ACCOUNTING FRAUD: A LITERATURE REVIEW

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Abstract

This paper explains the main features of accounting fraud across an examination of the current literature by putting the environment and the different ways to prevent fraud under a microscope. The study analyses in five steps how corporate governance, ethical behaviour, accounting manipulation, detection techniques and forensic accounting are related to fraud.
After having reviewed the most relevant literature on the topic, it emerged that in order to avoid fraudulent behaviour in a company, it is important, mostly, to establish an ethical education between employees and executives. Therefore, this article examines how governance elements such as board, CEO, or remuneration, influence the occurrence of fraud inside companies. Last but not at least, it has been seen how the role of forensic accountant has revealed itself as being very useful for his varied expertise, which have been analysed, and has been positioned as one of the top 20 future jobs.

Keywords: Accounting Fraud, Corporate Governance, CEO, Ethical Value, Corporate Social Responsibility, Creative Accounting, Fraud Prevention, Fraud Detection, Forensic Accounting

1. INTRODUCTION

In 2002 WorldCom, a telecommunications company got caught inflating assets by an amount of 11 billion $. In the same year, Tyco's CEO and CFO stole 150 million $, giving themselves loans, and inflated the company's income. In 2009, an Indian IT services and back-office accounting firm, Satyam, boosted its revenues by 1.5 billion $. Accounting fraud scandals, like these, occurred in the last twenty years, and burned billions of dollars. For this reason, the purpose of the following review is to analyse which factors lead to accounting fraud and determine its occurrence.

Accounting fraud has a wide meaning; it consists of intentional manipulation of financial statements, which are done in order to create an illusion about a company's wealth. The main actors in the process are either employees (i.e. accountants) or the organization itself, with top management team. Therefore, the reason why an accounting fraud is committed, beyond the purpose of deceiving stakeholders is often related to obtaining more favorable financing or avoiding debt obligations.

The aim of the review is to highlight what factors, during the years, facilitated the spread of fraud and, once they are identified, this could help to understand what should be done to prevent these events, in the future. Furthermore, the paper is a stepping stone for a more in-depth study that could be done on the same topic, through empirical analysis.

The study has been done on the current literature related to accounting fraud. It investigates how a company's organization could be influenced in order to prevent fraudulent behaviours. First, the governance has been analysed, focusing mostly on the role played by CEOs in the event of fraud (Troy et al., 2011; Armstrong et al., 2009; Jensen et al., 2004; Schnatterly, 2003).

Second, the focus has moved to the ethical climate which surrounds companies before the "storm" (Micewski and Troy, 2007; Soltani, 2014). Indeed, increasing education and awareness of ethics among employees and directors could be a way to avoid fraud and misconduct (Miller, 2016). Also examined is the corporate social responsibility, its consequences, and why it is so important for directors (Bowen, 1953; Carrol, 1979). Then, there has been an analysis of creative accounting (Griffiths, 1986; Jones, 2011), which differs from accounting fraud for its legit nature, and the methods of how it is committed.

The second part of the literature review is based on the detection of fraud. The main statistical methods applied to data have been examined first (Benford, 1938; Altman, 1968; Beneish, 1999), and then those methods which are not analytical, such as whistleblowing and fraud triangle. In conclusion, the role of a forensic accountant has been investigated, focusing on its expertise (Digabriele, 2009; Bhasin, 2016; Hegazy, 2017) and on its contribution inside investigations (Kolar, 2013; Quirin, 2014).

2. LITERATURE REVIEW

2.1. Corporate governance and accounting fraud

Corporate governance is a set of rules, regulations and policies that companies have to comply with in order to avoid fraud and misconduct. States themselves try to establish some controls through a regulatory system. These measures which companies decide to adopt concern, mostly, the organization and the board of directors.

Literature has recently focused on the role that CEOs and managers have in accounting fraud. Troy, Smith and Domino (2011) with their article have analysed how some CEOs could be more inclined to commit fraud than others. In particular, they identified that a specific type of managing director, sharing the same characteristics (young, less functionally experienced and without a business degree), are more likely to rationalize an accounting fraud. Moreover, CEO stock options, a tool commonly used to control managers attitude bonding company's stock prices and some benefits, do not moderate the relationship between CEO experience and the probability of accounting fraud. The results suggest that there is a direct relationship between stock options and accounting fraud.

On the other hand, research conducted by Armstrong et al. (2010) has shown how there is no evidence making a connection between CEO equity incentives and accounting irregularities. Therefore, the results are more consistent with the notion that equity incentives play a role in aligning managers' interests with those of shareholders.

At the same time, the remuneration of CEOs has its influence on the occurrence of accounting fraud and on other corporate governance problems. Indeed, equity-based pay plans, traditional pay plans and bonus plans could encourage CEOs to manage earnings in ways which destroy value and take actions to deceive investors (Jensen et al., 2004). Thus, according to Schnatterly (2003) performance-based pay for the board, along with formal cross-company communication and operational governance, reduces significantly the likelihood of criminal events.

Furthermore, directors once the accounting fraud has been revealed, face labour market penalties. Hoi and Robin (2010) have analysed how the executive and non-executive directors are sanctioned, looking to the probability of losing the internal board seat and the probability of losing an external board seat (outside directorship). As result of the investigation, they found that executive directors, once the accounting fraud is revealed, are twice as likely to lose the seat than the non-executive ones, and five times as likely to lose at least one external board seat.

The board of directors, made up of inside and outside members, could influence the occurrence of accounting fraud. According to Beasley (1996), when a larger component of outside members is present inside the board, the probability of financial statement fraud is low. Unlike the presence of outside members on the board, the role of general counsel in a firm is related to lower financial reporting quality and more aggressive accounting practices. This is likely to happen when this professional figure is highly remunerated and entails a limited aggressive behaviour that does not jeopardise their reputation in the firm (Hopkins et al., 2015).

Literature has recently recognised that organizational factors are related to a lack of fraud. In the study of Law (2011), based on hundreds of CFOs' survey responses in Hong Kong, it is highlighted how audit committee effectiveness, internal audit effectiveness, ethical policies and the tone of the top management team are associated with an absence of fraud.

So, corporate governance is a core topic inside the accounting fraud analysis, due to its influence inside a company's organization and in the policies chosen. On the other hand, a relationship exists between corporate governance and financial performance, and needs to be well considered in order to avoid fraudulent events. Corporate governance elements could be used to illustrate the path of US banks that led to the 2008 financial crisis, better than loan quality. Indeed, inside financial corporations, factors such as CEO duality, executive incentive pay, or board size had a strong influence on what happened. In fact, board size has a positive influence on financial performance, because with a larger board there is more expertise and it increases the possibility of establishing contacts with new customers. On the other hand, when the board of directors is too large, it risks damaging the board's capacity of monitoring all processes, and increases agency problems. At the same time, CEO duality is seen as a key driver of agency conflicts. Since the chairman of the board is responsible for monitoring CEO decision-making and overseeing the process of CEO hiring, compensation and firing, combining these two roles in a person would prevent the chairman from controlling CEO activity (Grove et al., 2011).

During recent years, there have been several efforts to reduce accounting fraud and corporate fraud by European countries and the rest of the world. Mostly, after financial scandals (Enron, WorldCom and Parmalat) that shed light on the many loopholes which characterise regulatory systems, states decided that it was time for a change. There have been remarkable corporate law reforms that have improved the mechanism of internal governance and disclosure requirements, and have strengthened public enforcement (Enriques and Volpin, 2007).

Sorensen and Miller (2017) in their analysis, in addition to having studied how the Enron and Parmalat scandals occurred in the US and Italy, and their regulatory systems before and after the events, have highlighted the similarities between EU and US legislation. Indeed, after the Enron financial scandal, the United States issued the Sarbanes-Oxley Act (2002) which provided most of the governance and audit changes, which nowadays we see in our companies. US and non-US companies listed in the American stock exchange have to comply with the SOX guidelines. So, a European company which had its shares listed in an American stock exchange previously had to follow the European Law and then subsequently, it has to comply with the Sarbanes-Oxley Act. Due to this long and expensive process for public companies, and after the Parmalat scandal, the EU decided to reform its Statutory Audit to improve the audit quality and to align with the SOX previsions. In particular, these changes included in Directive 2006/43/EC provide for the establishment of a chain of responsibility in the consolidated entities (audited by more than one firm) and the oversight, in listed companies, of financial reporting process by an audit committee, and other rules which concern mostly the audit company.

In conclusion, the authors believe that without a reform of the private enforcement system, accounting fraud and corporate governance misapplication will not stop.

The Italian government, in order to improve control on accounting reports inside listed companies, introduced with L. 262/2005 (Saving Law) the role of Financial Reporting Manager (also known as "Dirigente Preposto per la redazione dei documenti contabili societari"). The objective of the legislator is to establish a specific governance model, for public companies that are listed in stock markets, which concerns accounting documents and guarantees their trustworthiness.

The Financial Reporting Manager must attach a truthful statement to every document and communication regarding the economic, financial and patrimonial situation of the firm. Therefore, he is obliged to certify all the accounting documents, which come from his office, and that the financial reporting statements correspond to accounting books and data.

This new professional figure is subject to a civil responsibility and to criminal responsibility too. First, he has a civil responsibility towards whoever could be damaged by a violation of law and the company statute. Then, after the 2005 reform, the legislator has incorporated a financial reporting manager as an active person in the circumstances of accounting and corporate fraud.

The sanctionatory regime in Italy tries to emulate foreign systems, in particular, the American one. For those who commit violations, certifying the statements of periodic reports that do not comply with laws, a financial penalty of one million dollars and a ten-year custodial sentence is foreseen (Rossi, 2006). The Italian legislator, introducing the financial report manager, tried to copy the actions of the US legislator several years before with the Sarbanes-Oxley Act (2002), which expanded duties and obligations of CEO and CFO. For example, FRM has same the responsibilities that section n. 302 of SOX gave to CEO and CFO in the certification of the truthfulness of annual and quarterly reports, financial reporting and other accounting data (Pansarella, 2007).

2.2. Ethical issue and accounting fraud

Nowadays it is a widely accepted view that firms have an ethical dimension, and should follow ethical and accountability principles contained inside laws and best practices. For these reasons, multinational companies, and now small and medium-sized enterprises too use an ethics code capable of identifying the main qualities of each firm, little or big, and introduce the concept of social responsibility. To answer the need for social responsibility, in Italy the administrative responsibility D. Lgs. 231/2001 has been introduced which provides for the issue of a moral and ethics code ("Codice Etico 231"), and defines the rules on ethical behaviour. This code contains the ethical values embedded in the company, and guidelines to avoid criminal liabilities.

Corporate ethics is a strong argument which has an influence on corporate and accounting fraud. Indeed, a company that puts the focus on ethics, integrity and accountability values is, without a doubt, less subject to fraud risk, because people inside have been educated on principles contained in the code of ethics.

The study by Micewski and Troy (2007) has shown how accounting fraud, even if a quick solution to a pressing problem, has effects in the long term that makes the ethical issues on management more apparent. For example, widely used compensation schemes could be a starter for unethical behaviour. The paper discussed how an ethical reinforcement of the business world could be achieved only with the application of self-regulating measures along the lines of deontological ethics. According to the authors, these ethical principles should be introduced in the corporate system and should guide the directors during the decision-making, mostly in that situation where they would like to operate outside the law.

Even though accounting fraud could create ethical issues in the long term and be a risk for the company, there could be an opposite situation where many ethical issues put together with other components are able to create some fraudulent behaviours. This is the subject of analysis conducted by Soltani (2014) where comparisons were made between three American (Enron, WorldCom and HealthSouth) and three European (Parmalat, Royal Ahold and Vivendi Universal) corporate failures. From the comparison, several similarities emerged among the factors that led these public companies to their failures, even though these belong to two different worlds (American corporate and European corporate). Furthermore, concerning the ethical climate that affected these companies, it is important to note that the interests which moved the unethical behaviour went beyond the top management team. Indeed, if we look at how the companies operated during the years before their failures, it can be seen that a poor ethic climate prevailed and there was a lack of commitment to principles and professional ethics. From analysing these scandals it comes to light that the ethical issue has been added to inefficient governance, ineffective board, distorted incentive schemes, dominant executives and CEOs and lack of an ethical policy at the top. In conclusion, many of the problems that have been crucial to the companies' failure were linked with the hierarchical characteristics inside the organization, the strong egoism, the abuse of power and the influential position of the CEOs.

Defined as the commitment of the company to assume a right and impartial behaviour, the Corporate Social Responsibility (CSR) consists of the responsibility for the social and environmental impacts of business operations.

After World War II, mostly in the 1950s, the idea of corporate responsibility started to spread in the business world with the monography "Social Responsibilities of the Businessman" of H. Bowen (1953), which highlighted that corporate leaders are "at the service of the society" and the managers of the enterprises do not have to fulfil only the stakeholders' interests. Later, Carrol (1979) defined the corporate social responsibility as a four-step model, where beyond economic ("be profitable") and legal ("be compliant") responsibilities there are ethical responsibilities too. This last type of responsibilities, which need assessment, concern additional activities and behaviours that are supposed to follow the ethical schemes dictated by society.

Finally, the last step is represented by discretionary responsibilities ("be a good corporate citizen"). In Carrol's model just described, many qualities which a company should have can be found. First of all, be profitable. Then, it has to be in accordance with the law (compliance) and follow ethical principles contained in its code. Lastly, it has to fulfil the responsibilities that cannot be found in the law or in the ethics but represent what society wants (D'orazio, 2003).

The concept of corporate social responsibility is opposed to fraud. Even if the first one tries to sensitise the company to the various responsibilities towards those who are part of it, fraud has negative effects directly on the people that make it up.

With regard to Enron's scandal, which occurred in 2001, it can be seen how accounting fraud or earning management phenomenon are strong indicators of a serious downfall of corporate ethics. This raised a remarkable interest in the findings, such as to analyse the relationship between earning management (EM) and corporate social responsibility (CSR). Chih et al. (2008) studied three kinds of earning management, which are earning smoothing, earning aggressiveness, and earning losses and decrease avoidance. As a result, a bigger commitment to corporate social responsibility involves attenuation of the extent of earning smoothing and the reduction of the earning losses and decrease avoidance, whereas the range of earning aggressiveness is improved. Earning management, or generally accounting fraud, are often linked with little relevance given to ethical values from the top management team (CEOs and executives).

The study put its focus on the manager's behaviour and motivations in accounting fraud. The presence of a connection between economic trend and the likelihood that a manager would commit accounting fraud, inflating earnings, has been analysed. Following this analysis, it is safe to state that the poor performance of companies in periods of expected economic growth increases the incentives of managers to commit fraud. On the other hand, when the economic trend is weak and has a lower direction, it is more likely that they will try to reduce losses. In these cases managers need to inflate incomes to avoid executives having a bad consideration of them, "the incentive effect". Furthermore, a high level of economic activity reduces the number of companies that have bad performance and need to commit fraud, "the nature effect" (Fernandes & Guedes, 2010).

The CEOs narcissism is a behaviour that, according to Rijsenbilt and Commandeur (2013), has the capacity to negatively influence the decision-making process. There is a direct relationship between fraud and the likelihood that an executive could make a bold decision with a negative consequence for the company. Now, having established that, in most of the cases, the decision of committing fraud has been taken by the top management team, it is good to analyse how these events can be mitigated or contained in the future.

Education is a fundamental moment in a manager's career, where he receives basic knowledge that later will be applied and used in his job. This is a phase where literature has put its focus and has given the guilt of accounting fraud to those professors who should have increased ethical knowledge in the students' accounting curriculum. Indeed, those professors inside the most prestigious universities of the world, who have not given enough relevance during classes to ethics and corporate responsibility arguments, are the problem behind fraud and unethical behaviour. In spite of improvements in this situation, according to a comparison done on ethical education before and after 1992, the belief is maintained that it is not sufficient and over two decades has not significantly changed (Miller, 2016).

With a proper academic education, to solve the problem of fraud and misconduct, it takes a big effort for governments and international communities to regulate these malpractices. Soltani and Maupetit (2015) examined the importance of ethical and integrity values in laws, regulations and codes of corporate governance. They found several factors lacking in the European codes and regulations concerning the importance given to ethical values, the integrity of management and accountability mechanism. According to the authors, who analysed the major features of the reforms done by the European Commission and the five countries (Italy, France, Germany, Netherland and the UK) which present the most developed corporate governance codes, regulators have put the focus on financial accounting and reports, and other auditing matters, without any mention of business ethics and corporate behaviour.

Indeed, among the efforts of the EU to reduce the occurrence of fraud and financial scandals the presence of a non-executive (independent) directors inside supervisory board has been introduced, with Commission recommendation 2005/162/EC, which oversees areas where there could be any conflict of interest (i.e. remuneration and nomination of directors). Therefore, one of the most important initiatives in corporate governance rules is the introduction of the "comply or explain" principle (Directive 2006/46/EC) for listed companies. These companies could either comply with CG laws or not, with the only obligation, in case of noncompliance, to explain in the disclosure their decision. Soltani and Maupetit believe that although the "comply or explain" theory gives wide flexibility to a company, it is inefficient due to the frequent inadequate information contained in the disclosure.

In the Italian landscape, the corporate governance codes (Preda Code and Italian Corporate Law) discipline the composition of the board, with the presence of independent directors, and the accountability mechanism, that depends on which board structure is chosen and who has the power or has been delegated inside the board. Authors ended the analysis suggesting the EU improve the importance of ethics in its reforms, and possibly extend these codes of governance to unlisted companies as well.

3. CREATIVE ACCOUNTING AND ACCOUNTING FRAUD

3.1. Definition and main actors

Creative accounting is a practice known for the first time in studies by the English author Ian Griffith in 1986, and then it spreads itself around the rest of the world. Although there is not a precise definition of the term, it has different meanings depending on the countries where they are given. In the US, creative accounting is not only a legal operation aimed at adjusting accounting data, but has a wider meaning, incorporating in itself also fraud. However, in literature, it is common to find this practice under other names, such as "earning management" or "income smoothing". Instead, in European literature, it is known with the unique name of creative accounting (Amat and Gowthorpe, 2004). Differently, in the United Kingdom, creative accounting is considered only as a practice inside the regulatory system and totally legitimate.

A first definition of the term has been given by Ian Griffiths (1986) in his book "Creative Accounting". The author began claiming that: "Every company in the country is fiddling its profits. Every set of published accounts is based on books which have been gently cooked or completely roasted. The figures which are fed twice a year to the investing public have all been changed in order to protect the guilty. It is the biggest con trick since the Trojan horse. […] In fact this deception is all in perfectly good taste. It is totally legitimate. It is creative accounting".

The literature with Michael John Jones (2011) has recognised that creative accounting is based on the flexibility of the regulatory system. It tries to fix accounting data in order to favour the interests of those who prepare the financial statements for the stakeholders, who use data to make economic decisions. Therefore, flexibility is a necessary quality of the system so that companies could "cook the books". Despite the effort of regulators, it proves very hard to eliminate creative accounting due to the purpose of a financial statement, that is to give a "true and fair view", and it requires a certain degree of versatility. Furthermore, almost all the European regulatory systems have this objective.

Both creative accounting and accounting fraud are practices that require the use of deceit, and then it is common that these two terms are interchangeable. However, among them, there is a significant difference represented by the legitimate area where creative accounting operates.

The main actors in creative accounting are not only managers or executives but also merchant bankers, with the purpose of presenting accounts in a more favourable way for their interests. On the other hand, regulators and company auditors try to mitigate this practice with laws, and other best practices that guarantee a true and fair view.

The first subjects to have an interest in enhancing a company's profits are managers. They use creative accounting to fix accounting data, by increasing earnings or decreasing expenses. One of the main risks which companies run is that they start modifying some elements of the financial statement, and it ends with overcoming the limit beyond which the creative accounting becomes fraud (Jones, 2011). The motivations behind these actions are often related to the manager's remuneration, that could be linked with corporate performance, or with dividend if managers are also shareholders. Further, Shah et al. (2011) identified some of the main interests of managers, such as the achievement of internal goals and external expectations, the achievement of tax incentives and "window dressing" operations before an IPO or a loan.

3.2. Creative accounting techniques

Creative accounting is based merely on the flexibility of the regulatory system, on the timing of operations, and on the reclassification and presentation of accounting data. Combining these elements in the right way, it is possible to give an untrue view of the financial situation of the company (Amat & Gowthorpe, 2011). All the creative accounting techniques, given the double-entry method, are done "debiting or crediting an operation in an inappropriate account" (Shah et al., 2011).

Michael Jones (2011), in his monography, highlighted 5 macro-techniques of creative accounting: increase income; decrease expenses; increase assets; decrease liabilities; increase cash flow. Each of these operations could be fulfilled enhancing or decreasing the amount recorded in accounts of the macro-areas of the financial statement. Obviously, there is a limit beyond which these adjustments could be done, otherwise it becomes illegal. Some examples could be the increase of value of the goods during the closing inventory (this value reduces costs), or the enhancement of those assets which are considered intangible (i. e. brands, patents or goodwill). These are only some of the several methods and techniques with which managers can fix accounting data and increase company profits, without committing any fraud.

4. FRAUD DETECTION AND ACCOUNTING FRAUD

The following part of the literature review aims to provide an introduction to fraud detection, analysing first the statistical methods, applied with a computer and specific algorithms, and subsequently those techniques that do not use informatics systems such as whistleblowing, fraud triangle and brainstorming.

The detection of fraud and accounting data manipulation, using statistical methods, starts with data mining. It consists of extrapolating data that later will be used as assumptions to calculate financial indicators, which measure insolvency or fraud risk. Successive to the collection of data, statistical methods, such as Benford's law, Altman's z-score and Beneish's M-score, will be applied.

4.1. Benford's law

Discovered for the first time by Newcomb (1881) and then empirically confirmed by Benford (1938), Benford's law found a wide application in the business world. According to Hurlimann (2006), out of 350 scientific publications about Benford's distributions, 166 have been issued between 2000 and 2006, proving that over the past decades it has assumed a strong relevance. This statistical method is used as an "anti-doping test" inside the process of fraud detection and the analysis of accounting data. Indeed, auditors are required to use analytical procedures to identify the presence of transactions, events or unusual trends, and to make assumptions based on a first-digit distribution of data.

Benford's law provides expected schemes of the digits in numerical data and is recommended as a test for the authenticity and the trustworthiness of transaction's accounting data. Nigrini & Miller (2009), besides having described how Benford's model works, provided a second-order test that determines the digit frequencies of the differences between the ranked values in a data set. A further, second-order test has been applied to 4 groups of transactional data, and it detected errors in data downloads, rounded data, data generated by statistical procedures, and the inaccurate ordering of data.

The literature suggests that Benford's model, to be used properly, has to keep the likelihood of false positive or false negative quite low. However, Diekmann and Jann (2010) have maintained that the first-digit distribution cannot be reliable to discriminate between manipulated and non-manipulated estimates. Furthermore, the authors have concluded the article suggesting that future researchers should put the focus on the trustworthiness of the test.

4.2. Altman's z-score

Another statistical method commonly applied to accounting data, and in fraud detection, is Altman's z-score.

Altman (1968) with his scientific publication introduced the world to z-score model, which is the result of a company's solvency test measured on its probability of failure. Altman's indicator is built on five financial indicators that are obtainable from a company's financial statement:

X_1= Working Capital/Total Asset;
X_2= Retained Earnings/Total Asset;
X_3= EBIT/Total Asset;
X_4= Market Value of Equity/Total Liabilities;
X_5= Sales/Total Asset.

z-score model is then calculated by the formula:

$$Z\text{-}SCORE = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5. \quad (1)$$

Depending on results, it could be established if a company is subject, more or less, to insolvency risk and then to bankruptcy risk, or not. When z-score is above 2.99, the company is in a "safe zone"; rather, when the result is under 1.81, the company is in a "distress zone", that is considered as a dangerous area.

Finally, when z-score gives a value between 2.99 and 1.81 that is a grey zone where results are not certain and they should be vetted with more analysis.

The literature has recently focused on the reliability of Altman's indicator, and has tried to verify the extension of it to other realities, being the model created on American corporate. In the study conducted by Almamy et al. (2016), it was found that adding cash flows to the five variables of the model, there could be a proper result in the evaluation of the company's health and in the solvability risk of UK companies. Furthermore, to test the predictive power of Altman's extent model it has been applied before, during and after the 2008 crisis. The results show that "J-UK model" has more accuracy than the z-score model, in the prediction of a company's health status.

4.3. Beneish's M-score

M-score model, along with Altman's z-score and Benford's law, is a valid tool in fraud detection. This mathematical method, created by Professor D. Beneish, consists in eight variables that identify financial fraud events or the tendency of a company to manipulate accounting data. The variables are represented by actual data contained inside the balance sheet, and once put together they prove the earning management rate.

The M-score variables are: SGI (Sales Growth Index), GMI (Gross Margin Index), AQI (Assets Quality Index), DSRI (Days' Sales in Receivables Index), SGAI (Sales, General & Administrative Expenses Index), DEPI (Depreciation Index), LVGI (Leverage Index) and TATA (Total Accrual to Total Assets). Once the financial indicators are calculated, the next step is using them inside the linear regression:

$$M\text{-}SCORE = -4.84 + 0.92\,DSRI + 0.528\,GMI + 0.404\,AQI + 0.892\,SGI + 0.115\,DEPI - 0.172\,SGAI + 4.679\,TATA - 0.327\,LVGI \quad (2)$$

For values under -2.22, the company do not have manipulated accounting data; whereas, when the m-score is over -2.22 it highlights that, likely, the company could have used earning management practices. Beneish's indicator is very useful to identify who manipulated data and the areas where they operated earning management policies (Beneish, 1999).

Therefore, statistical methods such as Benford's law, Altman's z-score and Beneish's M-score revealed themselves to be useful and valid inside the process of fraud detection.

Professional figures involved in fraud detection and in its prevention, use other tools beyond the analytical ones. These could be, for example, brainstorming sessions or questionnaires conducted at each business level, otherwise whistleblowing channels that give the possibility to employees to report in an anonymously, any illegal activity inside the firm. A last tool is represented by Albrecht's fraud triangle. It makes possible the identification of those elements that, if put together, have the tendency to produce accounting or financial fraud.

4.4. Whistleblowing

The term "whistleblowing" has been coined by Ralph Nader in the 1970s during his investigative activities. The whistleblower existed, in the corporate world, long before Nader give him the name, however, more negative terms were used, for example, "snitch" or "informant".

Cambridge Dictionary defines whistleblower as "a person who tells someone in authority about something illegal that is happening, especially in a government department or a company". Furthermore, usually in most circumstances, the person who blows the whistle is an employee of the company reported.

Dyck, Morse & Zingales (2010) have analysed fraud cases in the United States that occurred between 1996 and 2004. They found whistleblower's incentives network to be poor and auditors, analysts and employees did not seem to obtain much. In particular, employees seemed to lose out with whistleblowing.

Indeed, the authors have suggested that monetary incentives given to those who decide to report crimes should be increased. For employees, many benefits could be achieved from whistleblowing, which go from up to 46.7 million $ in a "qui tam" suit to avoid legal responsibilities connected with involvement in the fraud.

As reported by several whistleblowers, due to the high costs they have suffered after having reporting crimes, they would never take the same decision again in the future if faced with that decision.

The literature has studied also what factors influence the whistleblower's silence, when the opportunity to act in the right way shows up. MacGregor and Stuebus (2014) using fraud triangle and moral behaviour models have identified factors that could induce an employee to rationalize a "fallacious silence". These are often related to personality traits, cultural and social influences and moral awareness.

Therefore, during recent years there have been experimental studies that investigated the objective of people who have reported offenses through anonymous channels or not. The results have suggested that people's intentions to report illegal activities through non-anonymous channels are lower when there have been negative repercussions for whistleblowers. Consequently, the availability of an anonymous channel, mostly when previous whistleblowers did not have a positive consequence, improves the tendency of people to use it (Kaplan et al., 2012).

4.5. Fraud triangle

The last method used to detect accounting fraud, and fraud in general, is the fraud triangle.

Fraud triangle theory has been hypothesized for the first time by Cressey (1953), and then it has been resumed by Albrecht (1984). This theory sees fraud as a combination of three elements: opportunity, pressure, and rationalization.

The first component is pressure. Even though we are not all predisposed to commit crimes, once we face a need or the right pressure (financial, environmental or personal) we could be able to perpetrate a fraud. Along with pressure, there is an opportunity, linked with personal capabilities, and rationalization too, that is the most important because it allows the fraudster to blame the system or someone else for his actions. With the use of the fraud triangle inside the process of detection, it is possible to identify those red flags that, once put together, could show fraudulent behaviours.

An extension of the fraud triangle has been analysed in literature by Wolfe and Hermanson (2004), with their fraud diamond risk model. The authors considered a fourth element - capability, in order to improve the reliability of results in the fraud detection process. According to Wolfe and Hermanson capability plays a fundamental role in the fraud, because it allows the fraudster the opportunity to commit fraud without the risk of getting caught. Among the elements that characterise most capability, we have intelligence, ego, top position inside a company, ability to lie and to manage stress.

5. FORENSIC ACCOUNTING AND ACCOUNTING FRAUD

Over the last decade, we have witnessed a strong growth in the fraud investigations world on the role of the forensic accountant. This new professional figure is born from the need to combine the roles of accounting and investigative knowledge, carry out a job, as the name suggests, that is not just about fraud and economic crime but also puts focus on the quantitative determination of the likely cases which could be subject to litigation (Pogliani, Pecchiari & Mariani, 2012).

In the literature, there have been several definitions of "forensic accounting" depending on the specific job where they were given, and most of them share the focus on the accounting aspect. However, Huber and Digabriele (2014), after a review of the numerous definitions given over the years, arrived at the conclusion that forensic accounting is more complex than each definition that is able to summarize. The reason is that the definition should collect all the areas where the forensic accountant works (i. e. administration, audit, criminology, data mining, finance, economy, law etc.) and his main capabilities.

The forensic accountant has to be a specialist in accounting and financial systems, in order to be able to work in both public and financial companies. However, due to the growth in terms of dimension and complexity of companies to uncover fraud, the forensic accountant should become an expert in all the professional expertise and emergent capabilities. Among the main expertise of the FCA (Forensic Chartered Accountants) can be found: in-depth knowledge of financial statements and the ability to critically analyse them; the detection of fraud schemes among which are asset misappropriation, money laundering and corruption; knowledge of computer and network systems, to conduct inquiries in the area of e-Banking and computerized accounting systems; complete knowledge of corporate governance policies and the laws which regulate these policies; the capacity to comprehend the internal control systems of companies and setting up a control system that assesses risks, achieves management goals and informs employees of their responsibilities on the control (Bhasin, 2016).

The role of the forensic accountant is conducted by a person that in broad terms has the same capabilities as an auditor. For this reason, sometimes the two figures can overlap. Thus, Digabriele (2009) starts wondering if the forensic accountant's abilities should be added to the auditor's, in order to increase the likelihood of detecting accounting fraud. The analysis conducted in the USA on a random sample of accounting academics highlighted that Forensic Accounting (FA) has a role in the audit process and the auditors themselves may need to add new knowledge to theirs, given the continuous market change. To answer the question Digabriele posed first, it could be confirmed that after the issue of his article, the auditor's awareness of acquiring the fundamental skills and expertise of the forensic accountant is certainly enhanced.

In literature, it is widely discussed which knowledge the forensic accountant should have, and the several authors who tried to give an answer to the argument are influenced by the country where the research is conducted. The strict connection between the country and the skills required for the job find explanations in the type of offence committed. Taking as an example Italy, according to PWC "2018 Global Economy Crime Survey", 45% of companies which took part in the survey admitted to being victims of cyber-crimes. Indeed, as reported by Bhasin (2016), the forensic accountant must know computers and network systems. Cyber-crimes, in Italy, are followed by asset misappropriation (42%), consumer fraud (32%) and accounting fraud (24%).

Instead, in the United Kingdom, forensic accounting is a multidisciplinary area, less focused on accounting as the name suggests, and dominated by auditors. The main skills that qualify the forensic accountant are not his knowledge in accounting subjects, but his many analytic and communicative capabilities (Hegazy, 2017). In the Nigerian sector, on the other hand, due to the strong development of fraudulent phenomenon, the presence of forensic accountants inside anti-corruption agencies produces significant effects on fraud detections (Gbebi & Adebisi, 2014). The study puts its focus on the methods and arguments of research, too. In the specific case of detecting financial statement frauds, the main strategy to find the fraudulent behaviour is based on the reasoning behind a deceiver's goal (Johnson, 1993). On the other hand, sometimes the absence of differentiation between the methods used by forensic accountants has the potential to compromise the overall contribution of forensic accountant work (Digabriele & Huber, 2015).

Forensic accounting is not only applied inside firms, as someone could easily think, but there are many other areas where it is used, for example in legal inquiries. Furthermore, it is during such trials that this professional figure could prove itself very useful, supporting the work of the magistrate or the district attorneys and analysing in-depth financial schemes, financial statements and accounting data, which do not comply with legal expertise. The forensic accountant deals with investigations in corporate crimes in several countries, for example in the US and UK. Nowadays, during court trials, an outside advisory of an accounting expert is often required, even though the results of the consultation cannot be verified. For this reason, it is not uncommon to witness an enhanced length of the investigation process and other judicial processes. Results of the research conducted by Kolar (2013) on a sample of investigators and state prosecutors maintain that they do not have enough knowledge to carry out an efficient investigation of accounting documents. Moreover, the interviewees themselves were aware of the figure of the forensic accountant and believed that his expertise could benefit the investigations on accounting fraud. In the same way, Quirin (2014), analysing a case where he worked as a forensic accountant, shows how this role could be useful to support and to add value in many areas of litigation, thereby confirming the facts here presented.

In conclusion, forensic accounting is a subject of central relevance, along with fraud audit, in the detection and investigation of accounting and corporate fraud. Its strength is represented by the fact that it is a mix of knowledge that earlier was owned only by different professional figures, and now is ranked as one of the top 20 future jobs.

6. CONCLUSION

The literature review analysed the relationship between accounting fraud and main factors which are responsible for its occurrence.

The results indicate that accounting fraud is often due to the unethical behaviour of a person, or a group of people, who did not receive sufficient ethic education. However, according to the fraud triangle theory of Albrecht, capacities and rationalization are just the principal skills of a deceiver. Further, directors and executives are moved also by the desire of achieving a higher position in an organization, of reaching an amount of income that gives them bonus pays, or by the "building empire", that is the will to create a powerful position in the market.

Corporate governance revealed itself to be a core variable in accounting fraud, where most of the time key personnel in the firm is related to fraud. The results confirm that CEOs, over the years, have been at the centre of scandals for their scams. Then, it emerged that audit committees and regulators, through law and best practices, should increase controls on CEOs.

Concerning practical implications, our analysis results might support the choice of public enforcement and prosecutors to use a forensic accountant during the investigations. Indeed, a forensic accountant could be a relevant figure during the years ahead due to the variety of skills they have and for the importance of the area where they work.

REFERENCES

1. Albrecht, W. S., Howe, K. R., & Romney, M. B. (1984). *Deterring fraud: the internal auditor's perspective*. Florida: Institute of Internal Auditors Research Foundation.
2. Almamy, J., Aston, J., & Ngwa, L. N. (2016). An evaluation of Altman's z-score using cash flow ratio to predict corporate failure amid the recent financial crisis: Evidence from UK. *Journal of Corporate Finance, 36(c),* 278-285. https://doi.org/10.1016/j.jcorpfin.2015.12.009
3. Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance, 23(4),* 589-609. https://doi.org/10.1111/j.1540-6261.1968.tb00843.x
4. Amat, O., & Gowthorpe, C. (2004). *Creative accounting: Nature, incidence and ethical issues* (UPF Working Paper No. 749). Retrieved from: https://ssrn.com/abstract=563364.

5. Armstrong, C. S., Jagolinzer, A. D., & Larcker, D. F. (2010). Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research*, *48(2),* 225-271. https://doi.org/10.1111/j.1475-679X.2009.00361.x
6. Beasley, M. S. (1996). An empirical analysis of the relation between the board of director composition and financial statement fraud. *Accounting Review*, *71(4),* 443-465.
7. Beneish, M. D. (1999). The detection of earnings manipulation. *Financial Analysts Journal*, *55(5),* 24-36. https://doi.org/10.2469/faj.v55.n5.2296
8. Benford, F. (1938). The Law of anomalous numbers. *Proceedings of the American Philosophical Society*, *78*, 551-572.
9. Bhasin, M. L. (2016). Contribution of forensic accounting to corporate governance: An exploratory study of an Asian country. *International Business Management*, *10(4),* 479-492.
10. Bowen, H. (1953). *Social responsibilities of the businessman.* New York: Harper.
11. Cambridge Dictionary. "*Whistleblower" definition.* Retrieved from: https://dictionary.cambridge.org/it/dizionario/inglese/whistle-blower
12. Carroll, A. B. (1979). A three-dimensional conceptual model of corporate performance. *Academy of Management Review*, *4*, 497-505. https://doi.org/10.2307/257850
13. Chih, H. L., Shen, C. H., & Kang, E. C. (2008). Corporate social responsibility, investor protection, and earning management: Some international evidence. *Journal of Business Ethics*, *79(1-2),* 178-198. https://doi.org/10.1007/s10551-007-9383-7
14. Cressey, D. R. (1953). *Other people's money: A study in the social psychology of embezzlement.* Glencoe, IL: Free Press.
15. D'orazio, E. (2003). Responsabilità sociale ed etica d'impresa. *Politeia, XIX, 72,* 3-27.
16. Diekmann, A., & Jann, B. (2010). Benford's law and fraud detection: Facts and legends. *German Economic Review*, *11(3),* 297-401. https://doi.org/10.1111/j.1468-0475.2010.00510.x
17. Digabriele, J. A., & Huber, W. (2015). Topics and methods in forensic accounting research. *Accounting Research Journal*, *28(1),* 98-114. https://doi.org/10.1108/ARJ-08-2014-0071
18. Digabriele, J. A. (2009). Implicational of regulatory prescriptions and audit standards on the evolution of forensic accounting in the audit process. *Journal of Applied Accounting Research*, *10(2),* 109-121. https://doi.org/10.1108/09675420910984673
19. Dyck, A., Morse, A., & Zingales, L. (2010). Who blows the whistle on corporate fraud? *The Journal of Finance*, *65(6),* 2213-2253. https://doi.org/10.1111/j.1540-6261.2010.01614.x
20. Enriques, L., & Volpin, P. (2007). Corporate governance reforms in continental Europe. *Journal of Economic Perspectives*, *21(1),* 117-140. https://doi.org/10.1257/jep.21.1.117
21. Fernandes, N., & Guedes, J. (2010). Keeping up with the Joneses: A model and a test of collective accounting fraud. *European Financial Management*, *16(1),* 72-93. https://doi.org/10.1111/j.1468-036X.2009.00494.x
22. Gbegi, D. O., & Adebisi, J. F. (2014). Forensic accounting skills and techniques in fraud investigations in the Nigerian public sector. *Mediterranean Journal of Social Sciences*, *5(3),* 243-252. https://doi.org/10.5901/mjss.2014.v5n3p243
23. Griffiths, I. (1986). *Creative accounting.* London: Sidgwick and Jackson.
24. Grove, H., Patelli, L., Victoravich, L. M., & Xu, P. T. (2011). Corporate governance and performance in the wake of the financial crisis: Evidence from US commercial banks. *Corporate governance*, *19(5),* 418-436. https://doi.org/10.1111/j.1467-8683.2011.00882.x
25. Hegazy, S., Sangster, A., & Kotb, A. (2017). Mapping forensic accounting in UK. *Journal of International Accounting, Auditing and Taxation*, *28*, 43-56. https://doi.org/10.1016/j.intaccaudtax.2016.12.004
26. Hoi, C. K., & Robin, A. (2010). Labour market consequences of accounting fraud. *Corporate Governance*, *10(3),* 321-333. https://doi.org/10.1108/14720701011051947
27. Hopkins, J. J., Maydew, E. L., & Venkatachalam, M. (2015). Corporate general counsel and financial reporting quality. *Management Science*, *61(1),* 129-145. https://doi.org/10.1287/mnsc.2014.2072
28. Huber, W. D., & DiGabriele, J. A. (2014). Research in forensic accounting-what matters? *Journal of Theoretical Accounting Research, 10(1),* 40-70.
29. Hurlimann, W. (2006). *Benford's law from 1881 to 2006: A bibliography.* Retrived from: arXiv:math/0607168v1
30. Jensen, M. C., Murphy, K. J, & Wruck, E. G. (2004). *Remuneration: Where we've been, how we got to here, and how to fix them* (Harvard NOM Working Paper No. 04-28; ECGI - Finance Working Paper No. 44/2004). Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=561305
31. Johnson, P. E., & Grazioli, S. (1993). Fraud detection: Intentionality and deception in cognition. *Accounting, Organizations and Society*, *18(5),* 467-488. https://doi.org/10.1016/0361-3682(93)90042-5
32. Jones, M. J. (2011). *Creative accounting, fraud and international accounting scandals.* Hoboken: Wiley.
33. Kaplan, S. E., Pany, K., Samuels, J., & Zhang, J. (2012). An examination of anonymous and non-anonymous fraud reporting channels. *Advances in Accounting*, *28(1),* 88-95. https://doi.org/10.1016/j.adiac.2012.02.008
34. Kolar, I., & Zdolsek, D. (2013). Perceptions of forensic accounting related to the investigations of corporate criminal offence. *Journal of Criminal Investigation*, *64(2),* 182-194.
35. Law, P. (2011). Corporate governance and no fraud occurrence in organizations: Hong Kong evidence. *Journal of Business and Industrial Marketing*, *26(6),* 501-518. https://doi.org/10.1108/02686901111142558
36. Macgregor, J., & Stuebs, M. (2014). The silent Samaritan syndrome: Why the whistle remains unblown. *Journal of Business Ethics*, *120(2),* 149-164. https://doi.org/10.1007/s10551-013-1639-9
37. Micewski, E. R., & Troy, C. (2007). Business ethics - deontologically revisited. *Journal of Business Ethics*, *72(1),* 17-25. https://doi.org/10.1007/s10551-006-9152-z
38. Miller, W. F., & Shawver, T. J. (2016). An exploration of the state of ethics in the UK accounting education. *Journal of Business Ethics*, 1-12.
39. Newcomb, S. (1881). Note on the frequency of use of the different digits in natural numbers. *American Journal of Mathematics*, *4(1),* 39-40. https://doi.org/10.2307/2369148
40. Nigrini, M. J., & Miller, S. J. (2009). Data diagnostics using second-order tests of Benford's law. *Auditing*, *28(2),* 305-324. https://doi.org/10.2308/aud.2009.28.2.305

41. Pansarella, M. (2007). La legge 262/2005 ed il d.lgs. 231/2001: Punti di contatto ed esigenze di coordinamento. *La responsabilità amministrativa delle società e degli enti*, *1(3),* 177-187.
42. Pogliani, G., Pecchiari, N., & Mariani, M. (2012). *Frodi aziendali: Forensic accounting, fraud audit e litigation*. Milano: Egea.
43. PricewaterhouseCoopers. (2018). *Global Economic Crime and Fraud Survey 2018 summary Italy*. Retrieved from: https://www.pwc.com/it/it/publications/docs/pwc-global-economic-crime-fraud-furvey-2018.pdf
44. Quirin, J. J., & O'Bryan, D. W. (2014). The mobile home monster: A forensic case in the use of public records to locate assets. *Issues in Accounting Education*, *29(2),* 371-378. https://doi.org/10.2308/iace-50616
45. Rijsenbilt, A., & Commandeur, H. (2013). Narcissus enters the courtroom: CEO narcissism and fraud. *Journal of Business Ethics*, *117(2),* 413-429. https://doi.org/10.1007/s10551-012-1528-7
46. Rossi, A. (2006). La responsabilità del dirigente preposto alla redazione dei documenti contabili e il sistema sanzionatorio. *La responsabilità amministrativa delle società e degli enti*, *1(4),* 7-26.
47. Schnatterly, K. (2003). Increasing firm value through detection and prevention of white-collar crime. *Strategic Management Journal*, *24(7),* 587-614. https://doi.org/10.1002/smj.330
48. Shah Ali, S. Z., Butt, S. A., & Bin Tariq, Y. (2011). Use or abuse of creative accounting techniques. *International Journal of Trade, Economics and Finance*, *2(6),* 531-536.
49. Soltani, B. (2014). The anatomy of corporate fraud: A comparative analysis of high profile American and European corporate scandals. *Journal of Business Ethics*, *120(2),* 251-274. https://doi.org/10.1007/s10551-013-1660-z
50. Soltani, B., & Maupetit, C. (2015). Importance of core values of ethics, integrity and accountability in the European corporate governance codes. *Journal of Management and Governance*, *19(2),* 259-284. https://doi.org/10.1007/s10997-013-9259-4
51. Sorensen, D. P., & Miller, S. E. (2017). Financial accounting scandals and the reform of corporate governance in the United States and in Italy. *Corporate Governance*, *17(1),* 77-88. https://doi.org/10.1108/CG-05-2016-0125
52. Troy, C., Smith, K. G., & Domino, M. A. (2011). CEO demographics and accounting fraud: Who is more likely to rationalize illegal acts? *Strategic Organization*, *9(4),* 259-282. https://doi.org/10.1177/1476127011421534
53. Wolfe, D. T., & Hermanson, D. (2004). The fraud diamond: Considering the four elements of fraud. *The CPA Journal*, 38-42. Retrieved from: https://digitalcommons.kennesaw.edu/cgi/viewcontent.cgi?article=2546&context=facpubs

APPENDIX

Table 1. Cases discussed in the literature review

Author	*Year*	*Objective of the paper*	*Period of observation*	*Sample*	*Statistical Results*	*Conclusion*
Almamy, Aston & Ngwa	2016	It investigates the extension of Altman z-score in predicting the health of UK companies.	2000-2013	1000 UK companies	X3 variable (EBIT/TA) is less significant in UK companies; once the additional variable (cash flow) is included, it makes Altman's ratios more significant at 10% confidence level.	J-UK model has a higher accuracy than Altman's z-score model in predicting the health of UK companies.
Altman	1968	It attempts an assessment of quality ratio analysis and tries to predict bankruptcy.	1946-1965	33 corporations that filed a bankruptcy petition and 33 corporations that were still in existence in 1966 (non-bankruptcy corp.)	Applying z-score model to the two groups of bankrupt and non-bankrupt companies, it emerged that 96% of the firms that filed a bankruptcy petition was considered at high risk.	Z-score is a reliable tool to predict bankruptcy. In particular, when z-score is under 1.81, these firms are clearly in bankruptcy. On the other hand, when the value is above 2.99 there is no risk of bankruptcy.
Amat & Gowthorpe	2004	It analyses empirically the nature and the incidence of creative accounting.	1999-2001	Spanish larger listed companies which managed to earn during the period of observation	The earning due to creative accounting practices was 20% of total reported earnings.	The direction of creative accounting could be related to economic conditions.
Armstrong, Jagolinzer & Larcker	2010	It is examined the association between CEO equity incentives and accounting irregularities.	2001-2005	CEO-firm observations	No evidence is found that higher equity incentives are associated with a higher frequency of accounting-related lawsuits.	There is not a relationship between CEO equity incentives and accounting irregularities, but in firms where CEOs have a higher level of equity incentives the occurrence of accounting fraud is lower.
Beasley	1996	The paper examines if the presence of a larger proportion of outside members on the board of directors reduces accounting fraud.	1980-1991	150 publicly traded firms	Fraud firms have a board with 50.2% of their membership composed of outside members, while no-fraud firms have a board with 64.7% of outside members.	The proportion of outside members is lower for firms which experienced financial statement fraud.
Beneish	1999	It verifies the applicability of a model to firms in order to detect those which manipulate earnings.	1982-1992	74 companies which manipulated earnings	The percentage of detected manipulators is above 70%, and the percentage of those incorrectly identified is quite low (15%).	Beneish M-score model can distinguish between the manipulator and non-manipulator companies.
Benford	1938	Benford started its study by observing the first	-	20229 observations	-	Benford's law provides expected schemes of the digits in numerical

Author	Year	Objective of the paper	Period of observation	Sample	Statistical Results	Conclusion
		digits distribution.				data. Commonly, these collections of numbers have a leading significant digit which is likely to be small. So, Benford's law contributes in the individuation of these significant digits. The Law of Anomalous Numbers is thus a general probability law of widespread application.
Bhasin	2016	It is an investigation of fundamental skills, education and training requirements of a forensic accountant.	2011-2012	120 practicing CPAs, accounting academics and users of FA services	Auditing skills, critical/strategic thinking, effective oral/written communication and identify key issues are the skills, identified by the survey, with a higher mean.	These results show that some skills are relevant to the education of a forensic accountant. Educators should use the outcomes as a guideline in their work.
Carroll	1979	It tries to analyse with a conceptual model what is included in the Corporate Social Responsibility and which are the social issues in an organization.	-	-	This corporate social performance conceptual model is intended to be useful for both academics and managers. For academics, the model is primarily an aid to perceiving the distinction among definitions of social responsibility that have appeared in the literature. The model depends on three aspects: social responsibility categories (discretionary, ethical, legal and economic responsibilities); social issues involved; philosophy of social responsiveness.	The model can be used to help managers conceptualize the key issues in social performance, to systematize thinking about social issues, and to improve planning and diagnosis in the social performance realm.
Chih, Shen & Kang	2008	It examines the relationship between Corporate Social Responsibility and earning management.	1993-2002	1653 corporations in 46 countries	Regarding earning smoothing, coefficients of CSR are negative and significant (opposite relationship). Regarding earning aggressiveness, coefficients of CSR are positive (direct relationship). Regarding earning losses avoidance, when non-CSR is considered the value of EM is 7.893 and 8.126 (direct relationship).	The relationship between CSR and EM depends on which type of earning management is considered. CSR influences positively earning aggressiveness, and negatively earning smoothing and earnings losses avoidance.
D'orazio	2003	It aims to give an explanation of Corporate Social Responsibility (CSR) and to analyse the main differences between stakeholder and stockholder view.	-	-	-	There are 2 opposite ethical theories behind the CSR (stockholders and stakeholders theory). Sometimes these two theories may give the same outcome. In conclusion, the motivations which bring a

Author	Year	Objective of the paper	Period of observation	Sample	Statistical Results	Conclusion
						manager to value stakeholders' interests is what distinguish these theories.
Diekmann & Jann	2010	It is investigated the reliability of Benford's law.	2003-2006	Data observations on regression coefficients from 117 published articles	The expected proportion of 'false positive' test results is larger than the nominal alpha-error. It is doubtful that a test based on digits distributions is a valid tool to identify a manipulated article.	Authors doubt about the application of Benford's law in the detection of manipulated and non-manipulated estimates because it should have a low level of 'false positive' and 'false negative'.
Digabriele & Huber	2015	It looks for those topics of forensic accounting which received no attention inside scientific literature.	2000-2014	366 papers	Fraud is the first topic (at 45.1%) of all papers. Then, there are quantitative archival, forensic accounting and practice, and instructional methods. Inside research topics, there are instructional methods (26%, 97 papers) and quantitative archival (24%, 88 papers).	Results suggest that forensic accounting researchers are trying to emulate the topics analysed by accounting researcher. Forensic accounting is a confluence of many disciplines, so the research should concern more law, auditing, finance, economics, psychology, criminology and sociology topics.
Digabriele	2009	It is analysed if there is a common agreement between auditors, accountants and accounting academics that forensic accounting should be merged with auditing.	2007-2008	253 surveys between a forensic accountant, auditors and accounting academics	The answers to the survey show that these 3 groups of professionals agree that the environmental framework, created by the standard setters, with several reforms and regulations, makes necessary a merger between FA and auditing.	The results indicate that FA could have a place in the audit process, and the auditors should add some FA's expertise to their profile.
Dyck, Morse & Zingales	2010	It is analysed the most effective mechanism for detecting fraud.	1999-2004	The final sample consists of 216 U.S. firms against which a securities class action lawsuit has been filed	The results show that the detection of fraud relies on many actors, each of them accounts for less than 20% of the total amount of detection. Auditors account for only 10.5% of the cases detected, while employees account for 17% of the cases.	The incentives network behind whistleblowing is weak, and it seems that employees do not gain much from reporting the fraud.
Enriques & Volpin	2007	It aims to identify the differences between companies' ownership structures and to analyse corporate governance reforms in Europe.	1991-2005	Ownership structures of LVMH, Telecom Italia and Volkswagen AG; and CG reforms in France, Germany and Italy	-	Despite corporate law reforms, done in these countries, too little has been done in related-party transactions. Therefore, European policymakers, adopting US style reforms mostly focused on the agency problem, have not considered dominant shareholder issues.
Fernandes & Guedes	2010	It is analysed how the different economic settings are related to the	1978-2004	Enforcement actions started by the SEC	A low number of firms inflating earnings with a GDP growth. On the other hand, when it is not expected a	Managers inflated earnings more when the expectations regarding economic activity were high, to

Author	***Year***	***Objective of the paper***	***Period of observation***	***Sample***	***Statistical Results***	***Conclusion***
		incidence of accounting fraud, focusing most on the behaviour and motivations of managers.			GDP growth, there are many firms that decided to inflate their earnings.	avoid being seen as incompetent. And, when economic expectations were good, there were few managers who inflated earnings.
Gbebi & Adebisi	2014	The forensic accounting skills and techniques applied in the investigations process in the Nigerian public sector are examined.	2012-2013	190 senior staff for three Anti-Corruption agencies	From the questionnaire emerged that forensic accounting skills and techniques have a significant impact on the detection of accounting fraud.	The application of forensic accounting in the Anti-Corruption agencies in Nigeria helped to uncover fraud and to reduce the occurrence of them.
Grove, Patelli, Victoravich & Xu	2011	The paper analyses a hypothetical connection between corporate governance and the performances of US banks during the financial crisis.	2006-2008	236 public commercial banks	The level of block ownership is positively related to financial and stock performances; the level of anti-takeover devices adopted is negatively related to financial performances, and the level of debt is negatively associated to financial performances and loan quality.	Corporate governance is a central topic in the occurrence of corporate fraud. It emerged that effective regulation of banks and synchronous effective corporate governance mechanisms could be able to fight fraudulent events.
Hegazy, Sangster & Kotb	2017	It investigates the nature of forensic accounting in the UK with a questionnaire.	2016-2017	262 heads of forensic services firms	81.5% of people working in forensic accounting are qualified accountants. 100% essential skills identified in the questionnaire and in the interviews are communication (oral and written) skills, the ability to analyse and interpret financial information, and fraud investigation skills.	Forensic accounting in the UK is a field dominated by professionally qualified accountants. The most critical skills of forensic accountants were identified as communication and analytical skills, along with problem-solving and investigative skills.
Hoi & Robin	2010	It is analysed if the executive and non-executive directors face the same penalties when an accounting fraud is revealed.	2000-2001	171 directors	77% of executive directors lost their board seats in the incriminated firm by the third fiscal year after the detection of the fraud. Whereas for non-executive directors the rate passes to 55%. Authors found equal consequences for executives and non-executives directors.	Executive directors are more than twice as likely to lose own firm board seat and at least five times as likely to lose at least one outside directorship. Moreover, all executives appear to face similar tough penalties.
Hopkins, Maydew & Venkatachalam	2015	It is examined the influence of General Counsel in the quality of the financial reporting statement.	2001-2011	13103 firm-years listed in Compustat and ExecuComp	Firms with a GC in top management have lower accruals quality, and highly compensated GCs facilitating aggressive reporting practices (i.e. income-increasing discretionary accruals) in their firms.	Highly remunerated GCs are associated with lower financial reporting quality.
Huber & Digabriele	2014	It is a critique of Stone and Miller's (2013) paper on what matters in forensic accounting research.	-	-	-	After having analysed the paper of Stone and Miller, authors defined forensic accounting and the several parts that are related to it. The present stage of forensic

Author	***Year***	***Objective of the paper***	***Period of observation***	***Sample***	***Statistical Results***	***Conclusion***
						accounting research is in search of an identity, and it is possible to answer ' what matters' in FA research only once the purpose is defined.
Jensen, Murphy & Wruck	2004	It is a reexamination of CEO remuneration, that has more than the usual amount of energy and substance, and provide history, analysis and over three dozen recommendations for reforming the system surrounding executive compensation.	-	-	-	While executive compensation can be a powerful tool for reducing the agency conflicts between managers and the firm, compensation can also be a substantial source of agency costs if it is not managed properly.
Johnson & Grazioli	1993	It is investigated the kind of knowledge associated with success in the financial statement fraud detection.	-	-	-	One of the main strategies to detect deception is reasoning on the deceiver's goal.
Kaplan, Pany, Samuel & Zhang	2012	The intentions to report fraud using anonymous and non-anonymous channels are examined in this study.	2010-2011	65 MBA students	Non-anonymous reporting intention means are significantly lower under the not present condition (transgressor has not faced negative repercussions) compared to the present condition (transgressor has faced negative repercussions). Anonymous reporting intention mean is significantly higher than the non-anonymous reporting intention mean if the transgressor has not faced sanctions or has been fired.	Findings suggest that the availability of an anonymous reporting channel increases reporting intentions when previous whistleblowing had a negative outcome for the whistleblower.
Kolar & Zdolsek	2013	In the study are examined the thoughts of state prosecutors and criminal investigators related to forensic accounting and fraud investigations.	2013	Criminal Investigators and State Prosecutors in Slovenia	CI and SP interviewed stated that they do not possess enough knowledge in accounting to investigate in a fraud case. Indeed, during the investigations, they receive unofficial help, advice and opinions, by accounting professionals.	Forensic accounting knowledge would benefit fraud investigations and help state prosecutors during the investigation process.
Law	2011	The paper analysis the organizational factors that are related to the absence of fraud.	2009-2010	253 CFOs	The logistic regression results show that audit committee effectiveness, internal audit effectiveness, the tone at the top, and ethical guidelines/policy are all significantly associated with the absence of fraud in organizations.	This Hong Kong study has found audit committee effectiveness, internal audit effectiveness, the tone at the top, and ethical guidelines and policies to be positively associated with the absence of fraud in organizations.

Author	***Year***	***Objective of the paper***	***Period of observation***	***Sample***	***Statistical Results***	***Conclusion***
Macgregor & Stuebs	2014	Few people decide to blow the whistle when the opportunity is presented. So, it is analysed why there is a fallacious silence with a survey conducted on undergraduate students.	2012-2013	79 undergraduate students	The perceived awareness that an action should be prohibited is strongly and negatively correlated with the corresponding willingness to remain silent. The influence of a performance culture is strongly positively associated with the willingness to remain silent. Both perceived higher institutional standards and time spent on academics are negatively associated with the dependent fallacious silence variable.	In conclusion, evidence shows that the willingness to rationalize fallacious silence is related to community and cultural influences and personal traits, and the authors suggest to focus on developing and supporting the individual to limit rationalization (a central issue in the triangle fraud theory).
Micewski & Troy	2007	Authors address the theory of ethical decision-making and deontological ethics for business executives, and explore the concept of “moral duty”.	-	-	-	Although accounting fraud may appear as a quick solution, longer term effects of misconduct make ethical implications more apparent. A real change in the business world, with an ethical tendency, could be achieved only with some self-regulating measures of deonthologically ethic inside companies.
Miller & Shawver	2016	This study surveys faculty about what is being taught and how much time is dedicated to ethics training.	-	146 accounting faculty members from 72 universities	For the 72 institutions responding, we find that business ethics modules are required at 18.06% of the institutions and are elective at 44.44% of them while accounting ethics are required modules at 15.28% and are elective at 20.83% of them. Respondents report that they dedicate 7.83% of their curriculum to ethics topics when integrated.	The study suggests that the coverage of ethics has not changed much over the last two decades and fails to cover the content necessary to positively impact student ethical development.
Nigrini & Miller	2009	A new second-order test is described, improving the Benford's law.	-	4 cases: corporate accounts payable data; corporate journal entry data; franchisor restaurant data; franchisor restaurant data seeded with errors.	The second-order test analyzes the digit patterns of the differences between the ordered values of a data set. In most cases, the digit frequencies of the differences will closely follow Benford’s law. While the usual Benford’s law tests are usually only of value on data that is expected to follow Benford’s law, the second-order test can be performed on any data set.	This paper introduced a new second-order test of Benford’s law, based on the fact that if the records in any data set are sorted from smallest to largest, then the digit patterns of the differences between the ordered records are expected to closely approximate Benford’s law in all but a small subset of special circumstances. The second-order test has the potential to uncover errors and irregularities that would not be discovered by traditional means.

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Pansarella	2007	The purpose of this paper is to analyse some regulations in D.Lgs 231/2001 and L. 262/2005.	-	-	-	L. 262/2005, introducing the figure of financial reporting manager, has enforced the control on the budget management process (not so considered by D.Lgs 231/2001).
Quirin & O'Bryan	2014	The following article examines a real case where forensic accountants (the authors) worked, in order to show the techniques applied.	-	-	-	The role forensic accountant could be useful to support and to add value in many areas of litigation.
Rijsenbilt & Commandeur	2013	It is explored if there is a relationship between possible indicators of CEO narcissism and fraud.	1992-2008	953 CEOs	CEO narcissism is measured with 15 plausible objective narcissism indicators which fit the mean conceptualization of narcissism. The results show that there is a statistical positive relation between plausible proxies for CEO narcissism and fraud.	The analysis confirms the perspective that narcissistic CEOs behave unethically to obtain their goals and satisfy their constant need for praise and admiration.
Rossi	2006	It investigates the role of Financial Reporting Manager (c.d. "dirigente preposto") in the Italian context.	-	-	-	In the paper, the main features of FRM are analysed. Then, the author identifies the major duties and responsibilities that the FRM has.
Shnatterley	2003	The paper analyses white collar crime occurrence and which are the factors that could cause it.	1988-1998	204 articles containing an announcement of a white-collar crime	Operational governance, including clarity of policies and procedures, formal cross-company communication, and performance-based pay for the board and for more employees, significantly reduces the likelihood of a crime commission.	The following article generates a set of operational governance components that have the potential to reduce crime and its associated costs to the firm (around 1-6% of total incomes).
Shah Ali, Butt & Bin Tariq	2011	The reasons why managers decide to do creative accounting and the ways how they become successful are examined.	-	-	Among the several reasons that lead a manager to do creative accounting, authors identified: meeting internal targets, meeting external expectations, providing income smoothing, window dressing for an IPO or loan, taxation and changes in management.	The improper use of creative accounting has fooled both regulators and authorities, due to the difficulties in its detection. So, it seems quite impossible to stop this phenomenon.
Soltani	2014	It aims to analyse the major similarities and differences between 3 American corporate failures and 3 European corporate failures.	2001-2003	6 corporate failures (Enron, WorldCom, HealthSouth, Parmalat, Royal Ahold, and Vivendi Universal)	-	The analysis of these corporate scandals demonstrates that the ethical dilemma has been added to inefficient corporate governance and internal control, accounting irregularities, failure of external auditors and dominant CEOs.

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						Furthermore, poor ethical climate and lack of willingness of CEOs in defining the core values such as accountability, control, deontology, independence, integrity and responsibility led to these scandals.
Soltani & Maupetit	2015	Authors investigate the importance given to core values of ethics, integrity and accountability in the European codes of CG.	1990-2009	European laws, regulations and codes of corporate governance	-	European Commission and regulators should implement clearer policies with regard to 'tone at the top', ethical values and accountability mechanisms, particularly for management.
Sorensen & Miller	2017	The paper analyses the US and the Italian legislation and reforms before and after two financial scandals which occurred in each of these countries.	-	-	-	Although Enron and Parmalat financial scandals had many elements in common, the way how the two regulators reacted was quite different. Indeed, US responded immediately with the SOX, while Italy made some changes but waited until 2006 with Savings Law to reform its system. At the same time, EU regulators inspired their reforms to the American ones.
Troy, Smith & Domino	2011	It investigates how CEOs demographic factors influence the choice to engage in accounting fraud.	1992-2004	312 publicly traded firms (of which 156 fraud firms)	The CEOs of fraud firms were less likely to have a business degree, and have held on average 1.46 functional positions in the company (CEOs of the control firms held nearly 2 functional positions).	The demographic variables (experience and business education) are negatively associated with accounting fraud.
Wolfe & Hermanson	2004	Authors believe that the fraud triangle theory could be improved in the detection and prevention of fraud by considering the fourth element.	-	-	CEOs were implicated in the 70% of public company accounting fraud, where check and balances were not sufficient to mitigate the CEO's capability to commit fraud.	If capability could play a role in influencing the other fraud elements, checks and balances or detection systems should be increased and auditors should expand audit scope, procedures, and testing for potential capability using fraud risk diamond model.