

Review

# Research Topics in Accounting Fraud in the 21st Century: A State of the Art

Monica Ramos Montesdeoca, Agustín J. Sánchez Medina<sup>✉</sup> and Felix Blázquez Santana \*

Instituto Universitario de Ciencias y Tecnologías Cibernéticas, University of Las Palmas de Gran Canaria, 35017 Las Palmas de Gran Canaria, Spain; monica.ramos@ulpgc.es (M.R.M.); agustin.sanchez@ulpgc.es (A.J.S.M.)

\* Correspondence: felix.blazquez@ulpgc.es

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**Abstract:** Companies play a role in society that clearly goes beyond mere economic interest. Their contribution to social development and to the sustainability of the territory where they are located seems unquestionable. However, after the great financial scandals of companies such as ENRON, WorldCom or AHOLD, interest groups require accurate and transparent financial information. The development of more demanding financial reporting standards seems, however, not to have been up to scratch, since accounting fraud continues to be detected all over the world. The search, therefore, for possible causes that may induce companies to act unethically was the main motivation behind this research. To do this, a review of the literature in high-impact journals that has dealt with accounting fraud, covering the main lines of research, was carried out. The findings of the literature review highlight the importance of responsible corporate governance and good accounting practices, as well as the importance of certain psychological characteristics of managers and employees as enhancers of the lack of ethics. It is clear that the social cost of accounting fraud should be minimized, and governments should develop specific policies that combine responsible corporate governance in companies with the sustainability of their environment.

**Keywords:** accounting fraud; literature review; misstatement; audit; corporate governance

## 1. Introduction

In an increasingly commercialized world, the drive of companies directs social development and determines the evolution of sustainability in society and the environment. From this perspective, adequate business management marked by clearly rooted ethical standards conditions the development of a more balanced society in an environment that adequately combines economic development and sustainable business behavior, which constitutes Corporate Social Responsibility [1].

According to Joss [2], ethics condition the sense of responsibility, and this, in turn, has a particular importance in relation to sustainability. In fact, ethical and moral judgments allow us to direct the difficult choices between economic, social and environmental priorities, so that there is no conflict between profitability objectives and social objectives.

In recent years, and before the accounting scandals of major companies worldwide, there has been an increase in the demand for business information. This demand has focused on both ethical and social issues, as well as environmental aspects, highlighting the clear convergence of these areas, seemingly disparate, and yet strongly linked to a sense of responsibility [3]. Corporate social responsibility has thus become a strategic requirement for competing [4]. According to Kim, Park and Wier [5], there is evidence of a positive relationship between sustainable business practices and the quality of the accounting result. Similarly, the work of Kolk [6] reflects the awareness of the link between corporate governance and broadly defined sustainability.

On the contrary, a lack of ethics encompasses a lack of responsibility, which generates the fraudulent action of certain managers. The consequences of managerial malpractice by managers are harmful to companies, causing them to lose value, reputation and image [7]. In addition, a negative relationship has been found between the sustainable practices put in place by companies and fraudulent behavior [8]. Following this approach, and as fraud is a very serious global, social and economic problem [9], the present document reviews the latest research related to accounting fraud, shedding light on the factors that induce managers to act unethically and other aspects on which the studies have focused.

Focusing on purely quantitative aspects, the latest report of the ACFE (Association of Certified Fraud Examiners) for the year 2018 states that organizations lose 5% of their annual income because of fraud. This amount, translated into Gross World Product figures, equals 4 trillion dollars [10]. Although, as indicated by this organization, it is unlikely that we can ever calculate the real cost of fraud on a global scale, what is clear is that this expense provides no commercial or social benefit whatsoever.

According to Salleh and Othman [11], among the activities regarded as being fraudulent are the theft of money, omission of information, misuse of company assets, fraudulent acquisitions, misstatements of financial statements (accounting fraud), corruption, conspiracy, money laundering and bribery. Within these fraudulent activities, accounting fraud is of considerable importance, representing 22% of the economic crimes that occur worldwide [12]. This is one of the reasons behind the demand for greater transparency in corporate behavior. An example of this is the requirement for the rendering of accounts to corporate governance and the preparation of a sustainability report, including social and financial aspects [6].

According to the ACFE, fraud can be classified into three main blocks: fraud in financial statements, embezzlement or misappropriation of assets, and corruption, with fraud in the financial statements generating the highest costs, although it is less common than the misappropriation of assets [13]. Examples of these costs are the loss of value for shareholders, creditors, customers and suppliers, or economic damages to employees and governments [14]. According to Sadaf et al. [15], greater control by governments of corruption and political stability could reduce the number of fraud cases. Because of the great costs involved, it would be essential to mitigate the enormous costs of corporate fraud in companies and society in general [16].

The Enron case, which has been one of the most resounding accounting frauds of all time worldwide, showed the need to take regulatory measures in order to avoid this type of case reoccurring in the future. Thus, for example, the Sarbanes-Oxley Act was created in 2002 in the USA and, in the European Union, Directive 2006/43/EC of the European Parliament and the Council came into being in 2006. However, despite this greater governmental concern, there is evidence that companies continue to commit accounting fraud [17], with cases being detected all over the world [18], having a cyclical behavior [19].

Given all this, it is not surprising that there has also been greater interest, from the academic world and governments, to clarify the causes that give rise to accounting fraud. In fact, it has been noted through the present work that the study of accounting fraud has increased widely in recent years [20]. However, there are few reviews of the literature covering this field. Van Akkeren and Buckby [21] analyzed through a qualitative study the perceptions of forensic accountants to determine if the conceptual framework collected in the literature on the subject of fraud, included the causes that can lead to fraudulent behavior by individuals and groups [22]; Botes and Saadeh address the changes that have taken place in the concept of forensic accounting; review misconduct in financial reports from the perspectives of law, accounting and finance [23]; review the concept of “reporting irregularities” in accounting [24]; the skills that the forensic accounting professions should possess to carry out their work successfully [25]; applications of data mining in accounting, indicating the strengths and weaknesses of the same [26]; the application and use of Big Data in auditing [27]; discuss the “Fraud Triangle” [28] and [29]. Ref. [30], who start with a review of the literature on accounting and auditing fraud conducted by Hogan et al. [31], complete it with a discussion of disciplines including

ethics, psychology and criminology, misperceptions of fraud and fraudsters [32], and a review of the literature on the detection of financial fraud using data mining methods [33].

Although all the documents indicated in the previous paragraph are reviews of the literature based on accounting fraud, the analysis undertaken in each of them covers very specific areas.

This article differs from other research summaries of accounting fraud (e.g., [30,31]), as it reviews and updates the literature in a single document, as well as embracing the different topics on which research into accounting fraud has focused.

Based on a review of 156 articles published in the main academic journals dealing with accounting fraud for the period 2000–2018, the following objectives were extracted for the present research: (a) the chronological trend of accounting fraud; (b) the type of research conducted and; (c) the main topics investigated.

Furthermore, from the review, it can be inferred that the areas dealt with by the different authors can be grouped into five major categories. The first category consists of research that analyzes the aspects related to company organization (corporate governance, incentives, rotation of managers, collusion, reporting irregularities, investors) and represents 45% of the total. The second focuses on articles that deal with the role of the auditor, representing 32%. The third group is that which investigates the subject of the Fraud Triangle, covering 10% of the total. The fourth focuses on the use of information technologies for the detection and prevention of fraud (7%), and the last on the topic of the psychological aspects of fraudsters, representing 5% of the total number of articles. These last two categories are the most current trends.

The review allows us to provide a series of contributions to the literature on accounting fraud:

First, the focus on the figure of the auditor as the main person responsible for the detection of accounting fraud has not diminished. There has been greater interest in using artificial intelligence that allows the analysis of large amounts of data and facilitates the detection of accounting fraud.

Second, the Fraud Triangle and its three elements (pressure, opportunity and rationalization) are still used in the investigation of accounting fraud. It is important to analyze the three elements separately in the investigations and combine them with issues related to ethics, values, morals and criminology in order to improve effectiveness in the detection of accounting fraud.

Third, company organization is a very broad field in terms of its relationship with accounting fraud; it is also the area that constitutes the greatest number of articles published in journals. Corporate governance is the most studied topic for which proposals have been made, such as promoting the independence of the board of directors, its size and the separation of the role of the CEO and the chairman from the board to reduce the likelihood of fraud.

Fourth, the psychological aspect of fraudsters is a relatively recent line of research in which personality traits, especially of CEOs are taken into consideration. Narcissism is the most studied aspect in this field.

Fifth, the use of information technology to improve the early detection of accounting fraud in companies has increased in recent years. Applications of artificial intelligence and data mining have emerged, especially in recent years, to help auditors do their job better.

This literature review aims to help researchers better understand cutting-edge research trends in this area and can be used as a starting point for future research. Also, it allows the identification of personality traits that induce fraud, as well as knowing the most innovative detection technologies. Finally, it will allow the identification of types of manager or circumstances with a lack of ethics, and consequently, with tendencies towards fraudulent behavior.

The article has been organized as follows. The first section offers an overview of the research in accounting fraud during the years 2000–2018. The objectives and methodology of the research are specified in the second section. In the third, the results of the analysis are presented. Finally, the conclusions and lines of future research are provided.

## 2. Accounting Fraud: A General Vision

Accounting fraud is a problem that negatively affects the users of accounting information, among which are shareholders, creditors, senior managers and society in general [34]. Even other companies in the same sector experience the negative reaction of the market once the fraud has been detected [35].

There are several definitions of accounting fraud that have been proposed by different organizations. Among them is that established by the SAS (Statement on Auditing Standards) No. 99 (page 1721), according to which it is “an intentional act carried out by one or more persons in the management of the company, its employees or third parties, which results in a misstatement in the financial or accounting statements that are subject to an audit” [36].

On the other hand, the International Auditing Standard NIA 240 (p. 159) [37] defines it as “an intentional act carried out by one or more persons in the management team, those responsible for the government of the entity, employees or third parties, which involves the use of deception in order to gain an unfair or illegal advantage”. According to this norm, relevant errors are considered to be due to both fraudulent financial information and misappropriation of assets. The first involves misleading and intentionally reporting the company’s financial statements, for example, manipulating or falsifying accounting records, or erroneously applying generally accepted accounting principles (GAAP) [38]. On the other hand, asset misappropriation involves the theft or unauthorized use of company assets [39], or causing an entity to pay for goods or services that have not been received (SAS No. 99, p. 4) [36].

As mentioned in the introduction, the lines of investigation in accounting fraud have been divided into five categories. For students of accounting fraud, the role of the auditor has been regarded as one of the main elements in the process, despite the fact that detecting fraud is particularly difficult due to companies’ efforts to hide it [40,41]; therefore, trust in the auditing profession has suffered serious setbacks in recent years [42]. Despite this, internal auditors are more easily able to detect misappropriation of assets, while for external auditors, fraud in the financial statements is easier to track [43]. However, the auditing role continues to represent a greater guarantee against accounting fraud, especially when there is such little research work related to dissuasive measures, despite the enormous costs involved in this type of fraud [44]. Their adequate academic training and experience in detecting fraud [45] and due exercise of an appropriate professional skepticism [46] are elements that must be taken into account for optimum performance in their work.

On the other hand, the Fraud Triangle and its three interactive elements (pressure, opportunity and rationalization) are common to all frauds [47,48], and those related to accounting are not an exception. Despite its importance, different authors do not agree on which of its three elements is most important. For some [28,49], the emphasis is on the opportunity. Others, however, claim that the Fraud Triangle should not be seen as a sufficiently reliable model for anti-fraud professionals, since fraud is a multifaceted model [50]. What the authors do seem to agree on is the need to break it down into its three elements for assessing the risk of fraud [44]. Trompeter et al. conducted a comprehensive review of this construct in accounting and non-accounting research, complementing it with other fields such as criminology, ethics, psychology and sociology [29].

The relationship between accounting fraud and organizational aspects of the company has also been widely studied. Accounting, auditing and financial information and corporate governance are related (e.g., [51,52]). The influence of incentives in the performance of managers (e.g., [53]), the relationship between corporate governance and sustainability [54], the rotation of managers in fraudulent companies (e.g., [55–57]), professional connections between managers (e.g., [58,59]), collusion (e.g., [60]), the role of employees in detecting fraud (e.g., [34]), the use of internal and external telephone lines (e.g., [61,62]), the integration of ethics with finance and accounting (e.g., [63]), and investors and the use of the company financial information to detect fraud (e.g., [17,64,65]).

On the other hand, the investigation of the psychological factors related to fraud is a recent study trend. According to Ramamoorti and Olsen [66], understanding them could shed light on the

understanding of the behavior of fraudsters. Thus, the narcissism of the CEO has been studied as a psychological trait that correlates positively with fraud [67–69].

Finally, the use of information technologies is a trend that seems to be breaking through in the study of accounting fraud. New technologies seem to favor fraud, but also provide more sophisticated detection techniques [70]. Data analysis (e.g., [71]), support vector machines (e.g., [72]), blockchain [73] and data mining (e.g., [26,74,75]) are some of the techniques used. In this same line, corporate governance should also use a systematic approach to investigate fraud in a company. This means using appropriate software to detect unusual activities [52].

### 3. Methodology of the Review

Our work is based on a review of the literature or meta-analysis of articles published in high-impact journals during the period between 2000 and 2018 with an accounting- and/or auditing-related topic in order to identify interesting new research. The search was done through the Web of Science, reviewing articles with the word “fraud” in the title during the indicated years. The initial search generated 6989 results for the year 2000; however, refining the results with the filters “Business Economics” (Research area) and “Article” (Type of document), the result was reduced to 2888 articles. We focus on the findings related to accounting fraud in these documents. Since the literature in this field is voluminous, we went through a painstaking selection process about the specific articles and themes, which finally lead us to selecting 156 articles. This methodology has also been used by several other authors who have also undertaken literature reviews for their research (Carcello, Hermanson, and Ye, 2011 [76]; Lee and Xiao, 2018 [77]; Schnatterly, Gangloff, and Tuschke, 2018 [78]).

To analyze how the 156 articles analyzed were distributed among the five categories, all the articles were first reviewed and then divided, according to the main theme, into five subject areas (Auditors, Fraud Triangle, Corporate Governance, Psychological Aspects, Information Technology). For each area, a specific computation was made of the total number of articles found and finally the tables below were drawn up based on the authors, year of publication and the main conclusions of each article.

### 4. Analysis of Investigation in Accounting Fraud

Chronologically speaking, the investigation into the issue of accounting fraud experienced an exponential growth during the analyzed period, increasing from one article in the year 2001 to 16 articles in the year 2018 (Figure 1).

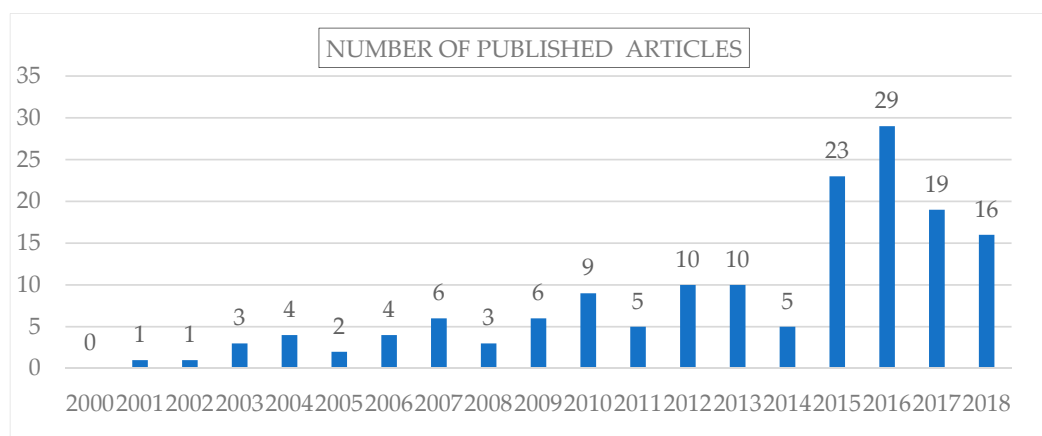
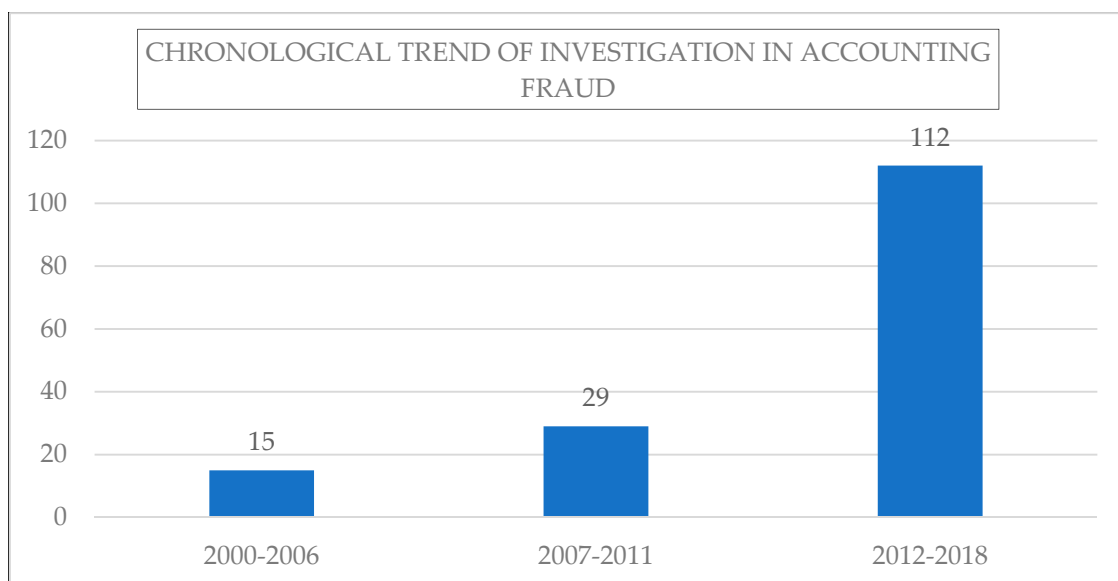


Figure 1. Number of articles published per year.

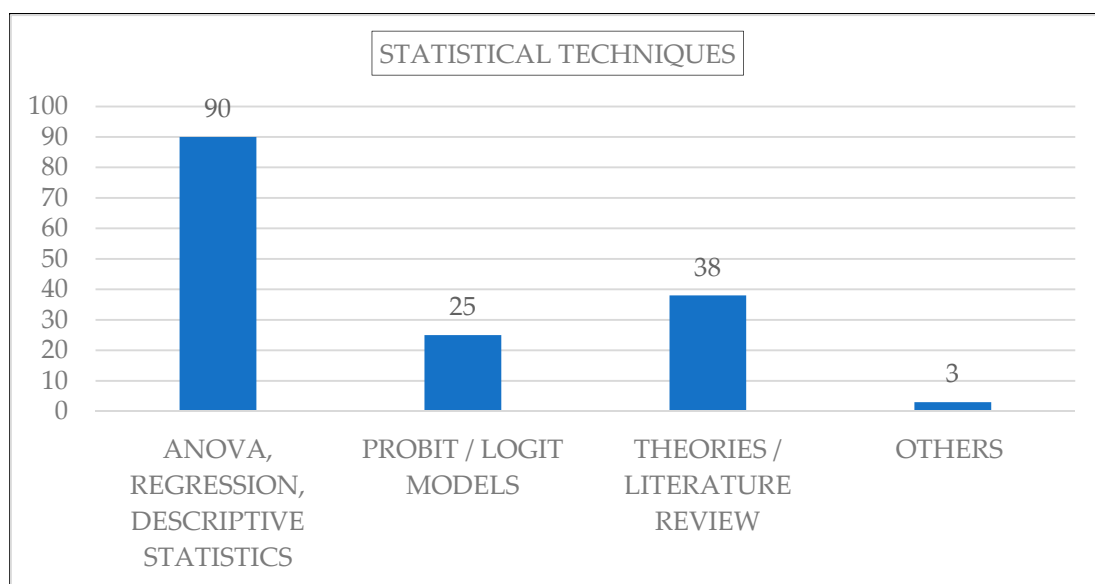
Therefore, there is clearly growing interest in the subject of accounting fraud, especially between the years 2012 and 2018, in which the number of articles published almost tripled with respect to that of previous years (Figure 2).



**Figure 2.** Trend in the publication of articles on accounting fraud (2000–2018). Source: The authors' own elaboration.

#### 4.1. Statistical Techniques Used in the Investigation of Accounting Fraud

The articles included in the review used a wide variety of statistical techniques (Figure 3), most notably the ANOVA analysis (e.g., [68,79,80]), descriptive statistics (e.g., [81,82]) and regression (e.g., [83,84]). These three techniques, along with the use of logit/probit models (e.g., [85,86]), account for almost 80% of the articles reviewed. The rest are mostly theoretical works (e.g., [87–89]). The section “others” includes two articles that use structural equations ([90–92]) and one that, instead of using ANOVA, used Contrast of Weighting (Buckless and Ravenscroft, 1990) ([93]).



**Figure 3.** Techniques used in articles. Source: The authors' own elaboration.

#### 4.2. Topics, Temporary Trends and Main Findings Studied in Accounting Fraud

As mentioned above, if the 156 articles are classified by the main topic on which the research focused, we find that they can be grouped into five categories (see Figure 4):

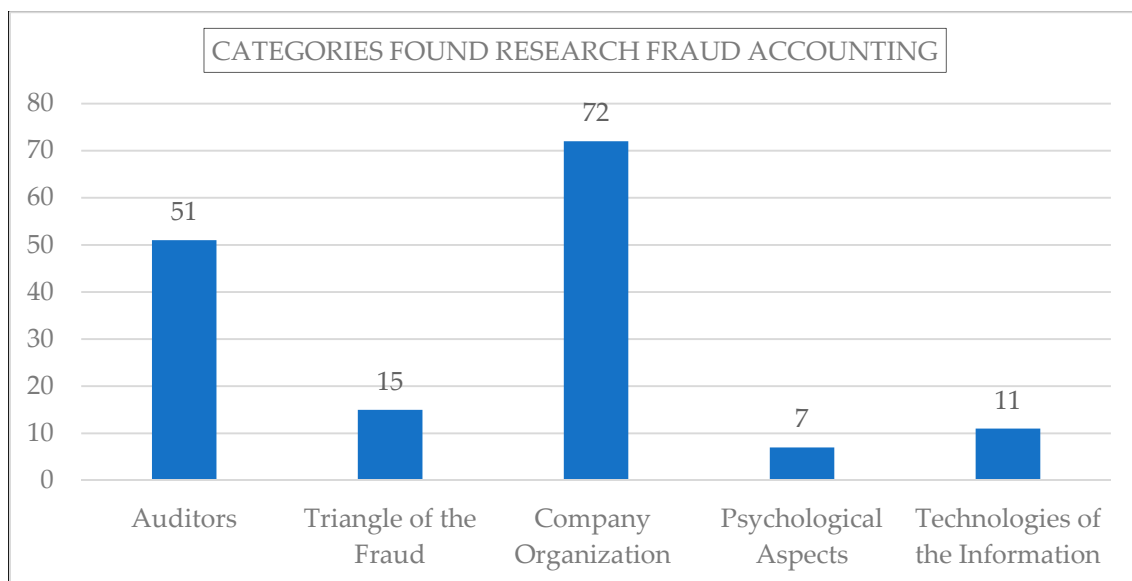


Figure 4. Classification of articles in 5 categories. Source: The authors’ own elaboration.

The temporary trend in the evolution of accounting fraud as a subject area has clearly been on the rise. Nevertheless, as the figure (Figure 5) indicates, the period 2012–2018 clearly accounts for the majority of the articles. The area that had most coverage was “Company Organization”. The next most studied subject was “Auditors”, with articles appearing throughout almost the whole analyzed period. As for the third subject, that is, the “Fraud Triangle”, the articles center fundamentally on the period 2013–2018. The articles on the topic of “Information Technology” appear from the year 2012 and reach a high between 2015 and 2018. The subject of “Psychological Aspects” appears in 2007, but it should be highlighted that this area is the least covered.

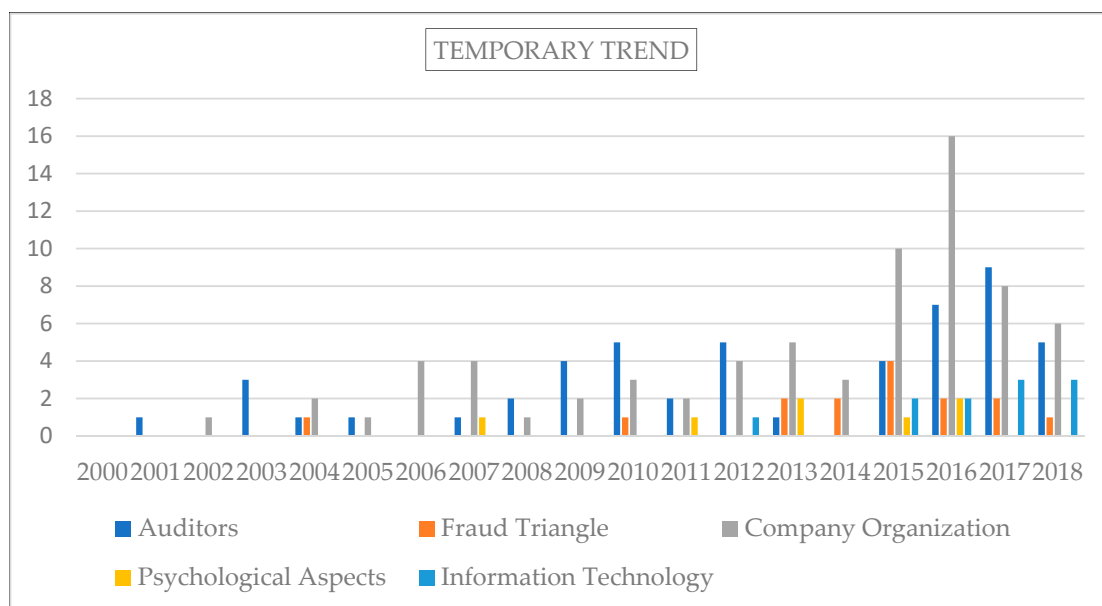


Figure 5. Temporary trend of accounting fraud issues. (Source: The authors’ own elaboration.)

The following sections provide five tables with a chronological list of the articles included in our review, detailing the research topic, the author, the year of publication and the main conclusion. Along with each table, a brief review of the main issues that the literature gathers in each of the five categories can be found.

#### 4.2.1. Auditors

For auditors, detecting fraud can be a difficult job, mainly because it is an act that is intended to be hidden and, although fraud prediction models are available, they are not totally reliable [33,83]. To assist the auditor in carrying out his/her work, he/she is required to conduct “brainstorming” tasks as a means to develop robust ideas of a potential client fraud [84–87]. The current audit standards indicate this (SAS No. 99), although they do not clarify which specific form of the brainstorming process must be used [94]. What is specified is that “the members of the auditing team should use the brainstorming tool to find out how and where they believe that the entity’s financial statements could be susceptible to errors due to fraud and how the administration could commit and conceal fraudulent financial information” (AICPA 2002, 10). This may explain the different amount of brainstorming processes that have been used in the articles reviewed [89–91].

Fraud does not favor the auditing profession [43], and organizations such as ACFE express their concern about the lack of success auditors have in detecting fraud. Auditors can only succeed if the factors that contribute to fraud are eliminated or help them to be more effective in detecting fraud [87].

Therefore, auditors require tools that can help them in the performance of their work, such as the possibility of consulting with fraud specialists, or having lists of standard risk factors for fraud [93,94]. In fact, auditors seem to be more motivated to use the work of the specialists, out of respect for the authority they perceive [95]. On the other hand, some researchers point out that the use of checklists by auditors makes them less critical in their study of financial statements [96].

Hamilton proposes that auditors use the client’s perspective, that is, take into account the circumstances that the client was facing when preparing the financial statements, especially if there are indications of intentional misstatements [97].

According to Bazrafshan [98], the most important risk components in companies for auditors are those related to the misappropriation of assets. Although fraud due to asset misappropriation has received very little attention in research, some authors [36,94] clarify that external auditors investigate fraud by focusing on financial statements, while internal auditors cover a greater variety of frauds, including asset misappropriation. This type of fraud is not negligible, and it is estimated that 6 percent of the income of US companies in 2002 was lost through the same [99].

This situation highlights the need to establish adequate internal control systems as measures to prevent fraudulent financial information [100,101]. These control systems include internal audits, the introduction of responsibilities for employees in the accounting area, or the use of control measures based on information technologies [102].

According to the ACFE (2010), 80% of the companies that have been victims of fraud have modified their internal controls and taken measures accordingly; among such measures are performing surprise audits, increasing the division of tasks among employees, or establishing a code of conduct.

On the other hand, it is more likely that studies that evaluate the importance of having as part of the corporate management an internal audit function detect fraud and self-report the misappropriation of assets [82]. The relationship between corporate governance and the areas of accounting and auditing has increased in recent years. The importance of the CEO and CFO (Chief Financial Officer) [76] being jointly supervised by the board and the company’s auditing committee is highlighted. It is very positive that strong corporate governance is complemented by a strong auditing board in order to decrease the likelihood of fraud. On the other hand, other authors state that outsourcing the auditing function is better than internal auditing for detecting this type of fraud [95,96].

Furthermore, it has been noted that part of the literature focuses on the role of the auditors regarding the motivation they have in detecting fraud taking into account the threats of legal action against them. Along these lines, the research of Reffett [92] and Eutsler, Nickell and Robb [86], using the Theory of Counterfactual Reasoning, concludes that auditors can be penalized and have legal action taken against them for not detecting fraud, even though they have investigated it. This is because those who evaluate their work (Congress and the United States Securities and Exchange



Commission (hereinafter SEC)) could draw the conclusion that the auditors have been negligent in their investigation and could have done things differently (Counterfactual Reasoning).

Table 1 offers a summary of the main contributions found in the articles reviewed based on the auditors.

**Table 1.** Category: Auditors. (Main conclusions drawn on the figure of the auditor in the articles reviewed).

Author/Year	Main Contribution
Knapp and Knapp, 2001 [41]	Audit managers are more effective at assessing fraud risk than senior auditors.
Patterson and Wright, 2003 [103]	The responsibility and capacity of the auditor to evaluate the probability of fraud and how that evaluation is used in the planning of the audit is studied.
Patterson et al., 2003 [104]	The auditor's responsibility may influence the audit.
Glover et al., 2003 [105]	The importance of modifying audit plans in response to changes in the risk of fraud.
Asare and Wright, 2004 [81]	Need for a strategic reasoning approach when addressing standard fraud risk assessment tools.
Firth et al., 2005 [106]	Auditors are more likely to be penalized for not detecting and reporting fraud related to material errors (exaggeration of income / assets, fictitious transactions) than with the disclosure of false financial information.
Carpenter, 2007 [107]	The brainstorming sessions of the audit teams generate more quality ideas about fraud than individual auditors.
Albrecht et al., 2008 [87]	Eliminating the factors that contribute to fraud (Fraud Triangle) or helping auditors in their detection would help detect fraud more successfully.
Kerler and Killough, 2009 [108]	Organizations with corporate governance in their internal auditing functions are more likely to detect fraud and self-report misappropriation of assets than those that do not.
Hoffman and Zimelman, 2009 [93]	Strategic reasoning and the exchange of ideas within groups of auditors lead to more effective modifications of standard auditing procedures.
Brazel et al., 2009 [109]	Auditors can effectively use non-financial measures to evaluate the reasonableness of financial results and detect fraud.
Trotman et al., 2009 [110]	The interaction of groups of auditors for brainstorming with guidelines generates a greater quantity and quality of ideas of fraud than those groups without specified guidelines.
Hammersley et al., 2010 [111]	The particularity of the documentation of fraud risks, discussed during the brainstorming session, influences fraud risk assessments and test evaluation decisions.
Hunton and Gold, 2010 [112]	The results of three types of brainstorming groups for fraud evaluation are examined: nominal, round robin and open discussion.
Brazel et al., 2010 [113]	Based on SAS No. 99 and previous research in psychology, the authors develop a brainstorming model auditors can use for detecting fraud.
Strand et al., 2010 [114]	Internal auditors perceive more personal threats when reporting to the fraud risk audit committee, than when reporting to the top levels of the company.
Reffett, 2010 [92]	Auditors are more likely to be held responsible for not detecting fraud, even when they have investigated it, than otherwise.
Carpenter et al., 2011 [100]	The homogeneous groups of internal brainstorming auditors identify fewer frauds but with higher quality (real fraud according to SEC) than a group of internal auditors who evaluate individually (nominal group).
Hammersley et al., 2011 [115]	When the risk of fraud is greater, the auditing programs of internal auditors are of lower quality.
Trotman and Wright, 2012 [79]	Auditors use information about the client's business model to assess the risk of fraud.
Simon, 2012 [94]	The identification of fraud schemes for auditors is a complex task for at least three reasons. (1) The client hides it. (2) Auditors do not have extensive experience. 3) They do not know how to detect signs of fraudulent information.
Brody et al., 2012 [32]	Summarize the Annual Meeting of the American Accounting Association (2011) on: the common misconceptions about fraud and forensic accounting, the lack of articles related to these topics and the opportunities for future research.

Table 1. Cont.

Author/Year	Main Contribution
Gold et al., 2012 [116]	The propensity of auditors to consult obligatorily with experts in fraud would be greater if there were a high risk of fraud and there were the added pressure of a deadline for the audit.
Smith et al., 2012 [117]	The factors that contribute to the greater effectiveness of electronic brainstorming for stopping fraud because of a more specific focus are analyzed.
Gullkvist and Jokipii, 2013 [118]	They examine the difference in the perception of the importance of network flags among internal auditors, external auditors and economic crime investigators.
Markelevich and Rosner, 2013 [119]	The relationship between the different types of auditor fees (total, audit and other services) and fraudulent financial information is considered. Companies that pay high total fees and other services to auditors are more likely to be penalized for fraudulent financial statements.
Popoola et al., 2015 [120]	The participation of fraud specialists in the planning of an auditing job with a risk of fraud, involves an additional effort in time and costs without there being a clear benefit commensurate with the effort.
Boritz et al., 2015 [80]	Examine whether large audit firms reduce the incidence of fraud in China's financial statements. The results highlight the role of government sanctions to ensure the quality of the audit.
Lisic et al., 2015 [121]	Examine whether large audit firms reduce the incidence of fraud in China's financial statements. The results highlight the role of government sanctions to ensure the quality of the audit.
Chen et al., 2015 [101]	"Sequential" brainstorming leads to a greater quantity and quality of the potential frauds identified by auditors, compared with the simultaneous brainstorming.
Bazrafshan, 2016 [98]	The views of auditors and university students on the risks of fraud and its importance are compared. The misappropriation of assets is considered the most remarkable by the auditors, whereas the students believe it to be the management characteristics and the industry conditions.
Eutsler et al., 2016 [86]	Theory of Counterfactual Reasoning. Auditors may be penalized for not documenting the risk of fraud if later it is discovered that the financial statements were fraudulent.
Hamilton, 2016 [122]	The auditor should take into account the client's perspective when preparing the financial statements if he/she suspects that there is an intentional erroneous statement.
Zager et al., 2016 [123]	Internal controls have a significant impact on the prevention of fraudulent financial information.
Gong et al., 2016 [19]	The frequency of fraudulent crimes has a cyclical behavior.
Coram et al., 2008 [82]	Changing the auditing method makes it possible to prevent the audited companies from taking advantage of the weaknesses inherent in any methodology.
Okat, 2016 [124]	"Sequential" brainstorming leads to a greater quantity and quality of the potential frauds identified by auditors, compared with the simultaneous brainstorming.
Imoniana et al., 2016 [43]	An internal claim channel and internal compliance rules are better at detecting corruption and misappropriation of assets. External auditors are better at detecting fraud in financial statements.
Hamdan et al., 2017 [45]	They recommended having good academic qualifications and experience in issues related to fraud in order to improve the detection of fraud.
Reid and Youngman, 2017 [125]	A study is carried out on the importance of publicly disclosing the company responsible for conducting the audit, as well as any other company that participates in the same.
Donelson et al., 2017 [126]	Having the opportunity to deceive senior managers of weak internal controls is associated with an increased risk of fraud in financial reporting.
Tiwari and Debnath, 2017 [25]	Forensic accountants must have specific training in accounting and personal skills to perform their work properly.

Table 1. Cont.

Author/Year	Main Contribution
Wei et al., 2017 [72]	The manipulation of asset accounts is more frequent than the inflation of liabilities when it comes to adulterating financial statements.
Lail et al., 2017 [127]	The “virtuous” professional accountant (justice, wisdom, courage, motivation) is proposed with preventing fraudulent behavior in accounting and financial systems.
Perols et al., 2017 [71]	Two models are proposed that improve the prediction of fraud by 10%.
Atagan and Kavak, 2017 [128]	Survey of public accountants in Turkey to analyze their opinions on fraud and forensic accounting in their country and in the rest of the world.
Van Akkeren and Buckby, 2017 [21]	A qualitative study is carried out, using the perceptions and experiences of forensic accountants, to determine the accounting fraud carried out by individuals and groups.
Juric et al., 2018 [129]	Young male public certified accountants have a greater predisposition to engage in fraudulent behavior and the sanctions imposed on them by the SEC are also superior.
Wilson, McNellis, & Latham, 2018 [130]	The mandatory non-rotation of the audit firm is proposed, since the permanence of the auditor generates trust among the employees and this encourages the reporting of irregularities.

Source: The authors’ own elaboration.

#### 4.2.2. The Fraud Triangle

The term “Fraud Triangle” was coined long after Cressey’s work; it was Joseph Wells, founder of the ACFE, who popularized it [28], replacing the notion of an unshared problem, indicated by Cressey, with that of pressure [131]. The use of the same in the field of forensic accounting and in the examination of fraud has increased significantly [132].

According to Haefele and Stiegeler [133], the commission of “white collar” crimes, especially accounting fraud, usually follows the same pattern, which researchers have called the Fraud Triangle. The investigation into the risk of fraud has used the Fraud Triangle and the interaction of its three components as elements common to all frauds. These elements are: (1) incentives or perceived motivation, (2) the perceived opportunity and (3) the attitude or character that allows a person to rationalize the act of fraud [134].

Thus, the Fraud Triangle is presented as a credible methodology that allows fraud specialists to speak with authority and intervene, in a certain way, in organizational fraud [28]. Of the three elements indicated, some authors have conducted studies in which the opportunity is considered a universal precondition for acts defined as fraudulent [20,41].

Although it is highlighted in the investigations carried out that the three elements, indicated above, are important and necessary in the study of fraud, the decomposition of the same into fraud risk assessments increases the sensitivity of auditors to detecting the same [99,135].

The study of accounting fraud, using the Fraud Triangle tool, has been enriched and combined with contributions from other disciplines, such as ethics, morals and values [123,126], criminology, psychology and sociology [21,130], or combined with other frameworks such as the Crime Triangle (Mui and Mailley) [136].

However, according to [50], the Fraud Triangle should not be seen as a sufficiently reliable model for anti-fraud professionals, since fraud is a multifaceted phenomenon with contextual factors that may not always fit into a particular framework.

Table 2 offers a summary of the main contributions found in the articles reviewed with the topic “Fraud Triangle”.

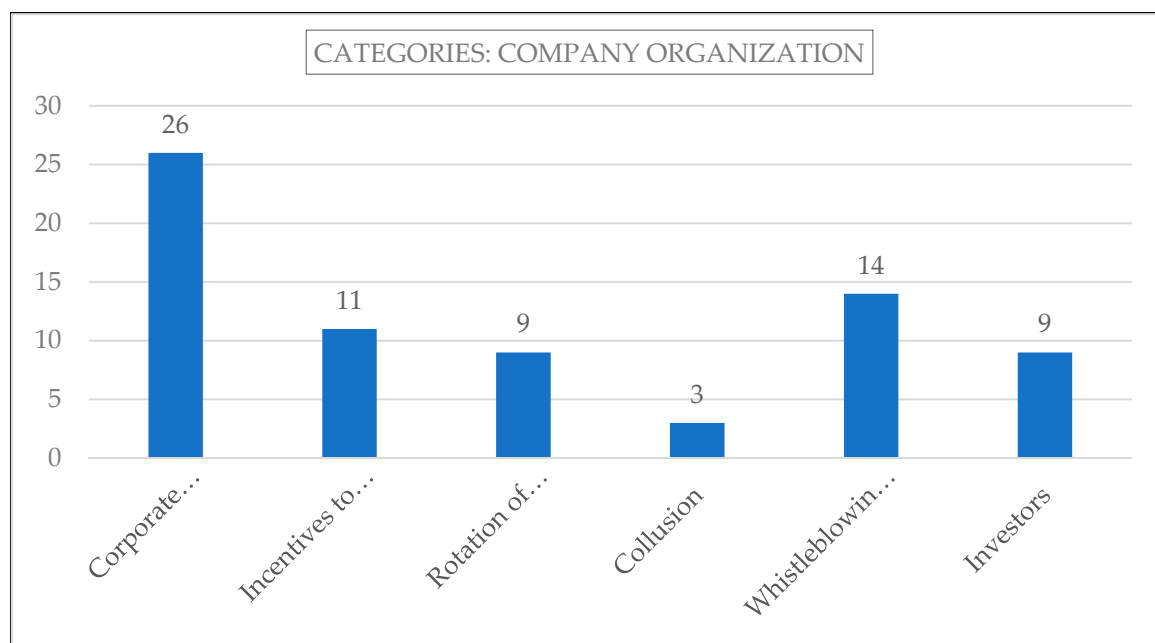
**Table 2.** Category: the Fraud Triangle (Main conclusions drawn on the topic of the Fraud Triangle in the articles reviewed).

Author/year	Main Contribution
Wilks and Zimbelman, 2004 [137]	Decomposition of the Fraud Triangle into its three elements to increase the sensitivity of auditors to detect fraud.
Cohen et al., 2010 [138]	The Fraud Triangle and the Theory of Planned Behavior are integrated in order to detect the risk of fraud.
Trompeter et al., 2013 [30]	The publications on accounting and related disciplines are reviewed (criminology, ethics, finances, organizational behavior, psychology, sociology). The Fraud Triangle is combined with corporate governance and internal controls in the company.
Favere-Marchesi, 2013 [139]	The decomposition of fraud risk assessment into its three elements is a preferable method to assess the general risks of fraud.
Morales et al., 2014 [28]	The Fraud Triangle is presented as a credible technology for the study of organizational fraud. The opportunity is the primordial element.
Trompeter et al., 2014 [29]	Review of the literature on the constructions of the Fraud Triangle both in accounting and non-accounting (neutralization and rationalization).
Mui and Mailley, 2015 [136]	Propose the application of the Crime Triangle Theory (which studies the environment), to fraudulent situations as a complement to the Fraud Triangle.
Andon et al., 2015 [140]	Establish the importance of the attitude towards the situation in regard to fraudulent behavior.
Lokanan, Mark E., 2015 [50]	Fraud is a multifaceted phenomenon and the Fraud Triangle should not be seen as a sufficiently reliable model for anti-fraud professionals.
Schuchter and Levi, 2015 [49]	Consider that opportunity is the most important condition in fraudulent acts. Financial incentives should not lead to committing accounting fraud.
Rodgers et al., 2015 [141]	An Ethical Thinking Process Model is used, embedded in the Fraud Triangle, in order to better understand the interconnection of ethical positions and internal control systems to handle fraudulent situations.
Haeefele and Stiegeler, 2016 [133]	Those who commit “white collar crime” usually do so following the same pattern: motivation, opportunity and subjective justification.
Chen et al., 2016 [142]	Study the role of the financial analyst in corporate fraud in China within the framework of the Fraud Triangle. The financial analyst reduces the opportunity but increases the incentive to committing fraud. The influence on rationalization depends on how much the company depends on the capital market for finance.
Reinstein and Taylor, 2017 [143]	The influence of ethics, morals and values is studied as obstacles in the rationalization of accounting fraud.
Machado and Gartner, 2017 [47]	The theoretical framework of the theory of the agency, of criminology and of the economy of crime is combined with the Fraud Triangle to study the occurrence of corporate fraud in Brazilian banking institutions.

Source: The authors' own elaboration.

#### 4.2.3. Company Organization

Most of the articles analyzed were concentrated in this group, representing 47% of the total articles. Due to the heterogeneity of the perspectives addressed in this area, it was considered necessary to structure the articles reviewed in six categories (Figure 6):



**Figure 6.** Subcategories of the subject “Company Organization”. (Source: The authors’ own elaboration).

#### Corporate Governance/Board of Directors

The fraud committed by a company’s top management can be considered a subset of the so-called “white collar crimes”, among which are embezzlement, insider trading, intentional distortion in the financial statements and corruption. The consequences affect shareholders, employees and the community through a decrease in the share price, as well as the loss of confidence in the company and in its top management [144]. It even has side effects for other companies that belong to the same industry, such as an increase in the fees of auditing companies and greater scrutiny by auditors on financial information processes [145].

There is no doubt that the pressure to maintain good financial results can tempt managers to commit accounting fraud, even though these results do not correspond with reality [146]. Managers of companies are more prone to accounting fraud when the stock price has remained sustained for a period of up to five years [147].

The characteristics of the board of directors and the corporate governance of the company are correlated with the occurrence of fraud [85]. In this sense, one of the first research papers in which corporate governance was related to fraud was presented by Beasley [148]. This shows that the presence of independent directors, or those external to the company, significantly reduces the likelihood of fraud. As the percentage of independent directors on the board increases, the double role between CEO (Chief Executive Officer) and BOD (Board of Directors) should be separated. This would reduce the agency costs, because such power and influence would not fall on one person. Sharma finds that if this double function is not separated, then the probability of fraud increases [149], and companies will remain internally weak [150].

However, Halbouni et al. [44] state that, in the United Arab Emirates, corporate governance has a moderate role in preventing and stopping fraud. In addition, these same authors conclude that CEOs and boards of directors must adequately establish the tone and ethical climate (tone at the top) to generate an environment of integrity and ethics in the company. The establishment of codes of ethics by senior management and the board of directors is essential as an integral part of Corporate Social Responsibility [151]. Financial statements must be prepared ethically, since compliance with accounting standards does not necessarily guarantee ethical reports in all contexts [152]. Along these lines, Carcello, Hermanson, and Ye [76] propose the establishment of ethical measures monitored by the CRO (Chief Risk Officer), CCO (Chief Compliance Officer), CEthO (Chief Ethics Officers), duly

informing the audit committee. Contrary to the above Tan, Chapple and Walsh [153] indicate that the role of corporate governance in reducing fraud is only significant for companies that have a culture of fraud.

On the other hand, some research highlights the importance of the improvements that occur in companies after the discovery of fraud [30,114]. Thus, companies that significantly reduced the percentage of internal executive directors and increased the percentage of external directors in their meetings saw their reputation improve in the market. Farber [73] ensures that the perceptions that investors have about improvements in the corporate governance of the company after fraud can generate an increase in the price of shares [84].

Another line of research is that followed by Cumming, Leung and Rui [154]. They examine how the gender diversity of the board of directors has an effect on the likelihood that the company will commit fraud. Their study establishes three interesting conclusions: (1) gender diversity in the board of directors acts as a significant moderator for the frequency of fraud; (2) the response of the stock market to fraud, in the case of a board with diverse gender, is much less pronounced; and (3) women are more effective in industries dominated by men at reducing the frequency and severity of fraud. Therefore, increasing the representation of women in boardrooms can help reduce fraud [155].

With regards demographic characteristics such as professional experience, age and academic background of the CEO, it has been concluded that younger CEOs with less academic background and experience are more likely to rationalize accounting fraud and see their acts as ethical and justified [38]. If the demographic characteristics of the CEO are added to unbalanced corporate strategies, there is more likelihood of committing fraud, as this type of strategy harms the financial strength of the company, making fraud the easy way to obtain additional resources [156].

On the other hand, the ownership structure of the company (dispersed/concentrated) also influences the type of fraud that occurs. In this way, corporate governance, designed to protect the interests of shareholders, cannot work in the same way in both types of companies [157].

Finally, it has also been shown that the frequency with which corporate governance meetings take place can help owners, auditors and the general public to identify fraud in companies early on [11].

At this point, it is important to clarify two important aspects related to the size of companies and endogeneity in corporate governance investigations.

Most of the articles analyzed related to this subcategory do not make reference to the importance of the size of the company in their empirical investigations. Thus, the measurement of the size of the company should be taken into account as a key variable or control by researchers in corporate finance [158]. In this sense, the work of Dang, Li and Yang focuses on the study of the importance of the size of the company in 20 areas of corporate finance. To do this, they analyze three measures of size: total assets, total sales and equity market value, since they are the proxies of companies most used in corporate finance. Using these three measures, they conclude that large companies tend to have more external directors, larger boards and more duality of the CEO (separation between CEO and chairman of the board (COB)); thus, this work is to be considered by researchers in corporate finance who need to measure the impact of the size of the company. We recommend researchers in corporate finance consult the article indicated, since it provides a guide for choosing the size of the company in their empirical studies.

On the other hand, research on corporate governance is plagued by the problem of endogeneity, which can bias the claims that researchers make about the hypotheses raised in their studies. Much of the research assumes that the corporate governance variables are exogenous and yet the characteristics of the company can also affect the characteristics of the board of directors, at this point they become related with the phenomenon that is being studied [76]. This endogeneity occurs when an independent variable correlates with the error term in a regression model of ordinary least squares. To address this problem, Li [159] proposes different econometric models to analyze the relationship between the power of the CEO and the subsequent performance of the company, observing a negative relationship between said variables. Furthermore, Semadeni, Withers and Trevis [160] propose instrumental

variables techniques to alleviate this problem; whereas Garcia-Castro, Ariño and Canela [161] study how endogeneity problems affect the positive relationship found between the company's social performance and financial performance. If endogeneity is taken into account, this relationship becomes non-significant or even negative [162]. Finally, Wintoki, Linck and Netter [162] find no relationship between the current structure of the board and the current performance of the board, which is inconsistent with previous work.

It is clear that the challenge for researchers is to develop appropriate variables to investigate corporate governance avoiding the problem of endogeneity.

### Incentives to Management

The relationship between executive incentives and fraud has been widely studied, and among the conclusions drawn is that whereby performance-based compensation can induce managers to misreport their performance and influence their own salary. In this way, there is a clear relationship between CEO compensation and accounting fraud [80–100], with it being more common in private companies [83]. Therefore, the opportunity offered by the asymmetry of information is sufficient for CEOs to present fraudulent financial reports [163].

In keeping with previous work, Johnson, Ryan and Tian, [53] analyze corporate fraud as an undesired result and one associated with managerial incentives. The framework they use for their analysis is Becker's Economic Theory (1968) of the crime framework. According to these authors, the agents commit a crime because the reward they expect outweighs the punishment in the event that they were discovered. Thus, in the work of Sen [88], it is concluded that there is a clear de-compensation between the profits that derive from the fraud and the penalties imposed. Contrary to this idea, Erickson, Hanlon and Maydew [164] find no consistent evidence that executive incentives are associated with fraud.

Finally, it should be mentioned that in recent years, and as a deterrent, companies have tried to mitigate the dysfunctional effects of the use of incentives using reintegration clauses in cases of fraud, which seems to have had an effect on the behavior of executives, by discouraging or penalizing them [165].

### Rotation of Directors/Connections of Managers

The relationship between fraud in companies and the rotation of their managers is an obvious and contrasted fact [19,47,120]. Thus, in the work of Persons [57], which was carried out on 224 fraudulent companies judicially sued in the United States, it was highlighted that, in general, there is a greater turnover of executives in said companies, with their compensation being less.

How the professional connection of managers and directors in companies reduces accounting fraud, while non-professional connectivity increases the propensity to fraud has also been studied [59].

As previously mentioned, although the presence of external directors on the board reduces the likelihood of fraud, it seems that the complaints for this reason have significant reputational consequences for these directors, and also have a negative effect on the management positions that they hold in other companies [166]. This loss of reputation is suffered not only by the directors but also by the companies themselves, leading to investors also "punishing" them for their damaged reputation [127,128].

Despite the reputational damage that fraud can cause, a series of mechanisms have been established to prevent fraud in financial statements. Thus, for example, the Sarbanes-Oxley Act (SOX) establishes regulations that suppose an increase in the internal control of evaluations by auditors and also an increase in the severity of sanctions against the management of inaccurate financial information. Thus, Ugrin and Odom [167] indicate that the potential threat of time in jail may deter fraud in financial statements, although its effectiveness is influenced by social, environmental and demographic factors. According to McEnroe [168], it seems that executives do not perceive that SOX is an effective deterrent, and they assert that labor market forces and social discredit are more effective than the possibility of going to jail.

Trying to alleviate the situation derived from fraud and its consequences in the management of the company, Marcel and Cowen [169] propose two mechanisms to redirect the post-fraud business volume of the company. One involves repairing the legitimacy of the organization to avoid the withdrawal of resources and the other, increasing the individual effort of the directors to safeguard their own reputations and mitigate their professional devaluation

### Collusion

Fraud in financial statements is characterized, among other aspects, by the fact that it can be hidden through collusion between management, employees or third parties. Management can also ignore or instruct others to overlook effective controls of this type of fraud [36].

Collective fraud (collusion) has hardly been studied. Proof of this is that of the 156 articles analyzed, only 3 deal with this area [49,131,132].

Free and Murphy [60] explain that fraud has a social rather than an individual nature, and that this aspect is key to understanding its etiology and some of its distinctive features. Aspects such as loyalty, trust and distrust can consolidate a group and provide reasons to co-commit and rationalize fraudulent behavior. Albrecht et al. [48] analyze how senior management can influence other individuals into committing fraud in financial statements through five types of power—reward, coercive, expert, legitimate and reference—having detected the use of all of them in the research carried out.

Khanna, Kim and Lu [58] show how the previous relationships between CEOs and directors or senior executives of a company, either through previously established personal links or by influencing the latter in the decision of their appointment, are associated with a greater probability of fraud. This is more difficult to detect and is carried out over a longer period of time.

### Whistleblowing and Media

In 50% of the cases, employees are the most common means for detecting fraud. Sources external to the company, such as customers and vendors, accounted for 34%, and the rest came from the review of the company management and internal audits [13]. Thus, according to the ACFE survey (2010), reporting irregularities is the simplest method of detecting fraud. Gao and Brink have reviewed existing literature on this concept [24]. Furthermore, Wilde [170] provides evidence of how companies with mechanisms for reporting irregularities available to employees reduce the performance of incorrect financial reports and fiscal aggression. Along the same lines, Johansson and Carey [171] have also analyzed the same for small businesses drawing similar conclusions.

Among the mechanisms that employees can use to report irregularities in the company is the implementation of a hotline [62]. However, although employees are often aware of the existence of such mechanisms, they do not use them [134,139]. Thus, 82% of those who reported the fraudulent behavior of their company were dismissed or resigned under duress, and thus, many affirmed that if they had to do it again they would not [34].

On the other hand, some authors have studied the acts employees are most willing to report [137,143]. They found that employees are more likely to report acts involving the appropriation of assets than the existence of fraudulent financial information. It seems that employees perceive that the appropriation of assets supposes a personal benefit for the one who commits it. On the contrary, fraudulent financial information is observed as something that benefits the organization, to protect its employees and shareholders.

Accounting fraud has attracted public attention, and the press seems to play an important role in its dissemination, among other aspects, due to the pressure that it exerts on management [172]. Miller [173] states that business press investigates particularly technical information in order to subsequently prepare reports. He highlights the role as the same as that of a “watchdog” providing a better analysis than the non-business press, whose main purpose is only to retransmit the fraud.



## Investors

Large accounting scandals have been detected throughout the world [174], with investors being one of the most affected parties, as well as being those for whom it is most difficult to detect the fraud. For this reason, the SEC is interested in training investors to be familiar with warning signs (red flags) that could help protect them from fraudulent financial information. Among these signals, investors focus, fundamentally, on SEC investigations, the existence of pending litigation or high turnover in the management of the company [65]. In addition to these signals, investors use the information provided by business analysts, as they act as intermediaries between the information provided by management and themselves [17]. On the other hand Wu, Johan and Rui [175] point out that groups of shareholders with a large number of shares in their possession (institutional investors) can reduce the incidence of fraud through their supervision and influence on the management of the company, which will also benefit small investors. Additionally, they contribute that if, in addition, the managers of the companies have political connections, the legal actions to which the company would be exposed for fraud would be diminished.

Finally, regulators and auditors should remain alert to periods of economic boom, since, in this case, the probability that a company will commit fraud is greater. This is because the mechanisms of internal surveillance of companies are relaxed [78,141].

Table 3 offers a summary of the main contributions found in the articles reviewed with the topic “Company Organization”.

**Table 3.** Category: Company Organization (Main conclusions drawn on the theme of organization company in the articles reviewed).

Author/Year	Main Contribution
Grant, 2002 [176]	Monetary incentives for reporting fraud are seen to be positive by employees.
Uzun et al., 2004 [87]	Characteristics of the board of directors and corporate governance correlate with the occurrence of fraud.
Sharma, 2004 [149]	Importance of the percentage of independent directors on the board. Increasing the percentage of institutional property in a company decreases the probability of fraud.
Farber, 2005 [84]	Changes in the credibility of the financial information system and the quality of corporate governance mechanisms subsequent to the detection of fraud and the economic consequences for the company of such changes.
Miller, 2006 [173]	Study on the role of the press as a monitor or “watchdog” of accounting fraud, analyzing and providing information to readers at a very low cost.
Erickson et al., 2006 [164]	There is no relationship between the capital incentives of executives and accounting fraud.
Persons, 2006 [57]	Analysis of the impact of the revelation of fraud/judicial actions in the executive rotation and its compensation.
Marciukaiyte et al., 2006 [177]	The companies increased the proportion of external directors on their board after the accusation of fraud.
Zahra et al., 2007 [144]	Analysis of different types of fraud committed by senior management and their effects on shareholders, employees, communities, companies and society in general. Importance of ethical leadership.
Povel et al., 2007 [89]	Fraud is more likely to occur in good times as the costs of surveillance diminish.

Table 3. Cont.

Author/Year	Main Contribution
Sen, 2007 [88]	When looking to reduce fraud the certainty of the determination and the application of the penalty are more important than the size of fraud itself.
Fich, 2007 [166]	External directors do not face an abnormal rotation in the board of the company sued for fraud; they do experience a significant decrease in the boards of other companies.
Kang, 2008 [178]	The director's connections with other companies act as channels that affect his/her reputation post-fraud.
Zhang et al., 2008 [179]	The effects of stock-based incentives on CEO earnings manipulation behaviors are examined
Johnson et al., 2009 [53]	Corporate fraud is an undesired result and is associated with managerial incentives.
Kaplan et al., 2009 [180]	There is more intention to report a fraudulent act with an internally administered telephone line.
Ugrin and Odom, 2010 [167]	Study on how the increase in jail time for committing fraud imposed by SOX does not offer any additional deterrence beyond the possibility of going to jail than that in the pre-SOX law.
Wang et al., 2010 [64]	The propensity to fraud increases with the level of investor beliefs about industry prospects, but decreases when beliefs are extremely high.
Dyck et al., 2010 [34]	Fraud detection is not based on standard corporate governance actors (investors, SEC, auditors), but rather on employees, the media and industry regulators.
Troy et al., 2011 [38]	Younger CEOs, with less experience and less academic training, are more likely to commit accounting fraud.
Kaplan et al., 2011 [39]	Employees are often aware of fraud before other professionals (internal and external auditors) and are more willing to report fraud to an internal auditor than to an external auditor.
Robinson et al., 2012 [181]	Employees are less likely to report: (1) financial statement fraud than theft; (2) when the violator is aware that the potential claimant knows about the fraud; and (3) when other employees are not aware of the fraud.
Alam and Petruska, 2012 [182]	The relationship between accounting conservatism and the presentation of fraudulent financial information in companies is studied.
Dimmock and Gerken, 2012 [183]	Study on the use of mandatory information that companies provide to the SEC in order to predict fraud.
Young and Peng, 2013 [17]	Investors may be able to exploit information from actions taken by analysts to uncover fraud and to protect their interests.
Lee and Fargher, 2013 [62]	The implementation of a direct line of services in a company is positively affected by economic factors, ethical environment and legal aspects.
Xiaoyun, 2013 [59]	Professional connectivity decreases financial fraud, while non-professional connectivity increases it.
Zona et al., 2013 [156]	Jointly analyze the personality traits of the CEO (e.g., lack of moral values, narcissism), the unbalanced strategies of the company and the support of shareholders for the CEOs who adopt unbalanced strategies, to explain their fraudulent behavior.
Davis and Pesch, 2013 [44]	They develop a model based on agents (employees) and how they interact with each other and with organizational variables to prevent and detect fraud.
Soltani, 2014 [51]	There are significant similarities in the following ethical aspects between the US and Europe: the tone of the upper part of the company; economic bubble and market pressure; fraudulent financial information; accountability; control; audit and governance; the compensation of managers.

Table 3. Cont.

Author/Year	Main Contribution
Johnson et al., 2014 [184]	Existence of a causal relationship between financial misconduct and the decline in the operating performance of a company that has committed fraud. Clients impose reputational sanctions through an increase in sales costs (purchase and investment).
Marcel and Cowen, 2014 [169]	After the detection of financial fraud, the boards of directors experience high levels of turnover among external directors.
Kummer et al., 2015 [185]	They indicate three very effective measures to detect fraud in non-for-profit firms: (1) fraud control policies, (2) complaint policies and 3) fraud risk registries.
Clinton and Murphy, 2015 [60]	Reasons why people co-commit fraud because of its social nature.
Khanna et al., 2015 [58]	The connections that CEOs develop with senior executives / directors through their nominations can increase the likelihood of committing fraud and decrease the likelihood of detecting it.
Fung et al., 2015 [165]	Study on the proposal to change executive compensation based on incentives by reintegration clauses.
Ndofor et al., 2015 [163]	Having the opportunity, provided by the asymmetry of information, is what the CEO's need to present fraudulent financial information.
Cumming et al., 2015 [154]	(1) Gender diversity works as a moderator for the frequency of fraud. (2) The stock market's response to fraud is much less pronounced if the board is more diverse. (3) Women are more effective, in industries dominated by men, in reducing the frequency and severity of fraud.
Haß et al., 2015 [16]	The results show a positive association between CEO incentives and the propensity to engage in fraudulent behavior.
Albrecht et al., 2015 [48]	Using the French and Raven Power Taxonomy, a model is proposed that explains how top management influences other individuals to participate in the fraud of the financial statements.
Clor-Proell et al., 2015 [186]	Study on employee fraud (theft or unauthorized use of company assets) and how the difficulty of organizational goals can have an impact on the ability to rationalize it.
Lowe et al., 2015 [187]	Members of the lower level organization are often the first people who are aware of the fraud and are in a better position to provide information.
Brazel et al., 2015 [65]	Investors examine the relationships between perceptions of the frequency of fraud in financial information, the use they make of it, the performance of their own fraud risk assessments and the use of red flags.
Hess and Cottrell, 2016 [188]	The four main sources of fraud risk in small businesses (customers, vendors, employees, Internet) are described
Goldberg et al., 2016 [157]	The property of the company affects fraud. If it is dispersed it favors the manipulation of profits and if it is concentrated it encourages the appropriation of profits by corporate governance.
Halbouni et al., 2016 [52]	The "tone at the top" is very important for improving the integrity and ethics of the company. IT must be used for fraud investigation and detection.
Salleh and Othman, 2016 [11]	Good corporate governance discourages fraud. The frequency of meetings is the best mechanism to reduce it.
Horvat and Lipicnik, 2016 [102]	Importance of the internal audit and the establishment of internal controls to avoid fraud in the financial statements.
Aghghaleh et al., 2016 [20]a	The skills of the financial models (Benech's M-score and Dechow's F-score) are investigated to detect and predict fraud in financial statements, with the latter being more effective in forecasting it.

Table 3. Cont.

Author/Year	Main Contribution
Finnerty et al., 2016 [147]	Firms are more likely to engage in securities fraud (including accounting fraud) when they have experienced a sustained period of surprisingly good performance on the stock price of up to five years before the commission of fraud.
Margret and Hoque, 2016 [189]	It is concluded that the static vision that underlies conventional financial statements is sometimes problematic. A continuous debate about the quality of an organization's published finances is necessary.
Conyon and He, 2016 [190]	There is a significantly negative correlation between CEO compensation and corporate fraud. The CEO is penalized for fraud by reducing his salary. The compensation is lower in companies that commit more severe fraud.
Kern and Weber, 2016 [191]	A program for the detection of fraud developed by the University of Gonzaga is developed together with the ACFE, the police, and local and federal prosecutors.
Wu et al., 2016 [175]	Analysis of institutional investing factors and political connections of Chinese companies, as elements that can mitigate corporate fraud risk.
Andergassen, 2016 [192]	A model is proposed to study the behavior of the manager and the shareholders in a situation in which the manager has private information about the profits of the company and the shareholders use share packages to align the interests of the manager with theirs.
Baum et al., 2016 [193]	Relationship between the results of the collective action lawsuits for securities fraud and the rotation of the members of the board of directors. This rotation is greater when there is a demand (settled) than when the demand is not brought to an end (dismissed).
Hass et al., 2016 [83]	They analyze the positive influence of shares as an incentive to managers in corporate fraud in Chinese companies.
Capezio and Mavisakalyan, 2016 [155]	Study on how the increase in the presence of women on the board of directors helps to mitigate fraud.
Johansson and Carey, 2016 [171]	Study on the how channels of anonymous notification are effective in detecting fraud, especially the appropriation of assets. Small businesses benefit more from this type of channel.
Melé et al. 2017 [63]	Ethics should be integrated into finance and accounting, since as intentional activities they can be used to do good or for selfish interests. (?)
Beneish et al., 2017 [56]b	The relationship between the dismissal of CEOs who have committed fraud and the management of the company is studied. The dismissal is greater when the cost of replacing the CEO is low and when they do not both benefit from the sale of shares during the period of fraud.
Agrawal and Cooper, 2017 [55]	The consequences of accounting fraud for top management, executive and financial directors and external auditors are examined. For the latter, the rotation is less.
Yang et al., 2017 [150]	The relationship between the independence of the board of directors of a company and the disclosure of internal weaknesses is examined (high accounting risk, few resources for internal control, complexity in financial reports). The relationship between both variables is negative and greater when the CEO and the chairman are the same person.
Tan et al., 2017 [153]	In companies with a culture of fraud, corporate governance actions can improve the welfare of shareholders. In companies that do not have a culture of fraud this is a costly effort that reduces their efficiency.
Gao and Brink, 2017 [24]	Review of the literature on the reporting of irregularities.
Wilde, 2017 [170]	After the reporting of irregularities, companies improve the preparation of financial reports and decrease their fiscal aggressiveness.
D'Onza and Rigolini, 2017 [194]	The rotation that occurs in non-executive directors in Italian companies after the detection of fraud is studied. There is a negative relationship between the departure of the company by the manager and his experience.

Table 3. Cont.

Author/Year	Main Contribution
Zhang et al., 2018 [195]	Bonus issues by fraudulent companies have a low credit rating and fraudulent companies are more likely to commit fraud again.
Sunghee and K. M. Park, 2018 [196]	The increase in the number of external directors and personnel in the internal control system of the accounting department, are the activities related to recovering the company reputation that are carried out most by companies that have committed accounting fraud.
Bhuiyan and Roudaki, 2018 [197]	The importance of the presence of independent directors as good practice of corporate governance of the company and of the external auditors in the review of related parties transactions.
Lee and Xiao, 2018 [77]	Review of the concept of reporting irregularities, analyzing the characteristics of the complainant, the characteristics of the company, the type of complaints channel provided and the consequences for the company and the complainant.

Source: authors' own elaboration.

#### 4.2.4. Psychological Aspects

Fraudulent behavior also depends on the psychological factors of those who commit it [66]. The study of the managers' psychological factors of the companies and their relationship with the fraudulent behavior is a current trend that has gained more strength. Dacin and Murphy [198] identify three ways to become involved in fraud, namely: lack of awareness, rationalization and reasoning. The personality traits of the CEO, such as the lack of moral values and narcissism, are important aspects related to the commission of fraud [156]. Specifically, the narcissism of managers seems to be a potentially important risk factor for fraud [60,144,145], and thus auditors should be aware of narcissistic behavior when making their evaluations. In other research, the psychological characteristics of the CEO are combined with traditional tools in the investigation of accounting fraud, such as the Fraud Triangle (e.g., [199]).

Table 4 offers a summary of the main contributions found in the articles reviewed with the topic "Psychological Aspects".

**Table 4.** Category: Psychological Aspects (Main conclusions drawn on the subject of the psychological aspects of fraudsters in the articles reviewed).

Author/Year	Main Contribution
Ramamoorti, 2007 [66]	The psychological factors that could influence the behavior of fraud perpetrators should also be studied.
Dacin and Murphy, 2011 [198]	Three psychological pathways to fraud are identified: (1) lack of awareness, (2) intuition along with rationalization of fraudulent behavior, and (3) reasoning (cost/benefit analysis of committing fraud).
Johnson et al., 2013 [68]	Auditors are advised to study the behavior of the CEO (narcissism), since there is a positive relationship between this variable and the motivation behind fraud.
Rijssenbilt and Commandeur, 2013 [69]	There is a positive relationship between CEO narcissism and fraud. They propose a measure of 15 variables to study this behavior.
Domino et al. 2015 [90]	Based on the Cognitive Social Theory of Bandura (1986), three significant antecedents related to the adjustment of the ethical climate in the company are analyzed: levels of focus of internal control; changes of work beforehand; ethical climate.
Murphy and Free, 2016 [199]	Association between the instrumental organizational climate (employees make decisions for themselves or to benefit the organization, regardless of ethical concerns), Fraud Triangle and fraud in the company. Fraud has an important social dimension.
Kuempel et al., 2016 [200]	The psychological and sociological aspects are integrated into the tools to be used in a financial statement audit, developing specific red flags for the perpetrators.

Source: The authors' own elaboration.

#### 4.2.5. Information Technology

This section comprises research that analyzes the use of information technology to detect accounting fraud. Since 2012, a significant increase in the use of these technologies has been observed, as, when investigating large amounts of data, they can be used proactively to identify patterns that suggest fraudulent activity in companies [201]. Another of the methodologies used is the analysis of texts, exploring the language used in the discussion and analysis of annual and quarterly reports in the company. In this case, words and terms are searched that may indicate deception, litigation, uncertainty or negative feelings [202]. In the article by Dbouk and Zaarour, supervised machine learning is proposed for detecting the manipulation of profits [203]. On the other hand, Amani and Fadlalla and West and Bhattacharya review the applications of data mining for accounting. Amani and Fadlalla reveal that the detection of fraud is one of the areas of accounting that has most benefited from this technique, while the latter focus on techniques based on computational intelligence [18,66].

Table 5 offers a summary of the main contributions found in the articles reviewed with the topic “Information technology”.

**Table 5.** Category: Information Technology (Main conclusions drawn on the use of information technologies in the detection / prevention of fraud in the articles reviewed).

Author/Year	Main Contribution
Huerta et al. 2012 [204]	There is an influence between report production (manually or automatically) by a decision-making support system (DAS) and the cultural background of the person making the decision to investigate the fraud.
Dilla and Raschke, 2015 [201]	A theoretical framework is developed to predict when and how researchers can use data visualization techniques to detect fraudulent transactions.
Purda and Skillicorn, 2015 [202]	Adding a statistical method is proposed for analyzing the language used in the discussion and analysis of annual and quarterly reports of the company to detect fraud.
West and Bhattacharya, 2016 [33]	An exhaustive review of the investigation of financial fraud detection is carried out using data mining methods, focusing on techniques based on computational intelligence (CI).
Kim et al., 2016 [205]	Multi-class study using logistic regression, support vector machines and Bayesian networks, to detect and classify erroneous financial statements with the intention of fraud.
Dbouk and Zaarour, 2017 [203]	The Beneish model is compared with the manual method of the auditors to detect the manipulation of earnings, applying a supervised machine learning approach.
Amani and Fadlalla, 2017 [26]	Review of the literature on the application of the data mining technique in accounting. Fraud detection, financial health of the company and forensic accounting are the areas that have benefited most from this technique.
Chen et al., 2017 [206]	An experiment is performed using natural language processing, a Queen genetic algorithm and support vector machine, to detect fraud in the company’s annual reports.
Dutta et al., 2018 [75]	Predictive models are proposed to detect fraudulent intentional activities as unintentional (financial reformulations), using data mining techniques.
Dong et al., 2018 [207]	Detection of signs of fraud through the analysis of text data from social networks of financial platforms (theory of systemic functional linguistics (SFL)).
Gepp et al., 2018 [27]	An underutilization of Big Data techniques in auditing is detected. The combination of these with auditing techniques and expert judgments would help early detection of accounting fraud.

Source: authors’ own elaboration.

## 5. Conclusions and Future Research

This article contributes to the literature on accounting fraud through a review and analysis of 156 articles published in high-impact journals during the period 2000–2018. Thus, the importance of accounting fraud in the current socioeconomic context, the research methodology used in its analysis, the different approaches to it, and the main conclusions of the articles have been analyzed.

To carry out the analysis of the topic of accounting fraud, the articles have been divided into five large groups: Auditors, Fraud Triangle, Company Organization, Psychological Aspects and Information Technology.

After examining the articles, we cannot conclude that any of the categories have lost their strength or importance over the 18 years reviewed. This conclusion is drawn after studying the years in which the articles and the specific topics have been published. On the other hand, it was observed that there are two aspects that seem to be gaining more followers in the last six years. These are: (1) those related to the use of information technology to help auditors better identify the patterns of fraudulent behavior in the company; and (2) the importance that is being given to the psychological aspects of fraud.

The present study leaves the door open for many lines of future research, aimed at a better understanding of the phenomenon of accounting fraud.

As far as the organizational aspects of the company are concerned, which is the topic on which the largest group of articles was found (72 articles), it would be necessary to study three aspects in depth. The first aspect would be to expand the investigation of collective fraud (collusion), since only three of the articles reviewed dealt with this specifically and, according to the ACFE (2018), fraud losses increase significantly when more than one fraudster is involved. Second, it is necessary to delve into the reasons that would induce employees to reveal fraud or to report irregularities (14 articles). Further study of the influence of monetary rewards for whistleblowers is a debate that continues to be open, as well as the confidence and protection that should be provided to the complainants, both in the design of the collection process and the analysis of the same. Thirdly, future research can address the relationship between a company's auditing committee and the management of the company (26 articles), especially the importance of the role of the chairman of the auditing committee both from the perspective of his relationship with the auditing committee and with the company's management [76]. The issue of developing ethical codes to guide the responsible behavior of the organization is another of the proposed future lines of research ([63,90]).

For the "auditors" category, which is second in the number of articles analyzed (51 articles), future research can study the effect of Artificial Intelligence and its various technologies (data mining, text analysis, etc.) on their daily work [26]. We also propose expanding the study of the auditor's responsibility in the evaluation of the financial statements, since this influences the same [104].

The category of the Fraud Triangle is the third in importance, since it includes 15 articles. Expanding the study of the triangle to include areas such as criminology, ethics, morals and values would provide a broader view of accounting fraud ([48,116]).

Finally, the information technology (11 articles) and psychological categories (7 articles) are the least numerous. However, future investigations may be aimed firstly towards the detection and classification of erroneous financial statements with the intention of fraud using Big Data techniques, which have until now been underutilized in this field [27]. Regarding the psychological aspects, it would be worth expanding the studies on the influence of narcissism in the involvement of accounting fraud, adding other aspects such as psychopathy or Machiavellianism to create profiles of fraudsters that help the identification of these individuals in companies [200].

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