thus, we will correlate the three

topics mentioned above to identify an indicator able to assist auditors when mitigating with the estimates' audit risks. Therefore, our main research question is: if auditors ask managers to restate their financial statements, are the managers less willing to resort to earnings management practices in the next period? A subsidiary question also arises from this: whether the companies in our sample engage in earnings management practices.

Our analysis is performed on a sample with 64 European companies, listed on U.S. stock exchange, from 2000 to 2017. Using Audit Analytics database (AA hereinafter), we selected for our sample only those companies having accounting estimates and other accounting options related restatements. We chose European companies firstly because evidence related on restatements is limited for Europe. Moreover, studies linking restatements with accounting estimates and earnings management for this context are scarce. However, we observed only those European firms indexed on the NYSE, since AA has very limited and recently issued data for Europe (AA, 2021). Secondly, our access was limited to a particular module in the AA database.

In a recent survey conducted by AICPA it is revealed that in 28% of cases the auditors were challenged when evaluating management's process for developing estimates and in 23% of cases it was a challenge for the auditors to determine whether assumptions used by management were reasonable (AICPA, 2021). We thus see that the audit of accounting estimates remains a burden on auditors, despite the efforts being made in recent years to improve the standards and to offer additional guidance to the auditors. For this reason we consider that the debate on audit risks on accounting estimates is still a pressing issue. The timeliness of the subject motivates our research to some extent; therefore we will try to contribute to this particular and interesting debate.

Our main contribution is related to the existence of managerial opportunism in this European context and the way managers react after a correction requested by the auditors for accounting estimates related issues. Through our study we provide empirical evidence on the relationship of accounting estimates, related restatements and earnings management. Furthermore, we offer additional evidence on the interaction between restatements and company size on discretionary accruals.

In the following sections we present a literature review related with our topics, we present the model and the sample, the results achieved and the conclusions of the study.

5.2 Analysis of the literature and hypothesis development

We started this research based on Staubus' (2000) theory on decision-usefulness of accounting, specifically, taking it as our theoretical basis related to financial reporting effects on users' decisions usefulness. Previous studies (Barron & Stuerke, 1998; Lee & Masulis, 2009) have focused on the extent to which the quality of the published accounting information influences users' decisions. We relate our study to this theoretical foundation, as we want to observe if it is possible to align managers' interests with those of auditors. We are aware that each category of users is interested in high quality financial reporting, but the managers' possibilities and incentives to be more subjective when dealing with judgments needed within the financial statements may burden auditors.

As discussed in the introductory section, we are interested on how reported accounting estimates facilitate an opportunistic behavior and the way auditors try to mitigate this issue. Therefore, given the research topic we are concerned with and the research question he have, we will focus on three major categories of studies. The first one relates to accounting estimates and audit risk, the second one to earnings management and the third to the link between restatements and earnings management.

The first group of literature addresses estimation uncertainty as an audit risk that may influence auditors' decisions to issue financial restatements. Being aware that we have already discussed this theme more in depth in the second chapter of this thesis, and tangentially in the other chapters, we will only recall the essential papers that refer to the audit risks related to the accounting estimates. In this respect, we recall the paper of Bratten et al. (2013) on the uncertainty of the estimates as an environmental factor that may have an impact on estimates measurement. One main consequence, as emphasized in Christensen et al. (2012) study, is the managers' incentives to bias those estimates. They may take advantage of the high uncertainty of reported estimates, providing auditors the chance to manifest their professional judgment at a deeper level. Given the high likelihood of the possible intentional biased estimates, the auditors may require adjustments. This matter is documented by Griffin (2014), who provides empirical evidence about how auditors make decisions related to fair value and other estimates' measurement uncertainty. The author asserts that auditors are most likely to require an adjustment for the estimates when both imprecision and subjectivity are high.

As summarized in Figure 8 in our literature review chapter (Chapter 2), the problems with auditing estimates relate to market uncertainty and sometimes the unavailability of observable input data. The consequence is the occurrence of managerial opportunism which entails a double

burden for auditors: the high degree of uncertainty inherent to the estimates and the risk that they may be intentionally or unintentionally biased (Christensen et al., 2012). Moreover, the effect of the estimates uncertainty is linked also to the materiality threshold (Christensen et al., 2012; Eilifsen et al., 2021). For the auditors, this complicates the process of reducing the audit risk, but, as stated by Eilifsen et al. (2021), it impacts also the FRQ and consequently the willingness of investors to invest. That's why there were studies (Christensen et al., 2012; Abernathy et al., 2015) that suggested potential revisions of the auditing standards, in order to clarify the auditor's responsibilities with respect to some estimates that contain extreme measurement uncertainty. For example, International Standard on Auditing (ISA) 700 (Revised), "Forming an Opinion and Reporting on Financial Statements", mention the necessity of having key audit matters (KAM) paragraph in the auditor's report (IFAC, 2015), as recommended by Christensen et al. (2012). Besides this, the recently revised audit standards on FV and accounting estimates emphasizes the need to detect management bias indicators and gives additional guidance and directions to the auditors when such indicators are identified (IAASB, 2018).

Hence, the conclusion of this brief literature review on our first topic is that numerous studies identified important consequences of the estimation uncertainty, especially for the auditors, as they have to identify the intentional or unintentional mislead manifested by those preparing the accounting estimates. We have seen that in addition to previous research, regulatory bodies have also made efforts to help auditors in this regard by improving on existing standards. So, all involved parties highlight the need for the auditors to be aware of the audit risks related to accounting estimates subject to uncertainty, professional accounting reasoning and management bias. Otherwise said, it is stressed the need for management bias indicators or red flags able to help auditors in relation to management's opportunistic behavior. In presence of challenging accounting estimates our research question relates to whether financial restatements, required by the auditors could be such an indicator, having the potential to reduce management opportunism.

The second group of literature review refers to discretionary accruals (abnormal accruals), as a measure used to disclose earnings management practices and to assess the FRQ. As stated by Muresan & Silaghi (2014), it is interesting to study since at international level returns vary from context to context as a result of different accruals measures and different accounting systems. We are aware about the multiple international differences in earnings management (related to the legal systems, the accounting system, the audit environment, the degree of exposure and development on capital market etc). Thus, previous studies have seriously discussed different models used to better detect earnings management (Prather-Kinsey & Waller Shelton, 2005; Tsipouridou & Spathis, 2014; Filip, et al., 2016).

Studies as Dechow & Dichev (2002); Chan, et al. (2004); Kothari, et al. (2005); Filip & Raffournier (2014) used discretionary accruals to assess the quality of financial reporting. Hence, abnormal accruals represent a unanimously accepted proxy for managers' opportunistic behavior reflected in the financial reporting. However, we are aware that there is no best method to estimate discretionary accruals, which is why we chose a proxy generally accepted as measure for earnings management, namely discretionary accruals.

Accruals assessment goal is to capture the relationship between the dimension of accruals and the measurements of abnormal accruals. Hence, extreme accruals imply extreme abnormal accruals (Dechow et al., 2010). If we refer to Jones model, discretionary accruals represent the residual part from the abnormal accruals models (Jones, 1991). For our study we chose modified Jones model developed by Dechow et al. (1995). As stated also by Deaconu et al. (2021a), "one of the reasons we chose this approach is because it is appropriate for cross-sectional testing by industry and year (Xie, 2001; Li et al., 2011), which is compatible with our sample's design. The initial Jones (1991) model considers accruals a function of revenue growth and depreciation of property, plant and equipment. The residuals are correlated with accruals, earnings and cash flow. The Jones model modified by Dechow et al. (1995) excludes growth in credit sales in the manipulation years'. The model relies on the relation between credit sales variation and earnings management. In the model design, abnormal accruals are the residuals and normal accruals are the difference between total and abnormal accruals. Aside from some weaknesses, our option is finally based on the popularity of the Jones model, considered to possess higher explanatory power of detecting earnings management than other models (Chan et al., 2004). The modified Jones model has even greater power of detection, according to its authors."

There are studies as those of Coppens & Peek (2005); Maijoor & Vanstraelen (2006); or Filip & Raffournier (2014) that found evidence for the European context of companies engaging in earnings management practices. Moreover, as indicated by the research of Beckmann, et al. (2019), for a sample of 1349 companies listed in the US, the cross listed companies engage in both real and accrual earnings management. Therefore, the findings on our second category of research papers inspire and encourage our subsidiary research question, whether the companies in our sample engage in earnings management practices.

The third subject associated with our debate relates to financial restatements. This topic came rather naturally, as our main objective is to investigate whether managers manipulate earnings and whether the auditor's reaction to management opportunism affects the trend of earnings management practices. Hence, the auditors' response to the manager's speculation on the

estimates' uncertainty are the financial restatements required to the audited company. Thereby we justify the third category of literature review related to restatements. For the model we propose financial restatement is our main independent variable, through which we try to answer the research questions and test our hypotheses.

Once again, we are aware that restatements were a proxy for both the audit quality and FRQ (Reynolds & Francis, 2000; Larcker & Richardson, 2004; DeFond, 2010). Likewise, a recent study (Rajgopal et al., 2021), that seeks to validate the most popular proxies for audit quality, found evidence that of all proxies, restatements are the most reliable, predicting the maximum audit deficiencies. Besides the Rajgopal et al. (2021) paper that we find interesting in terms of predictive power of audit quality proxies we cite also DeFond & Zhang (2014), who produced a valuable review of previous research on items related to the FRQ and audit quality. Sievers & Sofilkanitsch's (2018) working paper deserves to be mentioned as it provided us a significant help with our research. They carried out a comprehensive overview on literature related to the causes and effects of restatements. Nevertheless, we are aware that there are not many studies that have directly addressed the link between restatements and earnings management. We mention Ettredge et al. (2010), who found evidence of increasing use of earnings management prior to restatement. We cite also the studies of Cunha et al. (2017) and Deaconu et al. (2021a), that have similar objectives with our own research even if for different contexts, namely to investigate the link between earnings management and restatements.

Generally, auditors initiate restatements when they discover misstatements in financial statements during their mission. Our choice to link accounting estimates related restatements with earnings management is based on AA reports for 2018 and 2021. They reveal in the restatement frequency analysis that for the last thirteen years in top seven accounting issues include: debt, quasi-debt, warrants issues; revenue recognition issues or liabilities, payables, reserves and accruals estimate failures (AA, 2017; AA, 2020). All these restatements issues often include estimates that require significant judgment from those responsible to prepare financial statements. As mentioned in the introduction, the AICPA survey revealed that auditors are still challenged when evaluating management's process for developing estimates (AICPA, 2021). Thus, we considered necessary an analysis of restatements related only on estimates issues.

The decision to issue restatements is a joint effort between auditors, managers and audit committees, which evaluate the nature and materiality of misstatements, considering the errors' materiality. Then, they make a decision on whether to waive or make corrections to the financial

statements. After the restatement announcement is made, the previously issued financial statements are amended for the periods affected.

Therefore, our exploratory study links estimates related restatements to earnings management (measured by discretionary accruals), adding other control variables that can induce a specific direction to earnings management.

Therefore, we conclude this section, with our research hypotheses: (1) for the European setting, managers manipulate earnings (2) and the auditors' requirements for accounting estimates related restatements reduce management bias, revealing a decrease in earnings management practices.

5.3 Research methodology

5.3.1 The model design

As mentioned in the previous section, with the model we propose we want to capture the relationship between the manager's opportunism and the auditor's reaction. Manager's opportunism will be measured using earnings management proxy and the auditor's reaction through the existence of financial restatements. Given our interest in accounting estimates and audit risks, we selected only those companies that presented financial restatements linked to accounting estimates, re-classifications, capitalizations/decapitalizations, and other accounting options and policies (Appendix 6). To quantify the management opportunism we chose discretionary accruals as a proxy for earnings management techniques.

Therefore, with the model we propose we want to detect the existence of management bias and whether the auditors' reaction to ask for financial restatements could discourage earnings management in the following period. For doing this, we use modified Jones model (Dechow et al., 1995) to capture the existence of discretionary accruals, known as proxy for earnings management and hence managers' opportunism. Even if we are aware that there are many other models in order to detect earnings management occurrence, we chose the one developed by Dechow et al. (1995) because, as stated before, is consistent with our cross-sectional sample design (Li et al. 2011).

In our multivariate model the abnormal accruals that are a measure for earnings management represent our dependent variable. Then, in order to observe the correlation between management opportunism and the auditor's reaction, we use restatements requested for material accounting misstatements as our main independent variable. The other variables used in the model are

control variables that could have an impact on earnings management. We describe all these variables in the next paragraphs and also in Table 5.1. The model we used is inspired by Vander et al. (2003) study and then adapted to our research questions.

$$DAC_{absit+1} = \beta_0 + \beta_1 \times REST_{it} + \beta_3 CS_{it} + \beta_2 \times RESTCS_{it} + \beta_4 \times LEV_{it+1} + \beta_6 \times INVTAN_{it+1} + \beta_5 \times AUDITROT_{it+1} + \beta_6 \times BIG4_{it+1} + \varepsilon$$

Where,

DACABS - absolute value of discretionary accruals computed as residuals,

REST - restatement of the financial statements requested by the auditor due to material misstatements

CS - company size

RESTCS - interaction variable between REST and CS

LEV - leverage ratio

INVTAN - net investments in tangible assets

AUDITROT - audit firm rotation

BIG4 - if the auditor is a Big4 or not

DAC indicates the presence of discretionary accruals, more specifically, the presence of earnings management techniques. In order to estimate DAC we looked at the residuals in the equation, where total accruals (Acc) are calculated in two ways (1 and 2 in Table 1). We ran the regression to predict total accruals and then the estimated error term (ε), which is equal to discretionary accruals.

We would like to point out that, as stated also in previous research (Warfield et al., 1995; Maijor, & Vanstraelen, 2006) the absolute value of discretionary accruals is a good proxy for the combined effect of income-increasing and income-decreasing earnings management decisions. Otherwise said, this allows us to capture managers' attempts to manipulate earnings in both directions. Moreover, in our hypothesis we are not interested to predict a given direction for the earnings management, we are interested only on how restatements for accounting estimates issues change the manipulation trend, regardless of whether it is upward or downward.

As indicated above, our explanatory variable is REST. It measures the auditor's reaction to manager's opportunistic behavior, by asking financial restatements in a certain year. The AA database that we used to obtain restatements information provides these data in two ways: as qualitative and technical restatements. The qualitative restatements have a material impact on net income, on earnings per share, and shareholders' equity. The technical restatements have a zero

cumulative net impact, but they imply modifications of accounting policies, corrections of misclassifications, or corrections of certain errors that are still worth looking into and understanding them. AA indicates also whether the financial statements are affected by Big R restatements or little r restatements. We talk about Big R restatements if it is a matter of financial statements reissuance for a material error "that calls for the complete withdrawal and republishing of past financial statements" and a SEC 8-K reporting (AA, 2018). The other category, the little r, are errors that are not material for previous financial statements but could be material in the current period and do not require a SEC 8-K filing (Tan & Young, 2015). Furthermore, AA provides also information about the positive or negative effect of the restatements on cumulative change in net income and cumulative change in stockholder equity for the qualitative restatements. Given the way AA database provides the restatements, but also the lack of information for each category, we decided to create REST as a dummy variable, noting if the restatements were required or not for a certain company-year.

We introduced in our model company size (CS) based on its effect on DAC, as argued in previous studies (Watts & Zimmerman, 1990; Myers et al., 2003; Wuryani, 2012; Cassell et al., 2014). Then, we created an interaction variable between restatements and company size to control if the effect of restatements on DAC depends on another variable as the company size.

The other variables, LEV, INVTAN, AUDITROT, BIG4, are control variables that could have an impact on DAC if we follow the earnings management literature (Myers et al., 2003; Francis & Yu, 2009; Chen et al., 2014; Tan & Young, 2014; Garcia et al., 2020).

As regards LEV, previous studies show contradictory results as for the impact of leverage on earnings management (Vander et al., 2003; Zamri et al., 2013; Lazzem & Jilani, 2018). In Tan & Young (2014) research, leverage had also been associated with the probability of a company to restate its financial statements. We chose to calculate leverage as ratio of debts to total assets, as in previous studies (Dichev & Skinner, 2002; Ettredge et al., 2010; Zamri et al., 2013). The other continuous variable, INVTAN, represents the investments in tangible assets and is inspired by Vander et al. (2003) study, but we adapted it to the information we had available from our companies' financial statements (see Table 5.1).

Table 5. 1 Specifications of the model variables

Variables	Analysis elements within the variable	Type of variable
Independent variables		
REST - financial restatements requested by the auditor due to misstatements in the financial statements	1 if the company operated a restatement in the year T, 0 otherwise	Dummy
CS - company size	Measured as natural logarithm of the company's total assets	Continuous
RESTCS	Interaction variable between REST and Company size	Continuous
LEV - leverage ratio for the auditee*	Ratio of debt over total assets	Continuous
INVTAN – net investments in tangible assets for the auditee*	Changes in tangible assets from the previous year, scaled by lagged total assets	Continuous
AUDITROT*,- auditor rotation	1 if the company had a new/another auditor, 0 otherwise	Dummy
BIG4*,- Big4 audit firm	1 if audited by a BIG4, 0 otherwise	Dummy
Dependent variable		
DAC - discretionary accruals computed as residuals(ϵ)*	$Acc = \alpha + \beta_1(\Delta REV - \Delta REC) + \beta_2 PPE + \epsilon \quad (1)$ <p>All variables are deflated by lagged total assets.</p> <p>REV - change in sales revenue REC - change in accounts receivable PPE - property, plant, equipment Acc - total accruals Acc = Net income – Cash flow from operations (2)</p>	Continuous

Note. *Variables's value in T+1;

When it comes to the model's logic (Figure 12) we want to clarify how we see the relationship between our dependent variable, namely DAC and the explanatory one, REST. Given the nature of accounting estimates there is a high likelihood for the opportunistic behavior and so, they represent an additional burden for the auditor. We started from the idea that when the auditor detects earnings management techniques, he reacts by means of the required financial

restatements. We are aware of the reciprocity that could be established between earnings management and restatements (restatements affecting earnings management, and earnings management affecting restatements). Thus, we shifted the values of variables in time, in order to counteract the effect of endogeneity and to advocate for our model philosophy, that in T+1 following the financial restatements, the management opportunism decreases. Hence, REST, CS and RESTCS variables keep the values in T and DAC with the other control variables take the T+1 values.

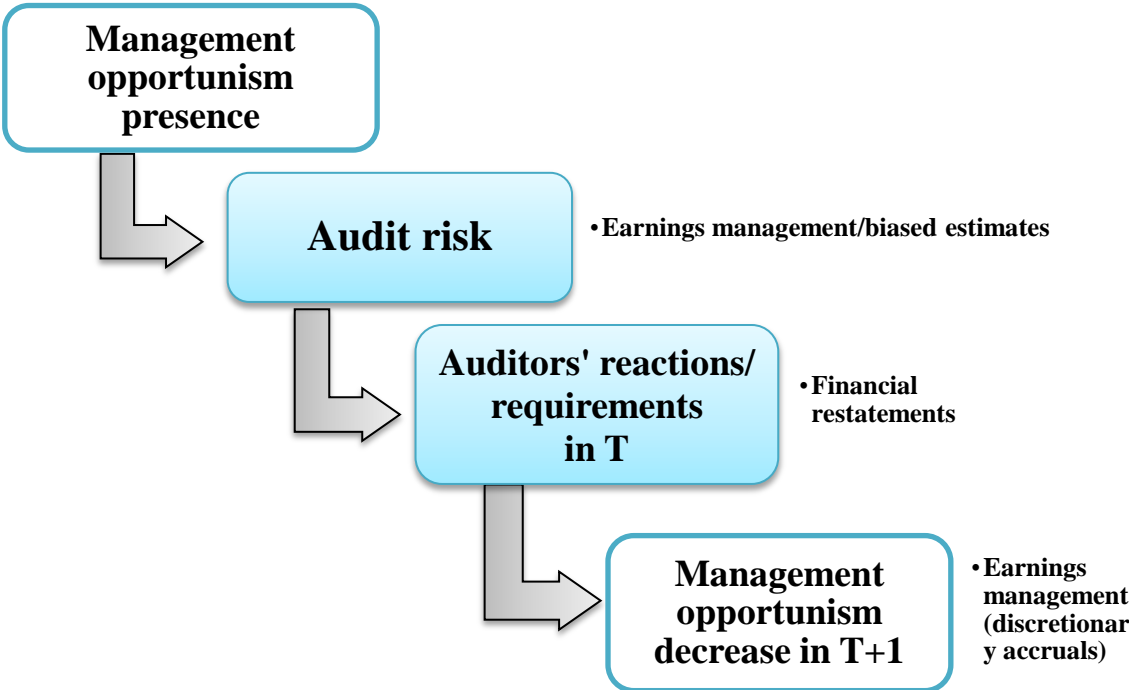


Figure 12. The model philosophy, Source: Deaconu et al., (2021a)

5.3.2 The sample

Our sample consists of European companies listed on NYSE that disclosed accounting estimates related restatements from 2000 to 2017. To collect data for this study we used AA database especially for restatements issues and Thomson Reuters Eikon for the other variables (financial and non-financial information). At the time we accessed AA database, we were able to cover 18 years, period for which we had available information on financial restatements for European companies listed in the U.S. market. As noted in previous studies (Coffee, 2005) financial restatements are more unusual for the Europe compared to U.S., which is why our analysis focuses on this sample of European companies publicly traded on the NYSE. Though, as already mentioned in earlier research (Coffee, 2005; Soltani, 2014), the European firms cross-listed in the U.S. were more likely to have similar crises of earnings management as the famous financial scandals in the American context.

We would also like to highlight that AA has released only two years ago Europe Financial Restatements database for the European companies listed on EEA markets (AA, 2020). So our analysis is not suitable for companies on European stock exchanges, as it is limited both in terms of the period for collecting information on restatements (since January 2018) and in terms of the total number of restatements (as we are interested only in a certain category).

Our final sample contains 1152 observations of 64 firms, from 2000 to 2017. In our initial selection process we had 245 European companies that issued at least one restatement between 2000 and 2017. After the first analysis of the sample we kept only those companies that had financial restatements due to accounting estimates. After this selection we kept 125 companies. In order to keep only accounting estimates-related restatements we relied on AA’s taxonomy or coding that allowed us the research and selection of what was of interest to us. It is worth mentioning that this limited selection is due to our very specific research topic. Concretely, we used the topical keys provided by AA for the reasons behind the restatements to ensure that only related accounting estimates, re-classifications and other accounting options issues were selected.

Consistent with previous studies, financial institutions with SIC codes from 6000 to 6999 were excluded, leaving us with 104 firms. The last sample modification is related to the availability of financial data for our companies in the Thomson Reuters database. Consequently, we excluded companies for which we could not find the financial statements in Eikon database nor on their website, which were delisted or which were part of the same group already included in the sample. Thus, the final sample consists of 64 companies that had at least for one year an accounting estimates-related restatement, between 2000 and 2017 (See Table 5.2).

Table 5. 2 Sample selection criteria

Description	Number	
	Companies	Observations
• Total of initial companies with at least one restatement between 2000-2017	245	4410
• Except: - <i>Companies with accounting estimates <u>non-related</u> restatements</i>	120	2160
- <i>Companies categorized with SIC 6 code</i>	21	378

- Companies without available financial statements information in Thomson Reuters	40	720
• Total of observations selected sample	64	1152

According to the statistical analysis of our sample, companies from United Kingdom, Netherlands and Ireland hold the top three positions with the highest number of companies that have had financial restatements between 2000 and 2017 (see Figure 13). The same direction can be observed when analyzing the number of financial restatements out of the total number of restatements that have been requested during the 18 years under analysis (see Figure 14). Furthermore, the analysis of our sample revealed that more than 50% of all restatements requested by auditors over the 18 years took place between 2000 and 2009, namely 73%. Since 2006 the number of such issues has started to decrease, excepting 2014, when a rise of accounting estimates-related restatements could be observed. This is consistent with Tan & Young (2015) study that noticed a decline of restatement announcements reported in SEC Form 8-K filing. They stressed the fact that companies avoided amending their financial statements, revising only the affected numbers for the previous periods in subsequent quarterly or annual reports (little r restatements).

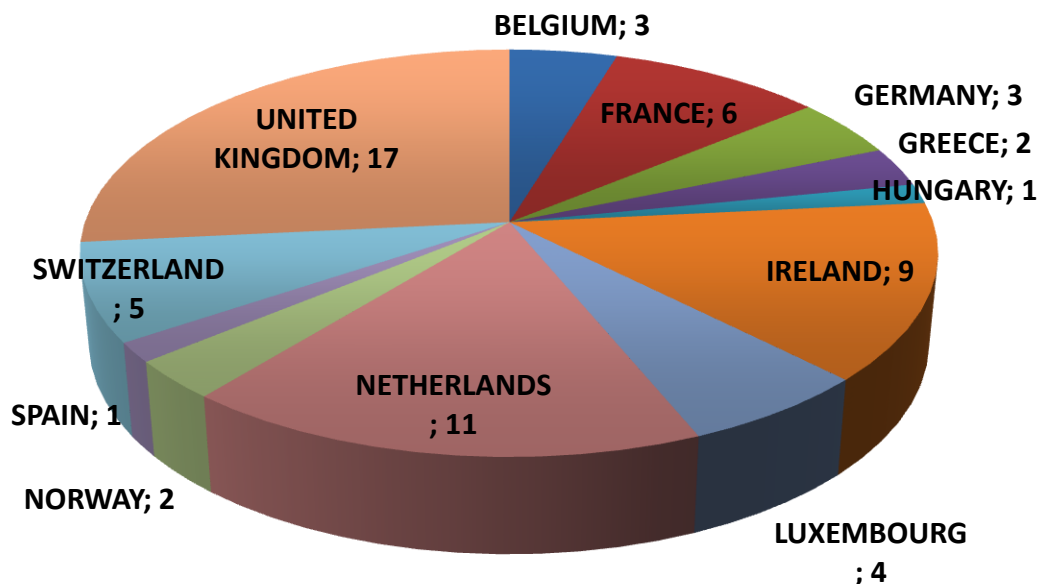


Figure 13. Sample distribution by country

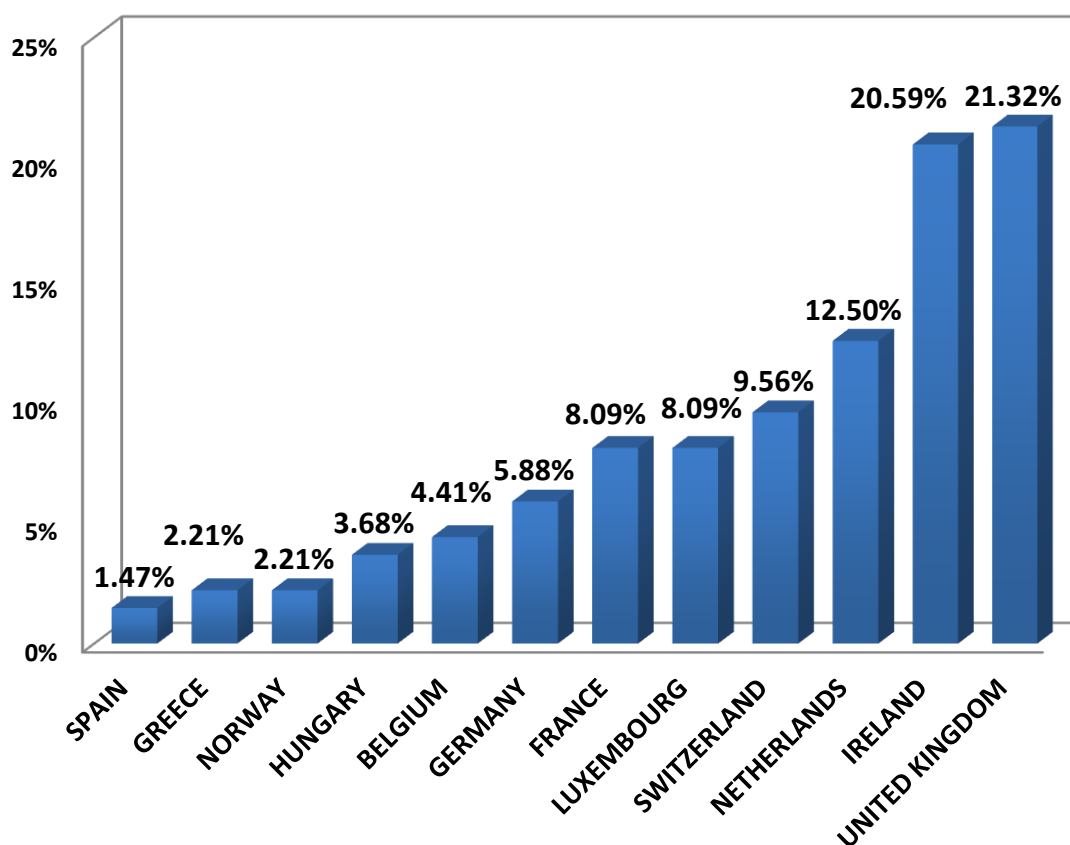


Figure 14. Percentage of restatements by country

The decline of financial restatements observed within our sample is confirmed by AA's analysis published in the last years' reports (AA, 2017; AA, 2020). They revealed a drop with 81% in the number of companies reporting financial restatements, in 2020 compared to 2006 (AA, 2020). A possible explanation could be the IFRS implementation from 2010, which could have positively influenced opportunistic behavior in financial reporting.

On the other hand, it is worth noting that in the latest AA report, the revenue recognition was the number one accounting issue in financial restatements, cited for the last three years. Therefore, our concern for audit risks related to accounting estimates can be justified, as revenue recognition is one of the items that leave enough room for subjectivity and judgments. Even if it has been observed an increase in the level of convergence degree between accounting estimates and fair value audit standards, there is still enough space for additional auditor guidance when it comes to red flags and indicators for biased estimates (Curdas, 2020). Moreover, the same AA report from 2020 revealed cash flow classification issues and liability and accrual recognition as being the next in the restatement issues ranking. Hence, the study we propose, on REST cases related to estimates and re-classifications issues is in line with the top 5 recent financial restatements issues.

5.4 Results and discussion

5.4.1 Descriptive statistics and preliminary tests

We begin our analysis with some descriptive statistics for the variables in our model. In Table 5.3 we present the descriptive statistics for our continuous variables, namely DACABS as the dependent variable and LEV, INVTAN, CS and RESTCS as control variables.

Table 5. 3 Descriptive statistics for continuous variables (n=744, 832, 782, 833, 833)

Variable	Minimum	Maximum	Mean	Std. Deviation
DACABS	0.0001502	84.95505	1.101656	4.050585
LEV	-0.86	404	2.114712	17.08981
INVTAN	-7.5	40.9	0.1247954	1.718501
CS	2.302585	21.9798	14.18472	3.469698
RESTCS	0	19.29825	2.189565	3.033847

Note. * Where DACABS –absolute value of discretionary accruals, INVTAN – changes in tangible assets from the previous year, LEV – leverage ratio, CS- company size, RESTCS- interaction variable (RESTxCS)

** Due to lack of data, we could not measure the variables, for all years. This explains the difference in number of observations between the variables

As already mentioned, we used discretionary accruals (known also under the name of abnormal accruals) as a measure for earnings management. Table 5.3 offers us an overview on the magnitude of abnormal accruals in the case of European companies listed on NYSE, from 2000 to 2017. The statistical analysis (Table A-5.1, Appendix 5) transposed in Figure 15, clearly suggests that the highest level of earnings management was in 2006, year when the number of restatements from our analysis started to decrease. From Table 5.3 we can also observe a higher standard deviation level for the LEV variable that suggests a lower level of homogeneity for the companies in our sample. We examined the data, trying to explain these phenomena, and we noticed a very low level of total assets in certain years, which led to higher values for LEV among certain companies.

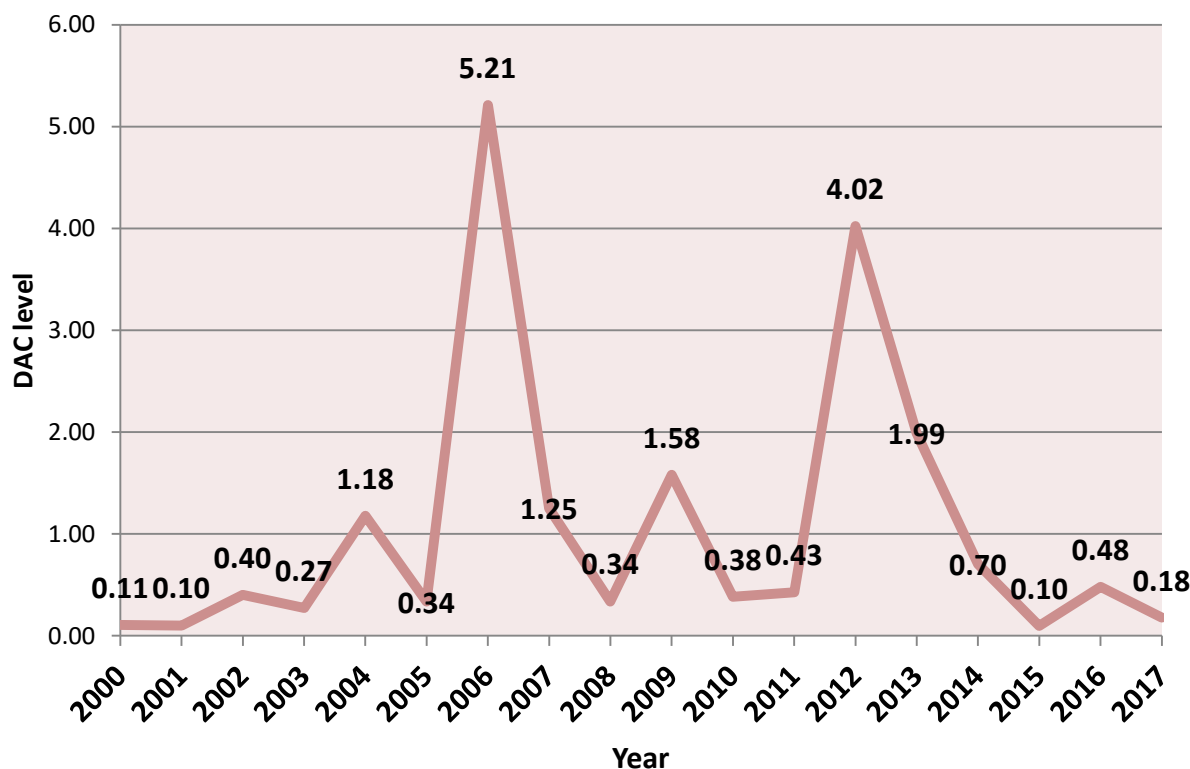


Figure 15. Earnings management trend, 2000-2017

Furthermore, in Table 5.4 we provide data for our independent dummy variables, namely REST, BIG4 and AUDITROT. It can be noticed that the majority of our companies chose a Big4 auditor, with a percentage of 80.23% from the total available observations. On the other side, auditor rotation from a year to another was not very frequent within our sample, suggesting longer auditor tenure. This is not necessarily a bad thing as suggested in previous studies (Cassell et al., 2014; Garcia et al., 2020). For our main independent variable REST we observe that during this period for all the companies, the presence of such an event is rarer, which is normal and understandable.

Table 5. 4 Frequencies for the independent dummy variables

Variable (n=1152)	Frequency (%)	Variable (n=860)	Frequency (%)	Variable (n=860)	Frequency (%)
REST		BIG4		AUDITROT	
0	88.19	0	19.77	0	90.70
1	11.81	1	80.23	1	9.30

Note. Where REST – restatements required (1 for the event occurrence); BIG4 – 1 if audited by BIG4, 0 otherwise, AUDITROT – auditor change from one year to another (1 yes, 0 no)

Pearson correlation coefficients were used to examine the relationship between the continuous variables (Table 5.5). We performed also Spearman correlation test for the dummy variable, which shows similar results.

Table 5.5 Pearson correlation matrix

	DACABS	REST	CS	RESTCS	LEV	INVTAN	BIG4	AUDITROT
DACABS	1.0000							
REST	-0.0307 (0.3933)	1.0000						
CS	-0.2537* (0.0000)	0.0079 (0.8192)	1.0000					
RESTCS	-0.0427 (0.2397)	0.9610* (0.0000)	0.1254* (0.0003)	1.0000				
LEV	0.0399 (0.2681)	0.0295 (0.3953)	-0.2284* (0.0000)	-0.0198 (0.5787)	1.0000			
INVTAN	-0.0110 (0.7622)	-0.0257 (0.4725)	-0.0211 (0.5590)	-0.0256 (0.4789)	-0.0510 (0.1548)	1.0000		
BIG4	-0.2036* (0.0000)	0.0154 (0.6520)	0.7091* (0.0000)	0.0861* (0.0153)	-0.1900* (0.0000)	-0.0082 (0.8188)	1.0000	
AUDITROT	0.0911* (0.0116)	0.0202 (0.5540)	-0.1381* (0.0001)	-0.0133 (0.7093)	0.1664* (0.0000)	-0.0188 (0.6009)	-0.1325 * (0.0001)	1.0000

Variable definitions: DACABS –absolute value of discretionary accruals, INVTAN – changes in tangible assets, LEV – leverage ratio, CS- company size, RESTCS- interaction variable (RESTxCS), REST – restatements required, BIG4 –if audited by BIG4, AUDITROT– auditor change from one year to another

The correlation matrix shows that there are several statistically significant correlations between some of the explanatory variables. Further, we performed variation inflation factors test (VIF) to see the degree of correlation between variables. As we expected, the results revealed multicollinearity only in the case of REST and the interaction term RESTCS, with values bigger than 5. For the other variables the VIF test showed values very close to 1. We are aware of the high amounts of multicollinearity that interaction terms could generate, but we want to keep it, as it could provide crucial information about the relationships between our dependent and independent variables.

In order to preserve the power of the model and the correct interpretation of the coefficients we decided to fix the multicollinearity problem in our data, even if there are voices in the econometric field saying that "the fact that some or all predictor variables are correlated among themselves does not, in general, inhibit our ability to obtain a good fit nor does it tend to affect inferences about mean responses or predictions of new observations" (Netter et al., 2004, p.289).

Therefore, given that the interaction term is responsible for the high VIFs, we remove the structural multicollinearity by centering our continuous company size variable (CS). In this way, we managed to considerably reduce the values of the VIF test, around 2 for CS and around 1 for the others (See Table A- 5.2; Table A- 5.3; Appendix 5).

Before the regression, we complete another set of tests, namely the unit roots test. We applied Fisher test (Choi, 2001), with D. Fuller and P. Perron options, appropriate for our data, without lags and with one lag. The overall results of the tests show that all our continuous variables are stationary, excluding any unit root (Table 5.6).

Table 5. 6 Stationarity analysis

<i>Test/ Variable</i>	<i>D.Fuller</i>	<i>P.Perron</i>
<i>Fisher (no lags)</i>	<i>p-value</i>	<i>p-value</i>
DACABS	0.000	0.000
LEV	0.000	0.000
INVTAN	0.001	0.000
CS	0.001	0.001
<i>Fisher (one lag)</i>		
DAC	0.002	0.000
LEV	0.029	0.000
INVTAN	0.000	0.000
CS	0.000	0.000

Note. *The null hypothesis is that all the panels contain a unit root

5.4.2 Regression analysis

In order to test our hypothesis we performed a pooled OLS regression, for DAC as endogenous variable, computed as the absolute value of discretionary accruals, and REST/RESTCS as main explanatory variables. The results are presented in Table 5.7 bellow.

Since abnormal accruals were different from zero, we consider earnings manipulation to be present for the European setting analyzed. This validate our first hypothesize and creates the premise for proceeding with our econometric analysis, in order to determine the impact of financial restatements from T on the intention to manipulate earnings in T+1.

Therefore, regarding the main explanatory variable REST, it seems to be correlated with DACABS, for the levels of statistical significance indicated. We also observe a negative correlation with the dependent variable. We can translate it as a decrease of managerial opportunism in the year following the restatements. Hence, our second hypothesis is validated, as the auditors' decision to issue restatements diminish the willingness of manipulation. This is consistent with another study we performed (Deaconu et al., 2021a) with a similar statistical model, but for the Brazilian context. Thus, for European companies, we observe the same impact of accounting estimates related restatements on managers' opportunism in general.

We are aware that accounting estimates related restatements were not necessarily explored in previous research and we have scarce evidence on this rather narrow and specific topic. Anyway, there are other studies that found evidence related to the relationship between earnings management and restatements in general. The results of Elshafie & Nyadroh (2014) show a significant positive relationship between discretionary accruals and audit quality measured by the likelihood of restatements of the financial statements.

Table 5. 7 Model coefficients ^a

Model	B	Std. Error	z	p-value
(Constant)	1.189	0.609	1.95	0.051
REST	-0.666	0.386	-1.73	0.084*
RESTCS	0.417	0.113	3.70	0.000***
CS	-0.497	0.090	-5.52	0.000***
INVTAN	-0.055	0.080	-0.68	0.497
LEV	-0.012	0.009	-1.31	0.189
AUDITROT	1.025	0.514	1.99	0.046**
BIG4	0.025	0.646	0.04	0.969

Note. a. Dependent Variable: DACABS; b. ***p<0.01, ** p<0.05, *p<0.1
R²=0.2177, prob>chi2 = 0.000

For the company size variable the results show that larger companies engage significantly less in earnings management according to beta coefficients and p value ($p = 0.000$, $b = -0.497$), which is consistent with previous literature (Myers et al., 2003; Maijoor, & Vanstraelen, 2006; Wuryani, 2012). As for our interaction term RESTCS, we observe that is significantly influencing DACABS ($p = 0.000$). This confirms our decision to include the interaction between the existence of restatements and the firm size, as the association between the two explains DACABS and gives us an additional outcome. Given the positive coefficient ($b = 417$) we deduce that larger companies with restatements in T continue to increase the discretionary behavior in T+1. The accounting estimates related restatements seem not to decrease the managers' opportunism in the following period for our European sample, in the case of larger companies.

INVTAN does not appear to be correlated with discretionary accruals as we expected, as investments may impact accruals due to the higher associated depreciation expense (Vander et al., 2003). There is no correlation either between LEV and DACABS, result consistent with previous studies that used a similar or identical proxy for discretionary accruals (Vander et al., 2003; Jones et al., 2006). While auditor rotation it has a correlation with earnings management practices as stressed also by Myers et al. (2003), the BIG4 seems to not necessarily mitigate earnings management incentives for our sample.

Further, to test the robustness of our results we continued our econometric testing with fixed effects and random effects. The outcome of these models is presented in Table 5.8 and Table 5.9 and is consistent with our initial regression analysis results. According to the results of Hausman test we performed ($p = 0.0085$), we reject the null hypothesis for a $p < 0.1$ (see Table A- 5.4, Appendix 5). Thus, the fixed effects model is appropriate. However, the overall results are robust.

Table 5. 8 Model coefficients for fixed effects ^a

Model	B	Std. Error	t	p-value
(Constant)	1.202	0.670	1.79	0.073
REST	-0.797	0.396	-2.01	0.044**
RESTCS	0.527	0.118	4.46	0.000***
CS	-0.781	0.183	-4.27	0.000***
INVTAN	-0.061	0.081	-0.76	0.450
LEV	-0.012	0.009	-1.32	0.189
AUDITROT	1.022	0.520	1.97	0.050*
BIG4	0.174	0.771	0.23	0.822

Note. a. Dependent Variable: DACABS; b. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
 $R^2 = 0.2256$, $\text{prob} > F = 0.000$

Table 5. 9 Model coefficients for random effects ^a

Model	B	Std. Error	z	p-value
(Constant)	1.189	0.609	1.95	0.051
REST	-0.666	0.386	-1.73	0.084*
RESTCS	0.417	0.113	3.70	0.000***
CS	-0.497	0.090	-5.52	0.000***
INVTAN	-0.055	0.080	-0.68	0.497
LEV	-0.012	0.009	-1.31	0.189
AUDITROT	1.025	0.514	1.99	0.046**
BIG4	0.025	0.646	0.04	0.969

Note. a. Dependent Variable: DACABS; b. ***p<0.01, ** p<0.05, *p<0.1
R²=0.2177, prob >chi2 =0.000

The second robustness test was to test our regression model using the signed discretionary accruals variable (See Table A- 5.5, Appendix 5). The overall results showed robust results, with a greater correlation of restatements for the fixed effects model ($p = 0.064$), meaning that the restatements' influence on managerial opportunism is mediated by firm specific factors.

5.5 Conclusions of the study

The aim of this study was to investigate a rather narrow subject, specifically the effects of auditors' reaction on the management opportunistic behavior. The particularity of the study and the model we propose comes from the fact that we are interested only in accounting estimates issues when it comes to auditors' reaction and their ability to represent a warning flag for the estimation uncertainty issues. We are aware that financial restatements requested by auditors are a response whenever they identify such problems. However, we are interested by the effect of these auditor responses on the financial statements in the upcoming periods.

Therefore, through the model we designed we examine whether financial restatements would diminish the audit risks related to estimations and other accounting professional judgments by reducing management bias in the forthcoming period. Previous studies (DeFond & Zhang, 2014; DeFond, 2010) linked restatements with audit quality, but more importantly, they have been tested and validated by Rajgopal et al. (2021) as the most consistent proxy to represent audit deficiencies.

Our results provide evidence about the effect of restatements on earnings management practices and hence on the FRQ. The results on our model identified earnings management practices for a sample of European companies listed on NYSE. Hence we validate our first research hypothesis, which is a prerequisite for our second research question. We contribute to the international debate on earnings management considering the evidence on accruals anomalies in the U.S. capital market for companies located outside U.S. The presence of earnings management is

confirmed based on a new version, self-designed model for the discretionary accruals. We created this model inspired by Vander et al. (2003), introducing control variables supported by previous literature (Myers et al., 2003; Francis & Yu, 2009; Chen et al., 2014; Tan & Young, 2014; Garcia et al., 2020). Thus, we contribute also on the literature studies about discretionary accruals used as a measure of earnings management.

Besides the users of accounting information which are directly interested about FRQ, the auditors are impacted too in terms of audit risk assessment. Thus, the econometric treatments revealed a negative correlation between restatements asked by auditors for accounting estimates issues (including re-classifications, capitalizations/decapitalizations, and other accounting options and policies) and discretionary accruals. Our second research hypothesis is validated by this result, as our intention was to examine whether restatements in one year would decrease the managers' opportunistic behavior in the next period. Previous literature found some evidence on the connection between restatements and discretionary accruals. For example, our previous study based on a very similar model (Deaconu et al., 2021) confirms the negative association between financial restatements in one year and the earnings management from the next period, for a sample of Brazilian companies listed on U.S. stock market. Elshafie & Nyadroh (2014) found a positive correlation between DAC and audit quality measured by the likelihood of the restatement of the financial statements. They used restatements as a depended variable and DAC as the explanatory. The positive association they found is normal, as they linked the variables in the same year. If we think about it, it is a simultaneity bias, as it is normal to have restatements when earnings management practices are identified during the same period. The link between restatements and earnings management was confirmed also by Cunha et al. (2017), but still for Brazilian companies. Another research that linked discretionary accruals with restatements for U.S. firms is Herly et al. (2020). They found evidence of poor quality of earnings before a restatement event and an improvement for the quality of earnings for the restaters after the restatement event. This support the negative association we found between REST and DAC.

Therefore, our study contributes to the existing literature on accounting estimates, audit risks, restatements and earnings management, by providing results about the reaction of firms with estimates related restatements. Furthermore, through our research questions and findings, we aimed to provide a contribution relevant for the current debate on the challenges for the auditors when evaluating management's process for developing estimates (Christensen et al., 2012; Griffin, 2014; AICPA, 2021). Our study is an attempt to provide indicators useful for the auditors when dealing with accounting estimates risks, as claimed by previous authors (Christensen et al. 2012, Abernathy et al. 2015). The results we provided show that financial

restatements are a potential factor for decreasing opportunistic behavior in subsequent periods, but only if they are not related to the company size.

Our research and the results provided are subject to some limitation. First, our regression model implemented here is exploratory; being only suggestive to what types of factors could impact the earnings management. There could be other variables included in the model that we have not been able to identify. Second, we acknowledge that there are inherent limitations regarding to what a small sample can reveal. At the same time, we realize that we are constrained by this small number of observations because these events are not or are not likely to be very frequent. Moreover we selected only those cases of accounting estimates related restatements, as we were interested only in audit risk that the uncertainty of estimates could induce. As stated before by Palmrose et al. (2004) or Herly et al. (2020) this selection bias could be one of the most important limitations. Hence, finding a convincing sample to detect earnings management for companies with estimates related restatements is difficult. So, in these cases, the tests may not be powerful enough to detect the existence of opportunism and the exact correlation of the auditor's response with those earnings management.

Future research could also look on a larger sample if possible and even on a comparison with the European firms listed on Europe's financial markets. It would be interesting to identify differences between them, regarding earnings management practices and their reaction to the financial restatements as a response to accounting estimates issues. Likewise, other proxy for the discretionary accruals could be tested. We find interesting as a future suggestion an analysis with a greater lead in time, between the restatement event and the potential earnings management practices for the next years.

6. CONCLUSIONS

Key findings

Here we are at the end of a research trip, which I would dare to say is actually only the beginning of the exploration of this subject for us. We were inspired in our approach by the visible effort of the other researchers in the field, both at the theoretical and empirical level. We have been aware from the beginning that the contribution we could make is dedicated to a limited category of professionals in the field, but the global efforts of researchers can only together add real value to science, which is a cumulative progress, and less individual.

Based on these considerations, and given the continuous debate related to the challenging character of accounting estimates for all the actors involved, we considered that many aspects still need to be elucidated and understood in more depth, especially with respect to the audit of accounting estimates. Indeed, a deeper understanding of the audit risks related on estimates is a topic of interest not only for academia, but also for auditors, managers, investors, decision-making and regulatory bodies and other interested parties.

Our thesis explores the audit risks and challenges for the auditors, in terms of verifying the accounting estimates in general and FV measurements in particular. It comprises five chapters, the first and the second ones introducing accounting estimates and presenting a literature survey and each of the next three provide an empirical essay, which address different topics identified previously.

The **first chapter** is designed in order to introduce the readers the accounting estimates as an important and debatable topic. This is a chapter that we considered important at the beginning, because it gives the necessary background to the readers, so that they understand what accounting estimates are, why they present risks and for whom. In addition, we have also wanted to provide some background on one of the most challenging estimates, namely fair value, since it is a subject that we will discuss later in one of the essays. Besides the background on accounting estimates, the way they operate and their impact on financial reports, we have brought in this chapter some recent insights on the regulations regarding accounting estimates and fair value, as well as the latest changes announced and still under debate. So, from the first chapter, whose aim was to create the necessary background, we have highlighted the challenges of accounting estimates, the topicality of the subject, and the ongoing joint effort of regulators, professionals and practitioners. They all have a common interest in bringing new perspectives to alleviate the challenges of accounting estimates and their audit.

In the **second chapter**, in order to identify the current state of knowledge in the field of auditing accounting estimates, we conducted a quantitative analysis on a sample of articles which we further studied from a qualitative point of view. This allowed us to group them into research directions. These lines of enquiry that we have drawn up around the articles selected from the sample are the ones that have been the basis for our studies in this thesis. Hence, this second essay contributes to the literature, by underlying the key factors that imply a risk for the auditors when verifying how the accounting estimates were made by those in charge. First, the quantitative analysis of the articles selected in our sample revealed an increasing trend manifested among researchers, regarding the interest in this subject. Second, we observed through this analysis some research directions and themes of interest for the academic and professional environment. The estimation uncertainty and complexity, the management bias, the professional skepticism, the use of a third party specialist, the litigation consequences associated with the quality of the audit, were all topics that we have identified and discussed within this chapter. According to previous research, earnings manipulation (management bias), the difficulty to test inputs resulting from judgments and assumptions (information relevance for FV), and estimation uncertainty are the main challenges for the auditors.

Thus, we provided an overview of the current perception on the audit of accounting estimates and related risks. In addition, we linked the factors affecting the quality of audit judgments as: environmental factors, task factors and auditor-specific factors already discussed by Bonner, (2008) and Bratten et al. (2013) and identified the gap where we could bring our contribution. Given the estimation uncertainty risks, the common conclusion of the studies we discussed was the need for more indicators for management bias. Moreover, in their attempt to reduce estimation uncertainty, auditors seek for advice to third party specialists. This emphasis on coping estimation uncertainty and management bias through more professional skepticism, the use of external specialists (for making or verifying estimates) and the management bias indicators are the directions we identified for possible future evidence.

The **third chapter** aim was to determine the degree of convergence between the two audit referential for accounting estimates, the American one- AS 2501, and the international one- ISA 540. It was a study we conducted immediately after the revision initiated by the two regulatory bodies, PCAOB and IAASB. We found, as we expected, a higher degree of convergence between the two referential, and an improvement of ISA 540 revised compared to the old version. Through this study, we were interested in the extent to which the regulatory bodies have addressed the problems identified previously by researchers and professionals in the field. We identified and compared the new approaches of the revised standards in three general directions:

general aspects and fair value treatment, risks of estimates and risk approaches, the use of experts and use of external sources of information. These themes were of interest for us, as we wanted to address the impact of the use of an external specialist on the auditors' risk perception and the management bias indicators within our two others essays. The results of the similarity and dissimilarity coefficients we employed stressed the effort of the regulatory bodies to reduce audit risk and the struggle for the auditors when verifying accounting estimates (including fair value). We observed that the revised standards respond to specific requests made in previous research and focuses auditors on the estimates with greater risk of misstatement and prompts them to devote more attention to addressing potential management bias. These efforts and the effects of a higher degree of convergence represent the prerequisite for higher quality audit missions as claimed by all the actors involved. As mentioned at the beginning of this thesis, the regulatory and oversight bodies are constantly monitoring the updated auditing standards for accounting estimates and their implementation. Recently, IFAC issued an implementation tool to assist auditors in implementing ISA 540 Revised (IFAC, 2022) and PCAOB initiated a request for comments on the initial impact of the new requirements for auditing accounting estimates and using the work of specialists (PCAOB, 2022). We concluded that the constant effort of supervision, improvement and convergence between standards, as well as the close collaboration of stakeholders, are the combination of factors needed to overcome the challenges of accounting estimates.

The **fourth chapter** focuses on the influential factors, the fair value estimate provider and the valuation process conducted to estimate the FV (FV measurement and FV disclosure) in relation with the auditor's likelihood to develop additional effort to further investigate the FV estimate and the perceived risk of misstatement. We address a gap in the literature by describing and statistically analysing the auditors reaction related to FV estimation process for a sample of 76 auditors through an experiment previously tested on 160 students. Specifically, we judge if the choices concerning FV estimate provider, and also the type and content of the documents disclosed either by an internal valuator or the external expert, can reduce or multiply the effects of uncertainty, complexity and management bias. These issues are reflected by the level of risk of misstatement that participants will assess in the magnitude of risk of misstatement that the participants will assess and the additional time and effort required to investigate FV measurement and disclosure.

The results of the experiment revealed for 3 from 4 of our cases the preference for an external valuator. It appears that the auditors discern between FV providers only in the case of the application of the cost approach in the valuation report, preferring the external valuator to the

internal one (management estimation). This is confirmed for the scenario of a high internal control quality. Contrary to our expectations, the tests showed that the auditors believe they would make more effort when verifying cost approach instead of income approach, when FV is a management' estimate.

We brought our contribution by analysing the auditor-specific factors directly related to fair value estimation and that we believe having the potential to enhance the audit quality and minimize the specific risks, for an emergent context. Moreover, we correlated them with other influential factors appearing in the researchers' recent frameworks, as fair value complexity, estimation uncertainty, managerial bias of professional scepticism. We addressed the incomplete understanding of the auditors facing the risk of management bias and bring some insights. Secondly, our study denotes a relatively poor understanding of the valuation process by the auditors and the lack of insufficient expertise in financial areas for the particular case of developing countries, in line with previous research.

The **fifth chapter** arises also from the findings of the literature review which claimed the need for management bias indicators. We are interested in the way in which accounting estimates facilitate opportunistic behavior and how auditors try to mitigate this problem. Therefore, with the model we proposed we wanted to detect the existence of management bias and whether the auditors' reaction to ask for financial restatements could discourage earnings management in the following period. The econometric tests were performed on a sample of 1152 observations, for 64 European companies listed on NYSE.

We contribute to the international debate on earnings management considering the evidence on accruals anomalies in the U.S. capital market for companies located outside U.S. We have also observed a negative correlation between that can be translated as a decrease of managerial opportunism in the year following the restatements. Furthermore, we offer additional evidence on the interaction between restatements and company size on discretionary accruals.

In this vein, there are many implications of these results for the main relevant players. Given the negative correlation between restatements and management bias evidence, we can state that companies with a tendency to manipulate can be "tamed" by increased auditor attention to accounting estimates and possible restatements to be asked. In addition to auditors and managers (or companies themselves), there are other stakeholders for whom these results may be of interest. By this we mean investors, who could thus pay more attention to the financial results and their ability to reflect the undistorted reality in the years immediately following the financial

restatements required by the auditors. We are aware that our results have shown reduced earnings management only in the years immediately following the estimates issues related restatements. Anyway, for potential investment opportunities, the causes of the restatements are a warning flag also for the actual and future shareholders. In this context, an effort from an important stakeholder, namely the government, is expected, in order to create a stable business environment, so as to avoid contributing to even more manipulation by companies' management, especially in the context of accounting estimates that depend so much on external inputs. Naturally, through these results, we also wanted to draw the attention of regulatory bodies, which have a lot to say when it comes to dealing with accounting estimates.

This thesis offered new empirical evidence and insights on a topical issue, but at the same time, a challenging one, namely the audit risks related to accounting estimates and FV measurements. However, given that they require significant judgment in an environment with pressure to keep up with the changing times, the results should not be seen as definitive results, but more as an effort to understand this issue from the auditors' perspective.

Research limitations and future research avenues

As in any scientific endeavour there are also research limitations, which we have been constantly aware of, during the whole research process.

Certainly, our literature review could be redesigned into a meta-analysis to better assess the literature in the field and provide measurable findings regarding the factors affecting the audit of estimates and the appropriate instruments to cope with the associated risks. This literature analysis could be done also for different environments, in order to see specific patterns regarding the accounting estimates related audit risks for different financial markets or different industries. Another limitation is linked to the subjectivism that underpinned the selection of the research directions resulting from the literature review for our three essays. Of course, we had to choose those research directions that could be explored with the means and resources at our disposal.

First, for the study on the convergence degree of audit standards, the main limitation identified is related to the specific topics we selected in order to compare and assess the referential evolution. We did not analyse the convergence of the three standards as a whole. Therefore, a comprehensive examination, considering all aspects set out in the standards for auditing estimates, could have been considered.

Second, for our second empirical research, the experiment seeking answer for the auditors' risk and effort assessment related to the factors having the potential to enhance the audit quality and minimize the specific risks, the first limitation is the limited sample size. We were aware that in the case of the experiment it could be challenging to gather many participants especially for the emerging financial environments. It would be quite insightful to extend this experiment involving more participants in order to increase the statistical relevance. Then, we tested issues on the level 3 in the value hierarchy, and maybe the delimitation between the two valuation approaches (income and cost), both mark to model type of value estimation, was more difficult to observe by the auditors. In the case of an experiment involving more participants, it would be interesting to consider another category of accounting estimates.

Third, for the last empirical essay, an important limitation is the sample size, according to the requirements of discretionary accruals models. However, we kept in mind that our aim was to test the model for the existence of financial restatements, which are specific and quite rare events. Furthermore, we have designed the model focusing only on the restatements related to accounting estimates issues, so that we can answer to our research question and to follow our research interests. All this had an important contribution on limiting the sample we had to work with. Another limitation identified in this study relates to the exploratory nature of the model, so there may be other influencing factors or variables that we did not include or failed to identify. We could have also selected other proxies in order to detect the existence of opportunism, but this may remain as a possible future research direction. We also consider applying in the future the model to sub-samples of countries, or industries, but only if additional data can be obtained to increase the sample to be statistically relevant. As a future research direction we intend to include other measures or characteristics of the financial result, not just earnings management.

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Links

- <https://www.auditanalytics.com/>
- <http://www.scimagojr.com> SCImago, SJR — SCImago Journal & Country Rank [Portal]

APPENDIX

Appendix 1

Table A- 3.1 Elements analysis and comparison for ISA 540 and AS 2501

	ANALYSIS THEME	ANALYSIS ELEMENT OF THE THEME	AUDITING REFERENTIALS		
			<i>Old ISA 540</i>	<i>ISA 540 REVISED & ISA 500 amendments</i>	<i>AS2501 REVISED & AS 1105 amendments</i>
Section A	General aspects and fair value treatment				
	A1	General aspects			
	A1.1	The existence of a single standard on auditing accounting estimates including fair value	yes	yes	yes
	A2	Fair value aspects			
	A2.1	Including fair value in the title of the analyzed auditing standard	yes	no	yes
	A2.2	Existence of a separate section dedicated to fair value	yes	no	yes
Section B	Risks of estimates and risk approaches				
	B1	Management bias			
	B1.1	Indicators for management bias	yes	yes	no
	B2	<i>Mentioning a risk-based approach to auditing estimates</i>	yes	yes	yes
	B2.1	separate assessment of control risk for accounting estimates	no	yes	no
	B2.2	separate assessment of inherent risk for accounting estimates	no	yes	no
	B3	<i>Inherent risk factors specific to accounting estimates</i>			
	B3.1	Estimation uncertainty	yes	yes	yes
	B3.2	Complexity	no	yes	yes
	B3.3	Subjectivity	no	yes	yes
	B3.4	Other factors	no	yes	yes
	B4	More emphasis on exercising professional skepticism	no	yes	yes

Section C	<i>Use of experts and use of external sources of information</i>				
	C1	Further clarifications for the use of external sources for obtaining information by companies	no	yes	yes
	C2	Differentiation between the external source and the management expert	yes	yes	yes
	C3	Use of <i>external sources of information</i> (1) vs pricing / non-pricing sources (third parties) (0)	yes	yes	no
	C4	Considering non-pricing information as external sources	no	yes	no
	C5	Using manager expert (1) vs company specialist (0)	yes	yes	no
	C6	Clarifications for assessing / evaluating the relevance and reliability of information from external sources used as audit evidence	no	yes	yes
	C7	An external source can become the manager's expert for a different set of information	no	yes	no
	C8	Less information / evidence required when there are different sources of information for estimates if there is a consensus between them	no	yes	yes
	C9	Establishing factors that affect the relevance and reliability of tests from external sources	no	yes	yes

Appendix 2

Excerpt from the case material (for the cell E/a)

1) BACKGROUND

Stela Ionescu, financial auditor, just arrived at the office of VIITORUL, a joint-stock company that owns industrial type properties. It was February 2019 and Stela had the task of verifying the values of the assets reported in the financial statements at the end of 2018 for VIITORUL. In particular, the present case focuses on one of the constructions of VIITORUL, Construction 1 (for simplification, we have eliminated the valuation of the related land) for which Stela verifies the estimation at fair value, realized by revaluation, according to IAS 16.

2) INFORMATION CONCERNING FAIR VALUE AT DECEMBER 31, 2018

Stela received from the executive director of VIITORUL a valuation report of an external consultant regarding the value of the Construction 1. The estimate was classified as Level 3 (IFRS 13).

The details of the valuation performed by the external valuator, contained in the Valuation Document (Valuation Report), are given in the Case Material which follows.

3) ELEMENTS TO BE OBTAINED BY THE AUDITOR ON THE ESTIMATION

The estimation of the fair value was made by an external valuator of VIITORUL, as it appears from the Case Material - Valuation Report.

Suggestions on the elements to be observed in the Valuation Report:

- If the quantitative and qualitative attributes relevant for the evaluation are presented;
- The extent to which these relevant attributes were based on observable/ available data;

....

4) INFORMATION ON INTERNAL CONTROL

Before deciding on the risk of estimating fair value, Stela integrates the conclusions of the entire audit team regarding the internal control of VIITORUL. The evaluation of internal control based on the specific stages of the audit leads to the idea that it is low level.

5) CONCLUSIONS ON THE ESTIMATION OF THE VALUE

Stela expresses its conclusions regarding the risk of estimating the value for its audit mission. To do this, she makes two observations and uses the Likert scale to position her opinion.

A. Likelihood that the auditor (Stela) will make additional efforts to verify in more detail how to estimate fair value

1	2	3	4	5	6	7

Where 1 - very low likelihood of making extra effort; 7 - very high likelihood of making extra effort

B. Higher risk of misstatement in FR estimation made by the auditor (Stela)

1	2	3	4	5	6	7

Where 1 - very low likelihood of estimation risk occurrence; 7 - very high likelihood of estimation risk occurring

Appendix 3

Excerpt from the manipulation checks

Preliminary case study⁸

Recognize, according to the descriptions below, without making any calculation, for the Ski Unit (Level.....), and then for the Accommodation Unit (Level), the fair value levels, according to the IFRS 13 hierarchy. Then indicate for each Unit the source of the estimate: Ski Unit - source; Accommodation Unit - source ...

<i>Value levels</i>	<i>Source of estimation</i>
<i>Level 1</i> Market comparisons with identical assets Market approach from the valuation methodology	<i>Internal</i> Data provided by the company: management/ specialized personnel
<i>Level 2</i> Market comparisons with similar assets Market approach from the valuation methodology	<i>External</i> Data provided by an external source/ cons
<i>Level 3</i>	

Stela Ionescu, chief accountant for GROUP BETA was sent in July 20X8 to the offices of GAMMA, one of GAMMA's subsidiaries. Although GAMMA seemed a promising acquisition two years ago, the below average snowfall and the current crisis in the real estate market have seriously affected the initial successful projections. As a result, Stela's mission was to evaluate assets to detect potential impairment. GAMMA activities are divided into two Units: Ski and Accommodation. Each Unit represents a separate business, so that the cash flows of each are largely independent of the other Units. Stela will then determine the fair value for each Unit. The Ski Unit earns revenue from the sale of lift tickets and other services, such as ski and snowboard

lessons, equipment rentals and other recreational activities. Stela consulted with a local valuator who told her that, although there are no business units identical to the GAMMA ski resort, two other very similar ski areas were sold in the last year. Stela will use these sales to calculate a multiple (applied to sales revenue) and estimate the value of GAMMA's Ski Unit. Comparable sales are: Piatra Craiului Mountain, which generated average annual sales revenue of \$ 6,500,000, was sold for \$ 11,375,000; and Predeal Resort, which generated average annual sales revenue of \$ 13,000,000, was sold for \$ 22,750,000. GAMMA generated average annual sales revenue of \$ 5,500,000.

The Accommodation Unit

⁸Adapted from: Gore & Herz (2010)

Appendix 4

Excerpt from the robustness test

Table A- 4. 1 Univariate analysis – with ‘A higher risk of misstatement of FV estimation’ as dependent variable

Independent variables	Sum of squares	df	F	p-value
FV provider	4.051	1	2.185	0.150
FV measurement	0.071	1	0.038	0.847
Internal control	28.135	1	15.176	0.001*
FV provider x FV measurement	6.475	1	3.492	0.071***
FV provider x Internal control	1.635	1	0.882	0.355
FV measurement x Internal control	2.269	1	1.224	0.277
FV provider x FV measurement x Internal control	6.346	1	3.423	0.074***
Error	55.617	30		
<i>R Squared = 0.462; Adjusted R Squared = 0.336</i>				
FV provider	5.009	1	2.752	0.108
FV disclosure	0.055	1	0.030	0.863
Internal control	11.230	1	6.170	0.019**
FV provider x FV disclosure	2.239	1	1.230	0.277
FV provider x Internal control	0.019	1	0.010	0.920
FV disclosure x Internal control	5.462	1	3.001	0.094***
FV provider x FV disclosure x Internal control	0.012	1	0.007	0.935
Error	52.783	29		
<i>R Squared = 0.337; Adjusted R Squared = 0.176</i>				

*Significant at 1%, **significant at 5%, ***Significant at 10%.

Table A- 4. 2 Means and simple effects for ‘A higher risk of misstatement of FV estimation’

Panel A – related to FV measurement – when internal control is weak

FV provider			
FV measurement	Use of a valuation external expert	Management’s estimation	Test of simple effects
Income approach	5.17 ^a (0.477) ^b n=6	5.40 (0.510) n=5	F=0.096 p=0.761
Cost approach	4.75 ^a (0.250) ^b n=4	5.00 (0.775) n=5	F=0.090 p=0.768
Test of simple effects	F=0.269 p=0.611	F=0.258 p=0.618	

^a - mean; ^b - standard error

Panel B – related to FV measurement – when internal control is strong

FV provider			
FV measurement	Use of a valuation external expert	Management’s estimation	Test of simple effects
Income approach	3.33 ^a (0.615) ^b n=6	2.75 (0.750) n=4	F=.371 p=.552
Cost approach	2.25 ^a (0.250) ^b n=4	5.00 (1.00) n=4	F=6.868 p=0.020**
Test of simple effects	F=1.279 p=0.277	F=4.597 p=0.050**	

^a - mean; ^b - standard error

Panel C – related to FV disclosure – when internal control is weak

FV provider			
FV disclosure	Use of a valuation external expert	Management's estimation	Test of simple effects
Valuation attributes and sensitivity of data	4.67 ^a (0.760) ^b n=6	5.00 (0.707) n=5	F=0.156 p=0.699
Methods, assumptions and model	3.33 ^a (0.333) ^b n=3	4.60 (0.245) n=5	F=1.545 p=0.233
Test of simple effects	F=1.826 p=0.197	F=0.205 p=0.657	

^a - mean; ^b - standard error

Panel D – related to FV disclosure – when internal control is strong

FV provider			
FV disclosure	Use of a valuation external expert	Management's estimation	Test of simple effects
Valuation attributes and sensitivity of data	2.83 ^a (0.307) ^b n=6	3.00 (0.707) n=4	F=0.040 p=0.845
Methods, assumptions and model	3.00 ^a (0.408) ^b n=4	4.25 (1.031) n=4	F=1.855 p=0.195
Test of simple effects	F=0.040 p=0.845	F=1.855 p=0.195	

^a - mean; ^b - standard error

**Significant at 5%.

Appendix 5

Table A- 5. 1 Descriptive statistics for discretionary accruals by year

Year	Mean	Std. Deviation	N	Minimum	Maximum
2000	.1056793	.1312314	38	.0044334	.7686498
2001	.1008445	.1560965	38	.0006578	.7923262
2002	.4026321	1.009682	42	.0120893	6.728135
2003	.2742796	.704091	44	.0049677	3.607703
2004	1.178848	2.794193	43	.0038107	18.67675
2005	.3369568	.6276636	43	.0085225	3.810254
2006	5.211216	6.152541	44	.02804	31.67255
2007	1.251503	2.514575	46	.0316775	17.00259
2008	.3362253	.5123312	46	.0011575	3.37107
2009	1.579281	4.561427	44	.0140813	3.70146
2010	.3834884	.7103864	44	.0001502	4.677549
2011	.4264537	.7047197	46	.0061629	3.860695
2012	4.023669	12.2896	46	.8302166	84.95505
2013	1.990379	4.749602	49	.038088	32.53561
2014	.7030843	.5424176	42	.0140349	2.186559
2015	.0964824	.1385464	41	.000885	.8361011
2016	.479494	.5587424	41	.0163492	3.041781
2017	.1785409	.2724573	37	.001251	1.475611
Total	1.101656	4.050585	774	.0001502	84.95505

Table A- 5. 2 VIF test before centring the variables

Variables	VIF	1/VIF
RESTCS	5.97	0.167585
REST	5.72	0.174934
CS	2.24	0.446781
BIG4	1.95	0.513160
LEV	1.06	0.940689
AUDITROT	1.05	0.956282
INVTAN	1.01	0.993410
Mean VIF	2.71	

Table A- 5. 3 VIF test after centring the variables

Variables	VIF	1/VIF
CS	2.24	0.446750
BIG4	1.95	0.513165
RESTCS	1.24	0.804013
LEV	1.06	0.940690
AUDITROT	1.05	0.956280
REST	1.01	0.992755
INVTAN	1.01	0.993416
Mean VIF	1.36	

Table A- 5. 4 Hausman test results

	Coefficients			sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re	(b-B) Difference	
REST	-.7969783	-.6660384	-.1309398	.0864948
CS	-.7808744	-.4973172	-.2835572	.1592807
RESTCS	.5267274	.4174051	.1093223	.0345537
LEV	-.0123708	-.0117565	-.0006143	.0028484
INVTAN	-.0610632	-.0546355	-.0064277	.007709
AUDITROT	1.022158	1.024693	-.002535	.0767133
BIG4	.1736331	.0247484	.1488847	.4208812

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(7) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\ &= 18.91 \end{aligned}$$

$$\text{Prob}>\text{chi2} = 0.0085$$

Table A- 5. 5 Model coefficients for signed DAC regression, with fixed effects^a

Model	B	Std. Error	z	p-value
(Constant)	0.264	0.689	0.38	0.702
REST	0.756	0.407	1.86	0.064*
RESTCS	-0.487	0.121	-4.01	0.000***
CS	0.568	0.188	3.02	0.003**
INVTAN	0.017	0.083	0.21	0.835
LEV	0.013	0.009	1.39	0.164
AUDITROT	-1.595	0.535	-2.98	0.003**
BIG4	-0.452	0.794	-0.57	0.569

Note. a. Dependent Variable: DACSIGNED; b. ***p<0.01, ** p<0.05, *p<0.1
R²=0.142, prob>F = 0.000

Appendix 6

Table A- 6. 1 Audit Analytics’ taxonomy for accounting estimates related restatements

Accounting Rule Application Failures Financial Fraud, Irregularities and Misrepresentations Errors - Accounting and Clerical Applications Other Significant Issues
Acquisitions, mergers, disposals, re-org acct issues Acquisitions, mergers, only (subcategory) acct issues
Acquisitions, mergers, disposals, re-org acct issues Consolidation issues incl Fin 46 variable interest & off-B/S
Acquisitions, mergers, disposals, re-org acct issues Consolidation issues incl Fin 46 variable interest & off-B/S Acquisitions, mergers, only (subcategory) acct issues
Acquisitions, mergers, disposals, re-org acct issues Consolidation issues incl Fin 46 variable interest & off-B/S Cash flow statement (SFAS 95) classification errors Consolidation, foreign currency/inflation (subcategory) issue
Acquisitions, mergers, disposals, re-org acct issues Consolidation issues incl Fin 46 variable interest & off-B/S Consolidation, foreign currency/inflation (subcategory) issue
Acquisitions, mergers, disposals, re-org acct issues Deferred, stock-based and/or executive comp issues Capitalization of expenditures issues Acquisitions, mergers, only (subcategory) acct issues
Acquisitions, mergers, disposals, re-org acct issues Deferred, stock-based and/or executive comp issues Comprehensive income issues Acquisitions, mergers, only (subcategory) acct issues
Acquisitions, mergers, disposals, re-org acct issues Gain or loss recognition issues
Acquisitions, mergers, disposals, re-org acct issues Intercompany, investment in subs./affiliate issues Intercompany, only, (subcategory) - accounting issues
Acquisitions, mergers, disposals, re-org acct issues Liabilities, payables, reserves and accrual estimate failures Acquisitions, mergers, only (subcategory) acct issues
Acquisitions, mergers, disposals, re-org acct issues Tax expense/benefit/deferral/other (FAS 109) issues
Acquisitions, mergers, disposals, re-org acct issues Tax expense/benefit/deferral/other (FAS 109) issues Cash flow statement (SFAS 95) classification errors
Acquisitions, mergers, disposals, re-org acct issues Tax expense/benefit/deferral/other (FAS 109) issues Gain or loss recognition issues Acquisitions, mergers, only (subcategory) acct issues
Debt, quasi-debt, warrants & equity (BCF) security issues
Debt, quasi-debt, warrants & equity (BCF) security issues Acquisitions, mergers, disposals, re-org acct issues
Debt, quasi-debt, warrants & equity (BCF) security issues Balance sheet classification of assets issues
Debt, quasi-debt, warrants & equity (BCF) security issues Capitalization of expenditures issues
Debt, quasi-debt, warrants & equity (BCF) security issues Comprehensive income issues
Debt, quasi-debt, warrants & equity (BCF) security issues Consolidation issues incl Fin 46 variable interest & off-B/S Intercompany, investment in subs./affiliate issues
Debt, quasi-debt, warrants & equity (BCF) security issues Debt and/or equity classification issues
Debt, quasi-debt, warrants & equity (BCF) security issues Expense (payroll, SGA, other) recording issues
Debt, quasi-debt, warrants & equity (BCF) security issues Expense (payroll, SGA, other) recording issues EPS, ratio and classification of income statement issues Deferred, stock-based and/or executive comp issues
Debt, quasi-debt, warrants & equity (BCF) security issues Expense (payroll, SGA, other) recording issues Liabilities, payables, reserves and accrual estimate failures
Debt, quasi-debt, warrants & equity (BCF) security issues Expense (payroll, SGA, other) recording issues Liabilities, payables, reserves and accrual estimate failures Accounts/loans receivable, investments & cash issues Deferred, stock-based and/or executive comp issues
Debt, quasi-debt, warrants & equity (BCF) security issues Fin Statement, footnote & segment disclosure issues

Debt, quasi-debt, warrants & equity (BCF) security issues Foreign, related party, affiliated, or subsidiary issues Cash flow statement (SFAS 95) classification errors Comprehensive income issues Foreign, subsidiary only issues (subcategory)
Debt, quasi-debt, warrants & equity (BCF) security issues Foreign, related party, affiliated, or subsidiary issues Cash flow statement (SFAS 95) classification errors Foreign, subsidiary only issues (subcategory)
Debt, quasi-debt, warrants & equity (BCF) security issues Foreign, related party, affiliated, or subsidiary issues Cash flow statement (SFAS 95) classification errors Intercompany, investment in subs./affiliate issues Intercompany, only, (subcategory) - accounting issues Foreign, subsidiary only issues (subcategory)
Debt, quasi-debt, warrants & equity (BCF) security issues Foreign, related party, affiliated, or subsidiary issues Consolidation issues incl Fin 46 variable interest & off-B/S Cash flow statement (SFAS 95) classification errors Foreign, subsidiary only issues (subcategory)
Debt, quasi-debt, warrants & equity (BCF) security issues Foreign, related party, affiliated, or subsidiary issues Consolidation issues incl Fin 46 variable interest & off-B/S Consolidation, foreign currency/inflation (subcategory) issue
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Debt, quasi-debt, warrants & equity (BCF) security issues Foreign, related party, affiliated, or subsidiary issues Y - Registration/security (incl debt) issuance issues Debt and/or equity classification issues
Debt, quasi-debt, warrants & equity (BCF) security issues Liabilities, payables, reserves and accrual estimate failures
Debt, quasi-debt, warrants & equity (BCF) security issues Revenue recognition issues
Debt, quasi-debt, warrants & equity (BCF) security issues Revenue recognition issues Expense (payroll, SGA, other) recording issues
Debt, quasi-debt, warrants & equity (BCF) security issues Tax expense/benefit/deferral/other (FAS 109) issues
Depreciation, depletion or amortization errors Debt, quasi-debt, warrants & equity (BCF) security issues Revenue recognition issues Expense (payroll, SGA, other) recording issues Deferred, stock-based and/or executive comp issues Inventory, vendor and/or cost of sales issues
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Financial derivatives/hedging (FAS 133) acct issues Intercompany, investment in subs./affiliate issues Intercompany, only, (subcategory) - accounting issues
Financial derivatives/hedging (FAS 133) acct issues Liabilities, payables, reserves and accrual estimate failures Debt and/or equity classification issues
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Inventory, vendor and/or cost of sales issues
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Liabilities, payables, reserves and accrual estimate failures Accounts/loans receivable, investments & cash issues Debt and/or equity classification issues Balance sheet classification of assets issues
Liabilities, payables, reserves and accrual estimate failures GAAP - Changes in Acct Principles FASB/EITF or Foreign GAAP Retrospective revisions to p/y financials for consistency
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