
Measurement of Convergence Degree between International and US Auditing Standards for Accounting Estimates

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Abstract

Through this study, the author 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. The results of the statistical tests show an increase in the level of convergence between the two referential (ISA 540 & AS 2501) and an improvement of the new ISA 540 compared to the old standard. This analysis demonstrates the similarity between the risk approaches specific to the estimates for the two measures, but also the existence of differences regarding the fair value and the use of external sources by the management or the auditor.

Keywords: *audit, accounting estimates, fair value, ISA 540, AS 2501*

JEL Classification: *M41, M42, R32, G12*

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1. Introduction

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 fair value (hereafter 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 (Christensen et al., 2012; Fairclough, 2012; Bratten et al., 2013) and also notified by regulatory bodies.

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 standards¹ 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).

¹ AS 2501, AS 2502 and AS 2503

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.

Through this study, 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. In this paper, 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 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 empirical part of this article 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 article is structured as follows: section no.2 – review of the literature and correlation of this analysis with the content of standards and working documents; section no. 3 – research methodology and details on the statistically processed database, section 4 – the results of the statistical analysis, and the last part – the conclusions of the study.

2. Analysis of the literature

As I mentioned above, one of the most important challenges for the auditors is when they have to audit complex accounting estimates (Griffith et al., 2015; 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 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.

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 old 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).

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.

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 firms¹ 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 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, being 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. Research methodology

3.1. 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

¹ BDO USA, LLP; Crowe Horwath LLP; Deloitte & Touche LLP; Ernst & Young LLP; Grant Thornton LLP; KPMG LLP; PricewaterhouseCoopers, LLP; RSM US LLP

auditing standards – ISA540 and AS2501. We chose the two referential because they both include in a single standard all accounting estimates, including fair value. Therefore, at the international level, we have analyzed ISA 540 Auditing accounting estimates, including fair value accounting estimates and related disclosures, and the new ISA540 (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) 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.

As a comparison, the analyzed American standard was the new revised AS 2501 Auditing Accounting Estimates, Including Fair Value Measurements. We made a content analysis of the three referential in order to identify and to measure the elements mentioned in the previous section. 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. 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 and Tanimoto (1960); Sokal and Sneath (1963) and for dissimilarity the Euclidean Distance.

4. Results and discussions

4.1. Global convergence degree analysis

In **Table no.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); following 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 confirms the robustness of the results.

Table no.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.

4.2. The degree of convergence analysis for the analyzed topics

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 no. 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.

In terms of specific audit risks for the estimates notified by the standards (**Table no. 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 no. 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.

Table no. 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/AS2501_R
Simple Matching ^a	0.333	0.667	0.444
Rogers&Tanimoto ^a	0.200	0.500	0.286
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/AS2501_R
Simple Matching ^a	0.333	0.556	0.333
Rogers&Tanimoto ^a	0.200	0.385	0.200
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

Conclusions

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 section 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.

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 of these two audit standards.

Among the limitations 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.

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Appendix				
Analyzed theme	Analyzed element of the theme	Auditing referentials		
		Old ISA 540	ISA 540 Revised & ISA 500 amendments	AS2501 Revised & AS 1105 amendments
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	Mentioning a risk-based approach to auditing estimates	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	Inherent risk factors specific to accounting estimates			
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. Use of experts and use of external sources of information				
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 external sources of information (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 and 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