

The quest for legitimacy: The European Court of Auditors' work on fraud

Andreea Hancu-Budui¹  | Ana Zorio-Grima¹ | Jose Blanco-Vega²

¹Departament de Comptabilitat, Facultat d'Economia, Universitat de València, Valencia, Spain

²Valencian International University, Valencia, Spain

Correspondence

Andreea Hancu-Budui, Departament de Comptabilitat, Facultat d'Economia, Universitat de València, Avda Tarongers s/n, 46022 Valencia, Spain.

Email: hanbuan@uv.es

Abstract

This research aims to contribute to the debate on fraud on public funds and the work that public auditors perform on this important topic, providing a useful analysis for government officials concerned about accountability, good governance, and transparency. This article presents a retrospective analysis of the European Court of Auditors' (ECA) role in combating and preventing fraud. Using innovative research tools such as the Valence Aware Dictionary and sEntiment Reasoner lexicon and other quantitative and qualitative research methods, evidence is found that ECA fraud audits reach a more negative tone in their conclusions than in the rest of the audits and that their audit recommendations on fraud are accepted to a lesser degree than the rest. Although in recent years the ECA has taken a more active role regarding fraud and stirring the public debate on this topic, its work is still hampered by its non-jurisdictional statute. The results obtained contribute to the literature on fraud in the public sector by bringing empirical evidence on public sector fraud audit with data of an under-researched and unique Supreme Audit Institution. This article opens up new avenues for future research and has practical implications for practitioners by offering them insights on their role

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on the issue, thus helping them to address some areas more prone to be affected by fraud.

KEYWORDS

European Court of Auditors, fraud, public sector audit, sentiment analysis

1 | INTRODUCTION

Fraud has been traditionally a matter of concern for the European Union (EU)'s citizens according to several Eurobarometer¹ surveys. In 2015, this survey showed that more than 70% of respondents thought that fraud in the EU budget happened frequently. Hence, this topic is of great interest for the EU and its citizens.

In this context, the objective of the paper is to examine the European Court of Auditors' (ECA) work on fraud on the EU budget, with the aim to contribute to the debate about fraud on public funds and make a stand on the Supreme Audit Institutions' (SAIs) role toward combating fraud (Tucker et al., 2020).

This study focuses on the ECA as the watchdog of EU finances, an understudied but unique audit institution (Matei et al., 2021). The EU SAI has non-jurisdictional status (Sánchez-Barrueco, 2015), which means that it cannot issue judgments nor impose sanctions on the auditees. This status increases its necessity to legitimize its activity and existence by scrutinizing tasks of pressing interest for the citizens, such as fraud, in order to maintain its reputation and therefore its position (Tidå, 2021). Therefore, we look into the EU fraud-related context as assessed by the ECA and ECA's work performed to date on the topic. Discussion of the results obtained leads us to make important reflections on the implications of the ECA's role on fraud and the emergence of big data (Vasarhelyi et al., 2015; Warren et al., 2015) and its potential impact on fraud detection.

This study is of a quantitative, qualitative, and descriptive nature, based on archival research through an in-depth empirical analysis of ECA's audit outputs related to fraud. The analysis revolves around the ECA's role in fraud detection. We approach it in hindsight to be able to open avenues for research as disruptive events such as the emergence of big data may have significant future impact on the auditor's tasks and role (Balios, 2021; International Organization of Supreme Audit Institutions, 2019; Otia & Bracci, 2022). Among other methodologies, this study uses one of the most trusted techniques for content analysis, VADER lexicon (Valence Aware Dictionary and sEntiment Reasoner)—a lexicon and rule-based sentiment analysis tool based on qualitative and quantitative methods (Hutto & Gilbert, 2014) to analyze the tone of the auditors' conclusions and the auditees' replies.

All in all, our research makes a valuable contribution to literature by discussing the EU auditors' role in the fight against fraud and their continuous search for legitimacy and relevance by adapting their activities toward scrutinizing pressing matters for the citizens (Grossi et al., 2023; Tidå, 2021). It also adds evidence to a relevant topic of research regarding the impact of performance audit (Reichborn-Kjennerud, 2013), because we look into the recommendations and conclusions stated in ECA's special reports (SRs), in order to confirm that there are differences in the level of acceptance and implementation of recommendations as well as in the tone of conclusions and subsequent replies, depending on whether they are related or not to fraud.

2 | THEORETICAL FRAMEWORK

Government officials and legislators should be highly concerned about accountability, good governance, and transparency (Ferry et al., 2015). Within the EU, the fight against fraud and corruption is uneven, due to the heterogeneity of the member state (MS)'s culture, social attitude, and commitment against fraud and corruption (Börzel et al., 2010)—with some countries where this type of behavior can be somehow socially accepted and may interfere with good governance (Dye, 2007).

Fraud and corruption have been studied from political and legal perspectives (Bastida et al., 2019; Pujas, 2003; Quirke, 2009; Williams, 2013), or by their implications in financial audit (Eutsler et al., 2016). This topic has also been explored with an emphasis on big data analytics from different perspectives: literature surveys (Agostino, Saliterer, et al., 2022; Ngai et al., 2011); identification of new research avenues (Appelbaum et al., 2017; Gepp et al., 2018; Schmitz & Leoni, 2019); fraud factors identification (Huang et al., 2017) and specific technical approaches such as blockchain (Bonsón & Bednarova, 2019), or the use of Computer Assisted Audit Techniques and its implications for the audit outcome (Gambetta et al., 2016). Moreover, research on fraud in public utilities has shown how big data techniques may contribute to fraud detection (Casado-Vara et al., 2018).

However, there is scarce research on the public auditors' role in tackling fraud (Hay & Cordery, 2018). One of the most prominent works on this topic was written by Dye (2007), who suggests how to improve auditors' role in detecting and preventing fraud, mainly by offering a series of actions for auditors, such as training activities, cooperation with other organizations, or using forensics capabilities. All of them are still valid but need to be updated with the opportunities the digital transformation brings (Agostino et al., 2022), as fraud is seldom detected in audits through traditional sampling methods (Hassink et al., 2010). Jeppesen (2019) focused on the auditors' role in fighting corruption, concluding that auditors are reluctant to detect it and generally dissociate their auditor's role from the concept of fraud, although both are generally related (Huberts, 1998; Kratcoski & Edelbacher, 2018).

Fraud perception reduces the public's willingness to comply with tax obligations (Moro-Egido & Solano-García, 2020). Specific areas of public fraud such as procurement fraud have contributed to shape academic theories such as the fraud triangle or the fraud diamond (Mansor, 2015; Rustiarini et al., 2019). Fraud poses a risk on the sustainability of public finances and diminishes the citizens' trust in public management (Reichborn-Kjennerud et al., 2019). Thus, fraud is a matter of public interest. Seeking to ensure sound public management, auditors assume a key role in supervising and alerting on fraud risks, seeking to justify their activity by scrutinizing matters important for their stakeholders (Yamamoto & Kim, 2019) and thus legitimize their existence and relevance (Suchman, 1995). This quest for legitimacy induces smoothing the messages transmitted and the language used by the auditors through audit findings (Parker et al., 2018). Auditees expect public auditors to convey competent and achievable audit recommendations (Parker et al., 2018; Reichborn-Kjennerud & Vabo, 2017). Public auditors operate in an interchangeable environment, interacting with and depending on other actors, which enhances their need to adjust their messages to the general streamline of discourse (Radcliffe, 2011). Despite this, the auditors perceive the impact of their work through the acceptance and implementation of their audit recommendations (Torres et al., 2019), and this motivates them to diverge from the auditees' logics, if needed (Parker et al., 2018, 2021), inducing change and improvements into public action (Radcliffe, 1999).

Hence, our research is framed within the legitimacy theory, combined with institutional logics (Parker et al., 2021). To maintain or improve their legitimacy, organizations may try to meet or shape social perceptions or expectations by altering their activities (Dowling & Pfeffer, 1975; O'donovan, 2002). From an institutional theory viewpoint, orga-

does not focus on public value as an accountability-checking factor from a political and democratic viewpoint (Moore, 2013), or a social perspective (Bozeman, 2007), nor from an entrepreneurial perspective of creating value by reshaping public organizations (Moore, 1995). Instead, we focus on public value seeking to confirm if public auditors followed the prevalent logics—the public value logic (Grossi et al., 2023)—by aligning its audit task to pressing public matters with a view to gain legitimacy in front of their main stakeholders (Hancu-Budui & Zorio-Grima, 2021).

More research is needed in public sector audit, especially on certain jurisdictions or topics (Agostino, Saliterer, et al., 2022; Hay & Cordery, 2020; Mattei et al., 2021). Research on performance audit helps better understanding of SAIs influence on the auditees (Reichborn-Kjennerud, 2014), with an impact on public policy and management, toward legitimizing their roles by upholding their reputation as accountholders of other public actors (Tidå, 2021).

Previous literature shows that research on fraud in the public sector is timely and necessary (Mattei et al., 2021) and that big data will have a considerable impact on how auditors perform their task and how digital audit may improve audit results (Otia & Bracci, 2022). So far, fraud has been approached by the auditors in a traditional manner—by sampling—and its detection is not the ultimate purpose for the audit task, as the public audit standard on fraud limits the auditor's responsibilities on this matter. With a retrospective look on the EU auditors' outputs on a public interest topic such as fraud, this study aims to show the auditors' relevance and their approach on this matter, as we need to understand the past to make a better future, especially in a context that will be changed by the digital transformation. This approach could imply to allow auditors to have a much more active and prominent role in fraud detection and prevention, yet it would mean redesigning audit standards (Manita et al., 2020), posing numerous technological, legal, and ethical challenges (Munoko et al., 2020).

3 | THE RESEARCH CONTEXT: THE EU AUDITORS' OUTPUTS ON FRAUD

As a frame for the quantitative analysis undertaken in this paper (next section), this section presents a qualitative analysis of the ECA reports related to fraud together with other ECA documents—such as audit opinions, audit guides, and the ECA Journal.

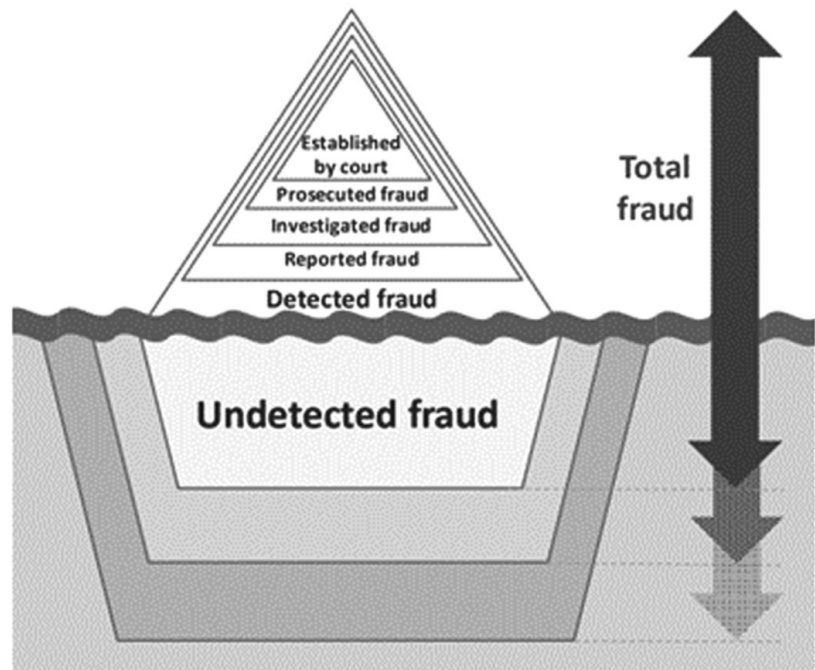
The ECA gained full competences as a scrutinizer of the EU actions under the Amsterdam Treaty, but its non-jurisdictional status is a key insufficiency to fulfill its audit role (Sánchez-Barrueco, 2015), hindering its position as accountholder of other EU actors in sensitive topics such as fraud and corruption.

Among the International Standards for SAIs, the ISSAI 1240 is specific on fraud. It states that auditors' responsibility goes only as far as any detected fraud or abuse in public accounts significantly affects the financial statements. The auditors' responsibility is thus limited to signaling encountered material misstatements due to fraud and, therefore, very restricted in fraud detection and basically null in fraud prevention.

The EU does not estimate budgetary fraud (ECA, 2019b), but the ECA suggests the magnitude of the problem (Figure 1).

The main EU body for fighting fraud against the Union's financial interests is the European Anti-Fraud Office (OLAF), established in 1999. This has been recently reinforced with the establishment of the European Public Prosecution Office (EPPO), in 2017, which started its operations in 2021 and the mandate of which is to investigate and prosecute crimes against the financial interests of the EU, including fraud and corruption. The impact of its establishment in combating fraud remains to be seen. OLAF issues annual reports with recommendations for fund recoveries

FIGURE 1 Fraud level in the European Union (EU) budget.
Source: ECA, 2019b, p. 13.



activity—that is, insufficient qualified staff, lack of objectives, and weak establishment of priorities (ECA, 2005), which were confirmed by a follow-up audit concluding that previous recommendations had not been implemented and essential aspects of OLAF’s activity were still deficient (ECA, 2011).

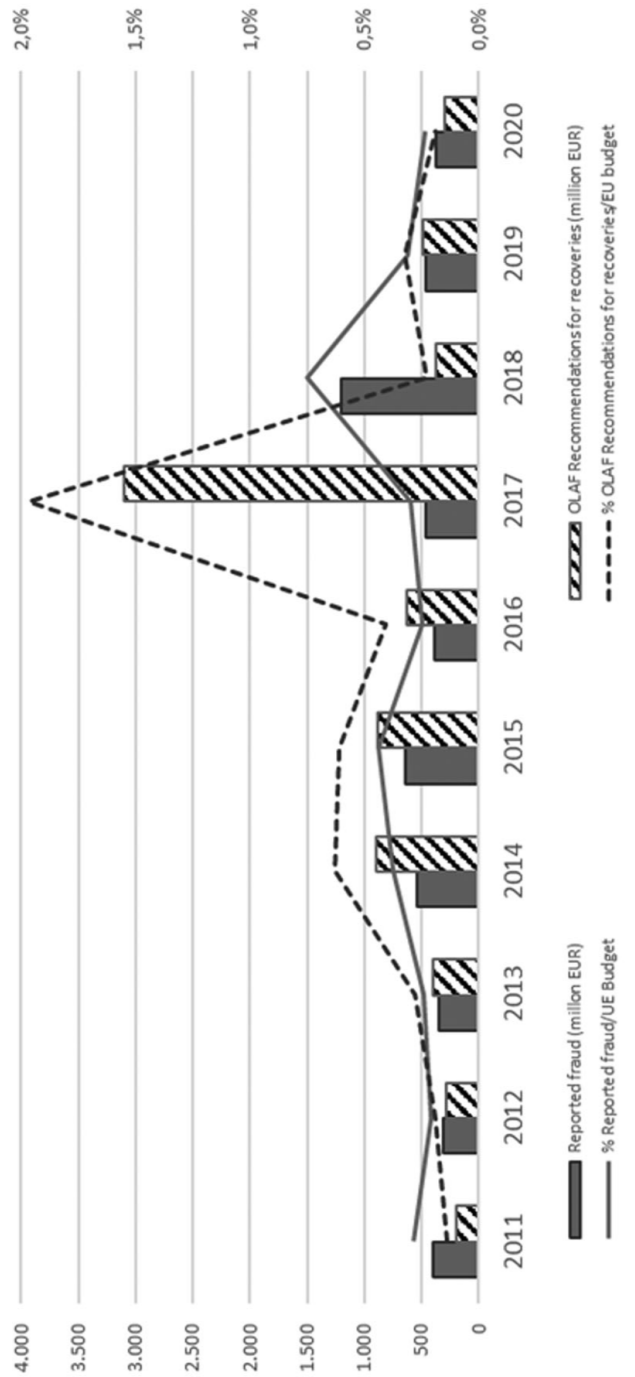
In recent years, the EU auditors have emphasized the anti-fraud task as a priority, confirming both its quest for legitimacy and its public value logic. Since 2013, the ECA has included information on the number of audited transactions suspected of fraud and transferred to OLAF (see Table 1 in its annual audit report [AR] of the EU budget).

The ECA implemented a fraud audit guide (ECA, 2014), including the evaluation of fraud-related risk factors. Subsequently, the ECA issued a series of fraud-specific SRs and opinions, focusing on high-risk areas such as revenues (VAT and customs duties) or cohesion expenditures.

The auditors assessed the VAT fraud against the MS budgets impacting the EU revenues (ECA, 2015) and recommended that VAT should be included within the scope of the PIF Directive and the EPPO regulation, granting OLAF effective tools to investigate VAT fraud. The VAT was partially reflected in the PIF Directive but only for cases above 10 million EUR, hence limiting its scope. This limited acceptance of the ECA’s recommendation could mean a potential annual loss of EU revenues of 150 million EUR—that is, 0.3% of the estimated 50 billion EUR EU VAT fraud (Jourova, 2016).

The ECA (2017) has audited import procedures and customs duties. As an EU revenue, customs duties represent around 20 billion EUR (14% of EU budget). Customs duty evasion widens the customs gap, imposing higher contributions from the MS to the EU budget, being ultimately borne by European taxpayers. A significant audit observation was the systematically undervalued textile imports from China to the United Kingdom in about 2 billion EUR, which led to an OLAF investigation and subsequent recommendation for recoveries accounting for the 2017 peak in Figure 2, the recovery of which remains uncertain.

EU institutions have not concentrated enough on fraud prevention (ECA, 2019b), and they lack a holistic assess-



515 fraud and against the companies that reported fraud and OLAF's recommendations for recovery official Journal.³

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TABLE 1 Suspicious fraud operations reported by European Court of Auditors (ECA) to OLAF

	2013	2014	2015	2016	2017	2018	2019	2020
Number of cases detected during the annual EU budget audit	14	16	12	11	13	9	9	6
Audit sample (number of audited transactions)	1214	1224	1094	1021	687	701	747	681
Relative weight of detected cases/sample (%)	1.15	1.31	1.10	1.08	1.89	1.28	1.20	0.88
Cases reported by ECA with information from third parties	–	6	15	5	6	0	0	0

Abbreviations: AR, audit report; EU, European Union.

Source: Own elaboration based on the AR published in the EU Official Journal and on the ECA's website.⁴

The ECA encourages auditees to use existing IT tools and to implement new ones to tackle fraud. It urges MS to use the ARACHNE database² by updating information and to use big data analytics to help prevent irregularities in the use of EU funds. The Commission partially accepts the ECA's recommendations but underlines that fraud detection often falls under the MS responsibility, including the use of ARACHNE.

In a report on fraud in EU cohesion spending (ECA, 2019c), an area with a significant incidence of reported fraud, the auditors observe no improvement in fraud detection measures for 2014–2020 compared to 2007–2013. Data analytics is underused in fraud detection, this being one of the most important audit conclusions. Over 70% of the MS Managing Authorities are using ARACHNE, and over 90% of them are using other data analytics/data mining techniques—spreadsheets considered—although less than 50% consider these tools as being effective in identifying and preventing fraud. The auditors make again recommendations on developing strategies and adopting policies to combat fraud, stressing the need for increasing the use of data analytics tools, proactive fraud detection methods, and monitoring fraud response mechanisms.

Table 2 summarizes the abovementioned outputs of the ECA's work on fraud.

The ECA's fraud-specific recommendations have not solved the lack of fraud measurements. The auditors have often emphasized the use of digital tools for tackling fraud yet this recommendation has only been considered by the Commission recently with the launch of the Joint Analytics Capabilities Initiative to exploit the data already available to improve the assessment of fraud risk against EU financial interest (ECA, 2021a).

The EU auditors have performed an increasing task on fraud, making visible the need for action from EU institutions and MS to detect and prevent it. In the last decade, the auditors issued their most important reports on fraud (Table 2), in line with the public value logic—that is, embedding socially relevant issues into their task and demonstrating the relevance of their activity (Cordery & Hay, 2019). In this sense, ECA has dedicated one issue of its journal exclusively to fraud and corruption (ECA, 2019a).

By increasing its focus on fraud and issuing public reports, the ECA contributes to stirring the public debate on the topic and, from its accountholder's position, offers a fact-checked and evidence-based basis for other stakeholders—the citizens, business organizations, and the media—so they can call to order their EU public representatives and decision-makers. SRs are a valuable source of information on ECA's findings on fraud, which has not been analyzed yet by extant research. The empirical study that we present next is innovative as it brings evidence on the effectiveness of the audit outputs and its differential impact or tone if related or not to fraud issues.

TABLE 2 Summary of the European Court of Auditors (ECA)'s outputs on fraud

Year	Output	Highlights
1998	SR on UCLAF	
2005	SR on OLAF	Essential aspects of OLAF's activity deficient
2011	SR on OLAF (follow-up)	No advance with respect to the 2011 Report
2014	Fraud Audit Guide	
2015	SR on the fight against intra-community VAT fraud	VAT under PIF directive partially accepted
2017	SR on import procedures and customs duties	
2018	Opinion on OLAF	Mid-term—assessing the cooperation OLAF-EPPO
2018	Opinion on the EU anti-fraud program	Anti-fraud instruments—single regulatory framework
2019	SR “fighting fraud in EU spending: action needed”	Need of convergence between and EU and MS Fraud risk management under one Commissioner
2019	SR “tackling fraud in EU cohesion spending: managing authorities need to strengthen detection, response and coordination”	Significant incidence of reported fraud Improvement in fraud prevention measures No improvement in fraud detection measures
2019	ECA Journal: special Issue on fraud and corruption	
2019	SR on VAT and customs duties collection on cross-border e-commerce	EU is addressing all fraud challenges on VAT and customs duties
2020	ECA Journal: big data and digital audit	Digital audit may have an important role in preventing fraud

Abbreviations: EPPO, European Public Prosecution Office; EU, European Union; MS, member states; SR, special report.

Source: Own elaboration based on the special reports published on the ECA's website.

recommendations and their level of acceptance and follow-up, as well as the audit conclusions and the replies received from the auditees.

Given the importance that citizens give to the fight against fraud, our purpose is to gain relevant insights on whether the EU auditors' work on fraud is different from the rest of their audit work. For this, we use one of the most common tools for measuring the audit impact (International Organization of Supreme Audit Institutions, 2022), namely, acceptance and implementation of audit recommendations (H1), along with the tonality assessment of audit conclusions and the corresponding auditee's replies (H2).

Hence, two hypotheses are put forward.

- H1.** Fraud-related audit recommendations are accepted and implemented differently than the rest of non-fraud recommendations issued by the ECA.
- H2.** Fraud-related audit conclusions (H2a) and their corresponding auditees' replies (H2b) are different in tonality from non-fraud conclusions and replies.

To test our hypotheses, we seek significant statistical differences between the two groups of recommendations and

TABLE 3 Sample of audit recommendations, audit conclusions, auditees' replies

	Fraud obs.	Non-fraud obs.	Total obs.
Audit recommendations—H1	27	887	914
Audit Conclusions with auditees' replies ^a —H2a	45	1729	1774
Auditees' replies to conclusions—H2b	45	1729	1774

^aThe database contains a total of 2687 conclusions (76 fraud-related and 2611 non-fraud related), but 913 of them did not receive a reply from the auditees.

so that an analysis could be carried out by comparison of the two groups. The composition of the sample is presented in Table 3.

The acceptance and follow-up of recommendations were classified into different categories. For the acceptance degree of audit recommendations, the categories used are the following: accepted recommendations, partially accepted recommendations, not accepted recommendations, recommendations for the MS—which do not have the obligation to accept nor attend the ECA's recommendations, recommendations with no reply, and other replies that do not give a hint about the degree of acceptance by part of the auditees. For the follow-up of recommendations, the categories are as follows: fully implemented, implemented in most respects, implemented in some respects, not implemented, implementation could not be verified, no longer relevant recommendations, recommendations that were not nor will ever be followed up, and recommendations not yet followed up. However, for the analysis of H1, we retain only the categories of observations as presented in Table 4. The rationale for retaining only these observations is that we consider it more robust and relevant to analyze only the observations, the level of acceptance of which is clear and the implementation of which could be assessed by the auditors.

To confirm H1, we use Fisher's exact for categorical variables, given that some of the observations' frequencies are below 5. For a complete analysis, we seek to confirm differences between the levels for Acceptance and Follow-up by a group of recommendations (fraud/non-fraud), and we also compare the two groups with a compound variable acceptance + follow-up which has 12 categories (each acceptance category by its follow-up level). All tests are performed in Stata.

For H2, we use the audit conclusions and their replies as given by the auditees, and only conclusions with replies are considered (Table 1). For the 1774 observations, we use sentiment analysis techniques on conclusions and auditees' replies content. Sentiment analysis, a subfield of natural language processing under the data mining and computational semantics discipline, aims to measure the writer's attitude based on the computational assessment of subjectivity in a given text. For this analysis, we use the Python library VADER, a lexicon and rule-based sentiment analysis tool (Hutto & Gilbert, 2014), one of the most trusted, especially created for "microblog-like" unlabeled data. The algorithm relies on a dictionary that maps lexical features to different degrees of emotional intensities which then translates into sentiment scores. The sentiment score of a text can be obtained by summing up the intensity of each word encountered in the text. VADER produces a tonality score (hereinafter referred to as compound score) for each analyzed text ranging from -1 (totally negative) to $+1$ (totally positive). Table 5 presents examples of fraud-related conclusions and their replies with their respective sentiment analysis score. The algorithm does not need preprocessing as the observations included in the database (conclusions and replies) were already structured similarly to microblog formatting. Our data certainly matches the criteria, as audit conclusions and their replies

Table 1: Follow-up of recommendations' implementation analysis (H1)

	Fraud					Non-fraud					Total
	Implemented in most respects	Implemented in some respects	Not implemented	Total	Fully implemented	Implemented in most respects	Implemented in some respects	Not implemented	Total		
15	2	2	0	19	484	123	115	12	734	753	
1	0	0	0	1	57	14	15	7	93	94	
1	1	2	3	7	8	3	13	36	60	67	
17	3	4	3	27	549	140	143	55	887	914	

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TABLE 5 Examples of performance audits conclusions and auditees' replies on fraud and sentiment analysis values

Special report	Conclusion	Auditee's reply
<p><u>SR 24/2015</u></p> <p>Tackling intra-community VAT fraud: more action needed</p>	<p>Using data for fraud prevention and deterrence can be an effective way either to identify risky economic operators before allocation of funds or to improve future compliance by debarring economic operators and individuals who have been detected committing fraud. Within the Commission, there have been DG-level initiatives to establish such databases, but the use of these tools has been rather limited and not sufficiently coordinated. In particular, the preventive and deterrent impact of the Commission's exclusion and sanctioning system is limited, as the DGs in charge of Cohesion policy and Agriculture do not have the power to initiate an exclusion request for fraudulent economic operators supported through these funds. In addition, Member State authorities are not obliged to take exclusion decisions into account in any financing decision involving EU money</p> <p>VADER compound score: <u>-0.459225 (rather negative)</u></p>	<p>Under shared management, it is up to member states to take all necessary measures to protect the EU financial interests, in particular those preventing, detecting, and correcting irregularities and fraud, as appropriate and on their own responsibility. In this respect, they have access to the exclusion decisions taken as part of EDES</p> <p>VADER compound score: <u>-0.01728 (rather neutral)</u></p>
<p><u>SR 06/2019</u></p> <p>Tackling fraud in EU cohesion spending: managing authorities need to strengthen detection, response and coordination</p>	<p>As regards fraud response, we found that managing authorities under-report fraud and that this affects the reliability of the fraud detection rates published in the PIF reports. Several managing authorities also fail to systematically communicate suspicions of fraud to investigation or prosecution bodies. We found that managing authorities focus on the withdrawal of EU funding and do not always recover fraudulent amounts from perpetrators or impose dissuasive penalties or sanctions. Nor do managing authorities satisfactorily assess the possible horizontal implications of cases where fraud is suspected. All of these aspects severely limit the deterrent effect of fraud investigations</p> <p>VADER compound score: <u>-0.64054 (very negative)</u></p>	<p>The Commission pointed out several times in the PIF reports the concrete possibility of under-reporting by some member states. The Commission is continuously developing IMS and provides guidance on reporting to member states in order to mitigate such risks. Furthermore, the fraud detection rates and their related multiannual analysis have been designed taking into account such shortcomings</p> <p>VADER compound score: <u>-0.10335 (slightly negative)</u></p>

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TABLE 6 Analysis of recommendations

Panel A—Statistics on the acceptance of recommendations					
	Fraud recom- mendations	%	Non-fraud rec- ommendations	%	Fisher's exact
Accepted recommendations	19	70.37	734	82.75	$p = 0$
Partially accepted recommendations	1	3.70	93	10.48	
Not accepted recommendations	7	25.93	60	6.76	
<i>Total</i>	27	100	887	100	
Panel B—Statistics on follow-up on recommendations implementation					
Fully implemented	17	62.96	549	61.89	$p = 0.697$
Implemented in most respects	3	11.11	140	15.78	
Implemented in some respects	4	14.81	143	16.12	
Not implemented	3	11.11	55	6.20	
<i>Total</i>	27	100	887	100	
Panel C—Statistics on combined acceptance and implementation					
Accepted and fully implemented	15	55.56	484	54.57	$p = 0.084^*$
Accepted and implemented in most respects	2	7.41	123	13.87	
Accepted and implemented in some respects	2	7.41	115	12.97	
Accepted and not implemented	0	0.00	12	1.35	
Partially accepted and fully implemented	1	3.70	57	6.43	
Partially accepted and implemented in most respects	0	0.00	14	1.58	
Partially accepted and implemented in some respects	0	0.00	15	1.69	

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TABLE 6 (Continued)

Panel C—Statistics on combined acceptance and implementation				
Not accepted and implemented in most respects	1	3.70	3	0.34
Not accepted and implemented in some respects	2	7.41	13	1.47
Not accepted and not implemented	3	11.11	36	4.04
<i>Total</i>	27	100	887	100

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

To analyze the influence of the conclusions' tonality on the auditees' replies, we use bivariate analysis. We consider only conclusions that have received replies (45 out of the 76 fraud-related conclusions and 1729 out of 2611 non-fraud-related conclusions, respectively; see Table 2). For these quantitative variables, we compare fraud and non-fraud conclusions, and fraud and non-fraud replies by means of the Mann–Whitney test (appropriate for quantitative variables, unequal groups and not normally distributed data).

5 | RESULTS

H1. Fraud-related audit recommendations are accepted and implemented differently than the rest of non-fraud recommendations issued by the ECA.

To confirm H1, from our final sample of recommendations, the implementation of which was followed and which have a certain degree of acceptance (Table 4), we analyze data on recommendations by degrees of acceptance (Table 6—Panel A) and implementation by the auditees (Table 6—Panel B), and both of them combined, acceptance and implementation (Table 6—Panel C).

Upon performing Fisher's exact, the test results on our three assumptions confirm that followed-up recommendations are different for fraud and non-fraud by the degree of acceptance (Table 6—Panel A) at the 1% significance level and do not confirm that they are different by degree of implementation (Table 6—Panel B). By the degree of acceptance, we observe that not only those fraud recommendations are accepted less than non-fraud recommendations (70.37% vs. 82.75%) but also they are almost four times more likely to be rejected by auditees (25.93% vs. 6.76%). Furthermore, looking to understand how the degree of implementation impacts the acceptance of the recommendations, we combined the two categories, obtaining 12 categories of recommendations (Table 6—Panel C). The analysis of the recommendations counted by combined degrees of acceptance and implementation shows with a 10% significance

TABLE 7 Sentiment analysis

	Fraud (N = 45)		Non-fraud (N = 1729)		Fraud vs. non-fraud
	Mean	Std. Dev.	Mean	Std. Dev.	Mann–Whitney
Conclusions	−0.2680	0.5877	0.2431	0.5424	−5.5030*** ($p = 0.0000$)
Replies to conclusions	0.1592	0.6617	0.4581	0.4733	−2.8170*** ($p = 0.0048$)

*** $p < 0.01$.

** $p < 0.05$.

* $p < 0.1$.

We may conclude that followed-up fraud and non-fraud recommendations are significantly different on their distribution by degrees of acceptance but not by their degree of implementation, although combined acceptance and implementation are also different for the two groups.

H2. Fraud-related audit conclusions (H2a) and their corresponding auditees' replies (H2b) are different in tonality from non-fraud conclusions and replies.

Table 7 presents the results of the sentiment analysis performed with the VADER algorithm to analyze the polarity of audit conclusions and the auditees' replies.

Compound scores for text tonality show that, on average, conclusions on fraud clearly have a negative tone (−0.2680), compared to the positive tone of non-fraud conclusions (0.2431). Additionally, fraud replies, while having a slightly positive tone (0.1592) in average, score significantly lower than the other auditees' replies (0.4581). The standard deviations suggest that most observations have a quite polarized tonality (neutral tonality is considered to be between −0.05 and 0.05). According to the Mann–Whitney tests (Table 7), we may conclude regarding H2, those conclusions (and replies) are significantly more negative (less positive) if related to fraud than to other issues.

These findings also add to our findings for H1 in that the main features of performance audits—conclusions and recommendations—are essentially different for fraud-related audit when compared with non-fraud ones.

6 | CONCLUSIONS AND DISCUSSION

Our findings confirm the theoretical approach adopted. The ECA has performed an increasing task on fraud, confirming the relevance of its role as an accountholder at EU level (Tidå, 2021). This task helps the organization legitimize its existence, revealing a public value logic by performing relevant work on a matter of public concern (Almqvist et al., 2013; Hancu-Budui & Zorio-Grima, 2021) and stirring the debate on fraud, a sensitive topic of public concern in which the auditors do not play a key role yet (Bryan, 2022).

Overall, our results show that fraud-related audits are essentially different from the rest of the audits the ECA performed, with more negative tonality and with less accepted recommendations. The lower degree of acceptance for fraud-related recommendations compared to the rest may pose a question on the auditor's capabilities to inflict change on the auditees on sensitive matters such as fraud, bearing in mind that they do not have a jurisdictional status and therefore cannot impose sanctions. Although we could not find previous research comparing fraud to non-fraud

(which is also detected in auditees' replies) in matters of fraud—which is a pressing public concern—as expected under a legitimacy (Suchman, 1995; Tidå, 2021; Yamamoto & Kim, 2019) and NPG approach (Almqvist et al., 2013; Grossi et al., 2023).

This article aims to make a methodological contribution to literature by proposing a new methodology of analysis for audit conclusions and auditees' replies. Sentiment analysis may open up new avenues for research in the field of public sector performance audit, to detect not only significant differences as this study does but also to explore if it can help achieve higher impact among the auditees' actions and subsequent corrective actions. The auditors seek to produce an impact through the acceptance and implementation of audit recommendations by the auditees (Torres et al., 2019)—inducing changes and improvements into public action (Radcliffe, 1999)—but our findings bring evidence that sometimes there is a divergence from the auditees' logics, which adds to Parker et al. (2018, 2021).

These findings are relevant at EU level because fraud is a sensitive matter for the EU citizens as the Eurobarometer surveys show over the years. This retrospective research on the ECA's work on fraud offers practitioners insights into the limitations and consequences of auditing sensitive topics with traditional audit procedures, offering qualitative and quantitative empirical evidence of the difficulties for public auditors to make an impact on public actions—less accepted recommendations for fraud than non-fraud, however more non-accepted recommendations which are finally implemented by the auditees.

These findings are also relevant for other SAIs because the audit profession is at a moment of change due to the digital transformation (Otia & Bracci, 2022). The SAIs, in their main role as accountholders, will be highly affected by these transformations at multiple level: technical, normative, professional, and relational. This process will also have a significant impact on the expectation gap (Krieger et al., 2021). At a technical level, this digital transformation will allow for continuous audit procedures (Zhang et al., 2015), which will allow for a constant monitoring of the auditees' data and processes leading to the detection of irregularities, fraud, or faulty processes in real time. It will help to identify patterns and areas more prone to fraud risk, shifting from identifying misstatements due to error or fraud to actually being able to detect and prevent fraudulent transactions (Bradford et al., 2020), a field in which, as we have seen, auditors do not play a decisive role yet. Continuous audit would also imply reflecting on internal controls or risk assessment, traditionally linked to sampling, and on redesigning audit standards (Manita et al., 2020). From an ethical viewpoint, this evolution will entail policy and legal changes as well as changes in audit standards to facilitate the introduction of big data and artificial intelligence in the audit process (Balios, 2021; Munoko et al., 2020). The auditors will need to acquire new technical skills and to cooperate with specialists from different fields, including data analysts and forensics (Tjeng & Nopianti, 2020). However, recent research shows that public auditors are not fully aware of the impact that the digital transformation will have on their independence and professional skepticism (Aquino et al., 2022) and there is still limited evidence in literature about digital transformation's impact on public accounting, audit, and accountability, with most research focused on the private sector (Agostino, Saliterer, et al., 2022). Therefore, in the case of fraud, the digital transformation is expected to change essentially the role auditors play, from a very limited and marginal one to becoming core to their mandate and thus increasing the relevance of their work.

Recent comparative research showed that the ECA is one of the European SAIs with a more proactive attitude toward the digital transformation of the audit profession (Otia & Bracci, 2022). However, despite the creation of the ECA Lab and of educational initiatives such as the Summer School in Public Auditing and Accountability⁵ or the Technology and Innovation for Audit (TINA) network (ECA, 2021b), a knowledge-sharing online platform, the organization has still a long journey toward full digital audit, thus benefiting matters of public concern such as fraud.

which will further contribute to them adding value to the society. It also offers auditors insights into the application of text mining techniques (e.g., Zorio-Grima & Carmona, 2019), on audit findings and the responses from the auditees.

This article opens avenues for new research. Because all the abovementioned changes brought by the digital transformation do not come without obstacles, future research may study the limitations the digital transformation will have and how these may be overcome, with a specific focus on fraud detection and prevention (Appelbaum et al., 2017; Salijeni et al., 2019). It also offers a method of analysis of audit findings through sentiment analysis, which may be applied to any topic or to any other audit institution's ARs.

Last but not least, the ECA's action on fraud should be underlined as a response to a matter of public concern and as a stirrer of public debate, allowing the EU audit institution to uphold its reputation and public perception, although hampered by its non-jurisdictional mandate.

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DATA AVAILABILITY STATEMENT

The main database used in this research was provided by the European Court of Auditors, and the authors acquired a confidentiality commitment with the institution. The authors are not authorized to publish said database in any public repository unless it is mandatory and only upon informing the European Court of Auditors. Data is available for the Special Issue editors and the reviewers.

ORCID

Andreea Hancu-Budui  <https://orcid.org/0000-0001-8488-5181>

NOTES

¹ <https://europa.eu/eurobarometer/screen/home>

² <https://ec.europa.eu/social/main.jsp?catId=325&intPagelId=3587&langId=en>

³ eur-lex.europa.eu

⁴ <https://www.eca.europa.eu/en/Pages/AuditReportsOpinions.aspx>

⁵ <https://www.unipi.it/index.php/society-economics-and-law/item/11683-summer-school-public-auditing-accountability>

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