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**A new empirical analysis of the relation between the
board characteristics and corporate fraud**

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For those who have always been at my side and believed in my dreams.

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1. INTRODUCTION

In the last decades, financial scandals have been the major drivers of global economic crises. As we have all experienced, preventing and limiting accounting frauds has become a necessary and imperative activity to ensure a stable economy. For this reason, in recent years, various analyses have been carried out and articles have been published about red flags and everything that could be a cause or correlation with fraud.

The purpose of this elaborate is to confirm the results of Beasley (1996) and Farber (2005), i.e. to demonstrate that even today, despite the introduction of new laws and regulations, board independence remains correlated with the presence or absence of fraud and that companies guilty of fraud will try, after being discovered, to improve their boards from the point of view of composition. The further objective, that has still not been addressed in the sector literature, is to identify possible greater correlations between specific types of fraud (financial statement fraud, unaudit/lack of internal control and bribery) and characteristics of the board or control systems. The first article to suggest a correlation between the efficiency of the board against frauds and its composition is that of Fama and Jensen (1983). In it, it is determined that the board is the control mechanism determinant for the monitoring of top management. Baysinger and Butler (1985) on the other hand look for correlations between firm performance and board composition. Lee et al. (1992) have shown that companies with a higher proportion of outside directors are more resistant to management buyouts; Brickley and James (1987), on the other hand, find that a higher proportion of independents reduces average board salaries. Finally, Weisbach (1988) showed that the presence of independents leads to greater turnover of management when it is

performing poorly. Williamson (1984) demonstrates that, as agency theory suggests, management will always have a knowledge advantage over the board, and therefore the lack of independence can be detrimental to shareholders' interests. Starting from this evidence of the great impact that the composition of the board and the structure of governance have on the various company performances, Beasley (1996) finally demonstrated how the presence of independents was also linked to the lower occurrence of company fraud. Consequently, as the number of independent members increased, the probability of fraud decreased. Farber (2005) instead shows that companies and stakeholders have understood the importance of independence and balance in the board and that consequently in the case of fraud there is both the will of the company to recover the trust of investors by rebalancing the board and the will of the shareholders to have a "safer" board in the years just after a fraud. Following these studies and the financial scandals that shook the first decade of the 2000s, regulators in more advanced countries, such as the USA and Europe, have also taken measures by introducing, at least for listed companies and therefore with greater weight in the event of bankruptcy, obligations and restrictions in the composition of the board and governance (professionalism requirements, at least 50% independent, new control bodies...). This study, therefore, aims to ascertain whether, after this evolution in regulations and knowledge, the composition of the board still remains an element related to fraud and whether, in any case, companies maintain their reaction to further board improvement. Furthermore, we will try to find further correlations between specific frauds and specific company characteristics.

The paper is composed of three macro areas. The first will be related to corporate governance, its origins, why it is the fulcrum of connection between investors and governance and how to identify conflicts of interest that can generate fraud. The second part will be related to fraud,

its types and how it should be detected and countered. Finally, the third and final part contains a statistical analysis conducted on more than one hundred companies listed on the U.S. stock exchanges in order to confirm or refute the hypothesis of how independent directors and other characteristics of companies can be related to a greater or lesser presence of fraud.

2. CORPORATE GOVERNANCE

2.1 THE ORIGIN OF CORPORATE GOVERNANCE

The prototypes of joint-stock companies date back to the Middle Ages. Particularly in the maritime republics, since it was very risky to transport goods by sea (due to storms and looting), they began to divide the cargo of ships into "equal parts". By doing so, many small and medium-sized investors could finance a single ship without one person having to bear all the risk, and they could decide to buy a small or large number of "parts" depending on the risk they were willing to take. The birth of modern corporations, however, can be traced back to the colonial companies of the eighteenth century. Large colonial expeditions were very expensive to organize and therefore it was necessary to use funds from different financiers who would then share the profit.

Until that historical moment, the owner and financier of the company had always been also the manager, without necessarily needing to delegate other subjects. The emergence of a series of many and small owners (shareholders) and consequently the need for the appointment of one or a few directors in the face of multiple owners has given rise to corporate governance. Sheridan and Kensall, (1992) defined it as "A system of structuring, operating and controlling a company such as to achieve the following: (i) fulfill the long-term strategic goal of the owners; (ii) consider and care for the interests of employees; (iii) take account of the needs of the environment and local community."

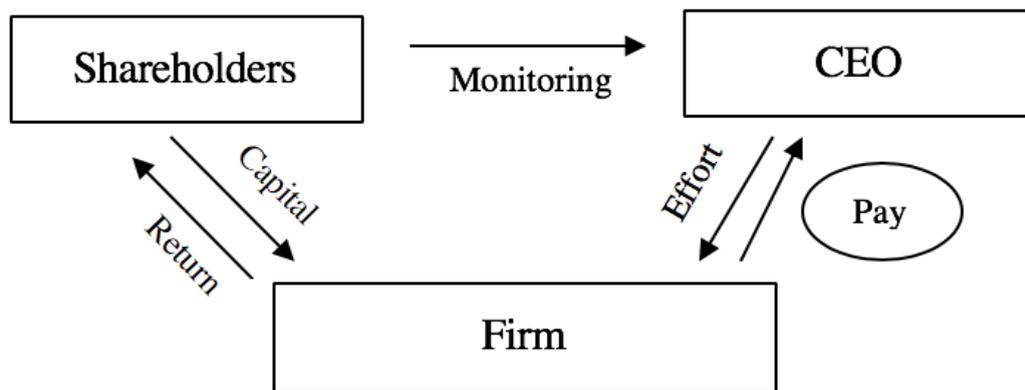


Figure 2.1.1 : Interest connection between governance actors

The creation of boards of directors as a proxy for investors, however, has also generated conflict situations explained by Jensen and Meckling (1976) in the Vertical Agency Theory.

This theory is based on the fact that the director(s) of the company and the shareholders will have different goals and desires.

Already in 1776, Adam Smith in his book *Wealth of Nations* stated: "... it cannot well be expected that they (managers) should watch over it (joint-stock company) with the same anxious vigilance with which the partners in a private company frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honor and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, on the management of the affairs of such a company."

While the investor often simply wants an increase in the value of its shares and the obtaining of dividends, administrators will want to maximize their bonuses and their salaries. To coincide the desires of the administrator with those of the shareholders often it resorts to bonuses based on the performance of the company. In this way, at least theoretically, the director should be encouraged to do his best to manage the company as well as possible. But dividends and shareholder value are

often short-term objectives that can lead to inaccurate management of the company.

Moreover, the desire to achieve results at any cost is one of the biggest drivers of corporate fraud.

For this reason, over the decades, the regulation and composition of boards and other control bodies of companies have gradually changed to optimize the probability that the director does not defraud and that the company gives a true and honest representation of its performance. In addition, the most recent crises have shown how the failure of a company is no longer an isolated case that can be easily controlled, but globalization has created a dense network of connections of various kinds, suppliers, clients, stakeholders, and as 2008 has shown, the failure of one big company alone can lead to a massive chain effect.

For this reason, it has become increasingly important to create a system of internal and external control of companies that can guarantee security to all stakeholders and not only to shareholders.

2.2 BOARD OF DIRECTORS AND STOCKHOLDERS

As we have seen, the governance of the company was born as a proxy for ownership. Since the shareholders cannot monitor and manage the company in person, they use the meetings to appoint representatives to manage the company on their behalf. Shareholders may be different in terms of type and quantity of shares, which is why the laws of the various states require that the various minorities also have the right to representation. The decision of the composition of the board of directors

is made by a majority vote at the meeting. This is to ensure that the directors at least serve the interests of the majority of shareholders.

The main body elected by the shareholders' meeting is the board of directors. It has two basic roles:

- **Strategic role:** formulating and implementing the corporate strategy and selecting top management.
- **Controlling role:** monitoring the performance, checking that the company has proper policies and codes of ethics, set salaries and oversee internal control.

However, this is not a sufficient assurance that elected directors and top management are only looking after the interests of shareholders and the company without regard to their interests. For this reason, over the years, laws have been increasingly refined to provide for a series of bodies and mechanisms, both internal and external to the company, that are capable of providing sufficient assurance of the effective management and performance of the company.

2.3 INDEPENDENT CHAIRMAN AND LEAD INDEPENDENT DIRECTOR

The most important role of the board is certainly the chairman. It convenes, chairs and guides all the activities of the board. This leads to the automatic recognition of the chairman as the guarantor of the board's activities.

For the interests of shareholders to be pursued in the best possible way, the board must not have dominant figures or be unbalanced in power relations, although it is not always prohibited. So while the chairman should have a more detached and general view of the company, the CEO has the task of planning the company's strategy in detail. Consequently, it

is almost essential that the chairman should have a certain degree of independence to implement good corporate governance.

Various national and international regulations strongly recommend that the chairman should not be nor have had important positions in the management of the company. In addition, to be even more independent in his functions, he should not have any kind of interest directly related to the company apart from remuneration, which should be determined according to national and international guidelines.

In some cases, however, it is possible that a non-independent chairman could be a positive figure. For example, if the chairman is the founder of the company or perhaps is the major shareholder, he would be led to pursue the best interests of the company since he is the major beneficiary. Also in this case, as we will see in the next chapter, it is advisable to have several independent directors to ensure opinions that are not directly influenced by the close relationship with the company.

However, if the chairman is not independent, it is advisable and in some cases obligatory (for example, it is present in the listing requirements of the London Stock Exchange) to explain in the financial statements why a non-independent chairman was elected and what guarantees there are that this conflict of interest will not have repercussions on the reliability of the management of the company.

A good practice to mitigate the effect of a non-independent chairman is to elect a lead independent director. This person should represent the "independent" voice, confirming that the chairman's choices are not influenced by conflicts of interest.

The chairman presides over the meetings of the directors, draws up the agenda and acts as a mediator. Moreover, being the representative of the shareholders, he also has the task of representing the values and the seriousness of the company, guiding the board, drawing up the objectives

together with the CEO, identifying any conflicts of interest of the other members, informing the other directors on important events, regulating relations with the major shareholders and stakeholders, and above all ensuring that the indications and decisions taken by the board are implemented.

The main task of the lead independent director, on the other hand, is to confirm that the decisions taken by a non-independent chairman are not influenced by personal interests. The lead independent director can be placed in office either for certain periods or for as long as is deemed necessary due to conflicts of interest.

These roles are fundamental to the correct functioning of the board of directors and, consequently, both shareholders and stockholders attach great importance to the presence of independence at the top of the board. For this reason, it is important that the independence of the chairman is verified and that at least, in the case in which it is not possible, there is a lead independent director and an explanation of why strategically it was chosen to have a non-independent chairman.

2.4 INDEPENDENT DIRECTORS

If the CEO has too much power and too little oversight, it can be detrimental to the company. That is why it is important not only to have an independent chairman but also independent directors. This issue has already been addressed by Farber (2004) and Beasley (1996) and over time has been recognized by some countries that have made it a requirement to have a certain percentage of independents on the board. Fama and Jensen (1983) outside directors have incentives to carry out their monitoring tasks and not to collude with top managers to expropriate stockholder wealth.

The board must try to consider and satisfy a wide range of interests: the CEO, the financiers, the employees and the other shareholders. The main purpose should be to make decisions in a disinterested way and only in favor of the company. To encourage a more disinterested board in making decisions, in recent decades the figure of the independent director has appeared and taken hold.

The NASD rulemaking drafted by the Financial Industry Regulatory Authority (FINRA) and filed with the SEC defines the independent director as:

“ “Independent director” means a person other than an officer or employee of the company or its subsidiaries or any other individual having a relationship, which, in the opinion of the company's board of directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. The following persons shall not be considered independent:

(A) a director who is, or during the past three years was, employed by the [corporation] company or by any parent or subsidiary of the company [any of its affiliates for the current year or any of the past three years];

(B) a director who accepts or who has a Family Member who accepts any [compensation] payments from the [corporation] company or any [of its affiliates] parent or subsidiary of the company in excess of \$60,000 during the current fiscal year or any of the past three fiscal years [previous fiscal year], other than compensation for board service, payments arising solely from investments in the company's securities, compensation paid to a Family Member who is an employee of the company or a parent or subsidiary of the company (but not if such person is an executive

officer of the company or any parent or subsidiary of the company), benefits under a tax-qualified retirement plan, or non-discretionary compensation (provided, however, that audit committee members are subject to heightened requirements under Rule 4350(d));

(C) a director who is a [member of the immediate] [f]Family Member of an individual who is, or [has been in any of] during the past three years was employed by the [corporation] company or by any [of its affiliates] parent or subsidiary of the company as an executive officer[. Immediate family includes a person's spouse, parents, children, siblings, mother-in-law, father-in-law, brother-in-law, sister-in-law, son-in-law, daughter-in-law, and anyone who resides in such person's home];

(D) a director who is a partner in, or a controlling shareholder or an executive officer of, any [for-profit business] organization to which the [corporation] company made, or from which the [corporation] company received, payments (other than those arising solely from investments in the [corporation's] company's securities) that exceed 5% of the recipient's [corporation's or business organization's] consolidated gross revenues for that year, or \$200,000, whichever is more, in the current fiscal year or any of the past three fiscal years;

(E) a director of the listed company who is employed as an executive officer of another entity where any of the [company's] executive[s] officers of the listed company serve on [that entity's] the compensation committee of such other entity, or if such relationship existed during the past three years; or

(F) a director who is or was a partner or employee of the company's outside auditor, and worked on the company's audit, during the past three years.”¹

This definition outlines the optimal profile of an independent director. Also the independent director is expected to be someone who is loyal, able to mediate between parties, dedicated, diligent, and above all, knowledgeable and authoritative enough to secure ownership and be persuasive to other board members, without being submissive or subservient to the decisions of other non-independent directors. In fact, just the reluctance and resistance of non-independent directors to hire independent directors shows the importance of their role. Furthermore, although it has not been proven that the presence of independents leads to greater earnings, it is certainly not a negative factor that in the decision-making process an expert and authoritative figure can give his opinion on projects.

The remuneration of independents is also important to evaluate. In fact, if they are paid too little, there is a risk that they will be more easily corruptible, or, as Maslow (1970) teaches us in his pyramid, that they will make less of a personal contribution to the decision-making process, not feeling sufficiently remunerated. In addition, it is advisable that independents should not have any part of their remuneration linked to company performance. In fact, stock options or other performance-based compensation would cause directors to lose their independence, as they would be more motivated (as we will see in the next chapter) to commit fraud. To help solve this problem, the European Union has issued a series of recommendations to help decide what is the most effective remuneration for directors.

¹ From NASD rulemaking (2003) : <https://www.sec.gov/rules/sro/34-47516.htm>

As the NASD also indicates, independence is not only linked to monetary return but also to relationships with people in the company. To be independent, therefore, a director must not have any family member, close relative or person economically linked to him or her among the principal shareholders of the company. Should this happen, the independent director to maintain his status must be able to provide adequate guarantees and justifications, otherwise he can be removed.

As we have mentioned, the presence of an outsider can become an asset not only for the independence of the outsider but also for their skills. Having to select an individual disconnected from the company, there is nothing to prevent identifying someone with specific knowledge of the areas in which the company wants to evolve, without having to resort to external consultants or hire additional management. This can be crucial for small firms with few resources to devote to experts, or for rapidly expanding firms that need to specialize in new areas quickly. For example in management buyouts, shareholder wealth increases when boards are dominated by outside directors (Lee et al. 1992);

Therefore we can conclude that: the independent director, already identified in previous studies as a key element in combating fraud, has also been recognized by the various institutions as fundamental, thus being made mandatory on many occasions. In addition, his presence, in addition to reassuring the stakeholders and rebalancing the board, allows obtaining an advantage thanks to the personal knowledge that he can use in the decision-making process of the board.

2.5 AUDIT COMMITTEE

Another corporate body established with the main purpose of controlling the company is the audit committee. It is a body whose purpose is to oversee the company's accounting and internal controls. The audit committee must have a thorough understanding of the various accounting processes and how the financial statements are generated. The firm should be able to offer its services to its clients promptly. The external auditor interfaces primarily with the audit committee and not with management, to preserve independence and percipient problems or indications. The firm should be able to meet the needs of its clients promptly. The audit committee should be free to set an appropriate budget both for its activities and for the compensation of the internal auditor. This is the only way to ensure that the resources deployed for both internal and external auditing of the firm are sufficient to provide adequate security for investors.

In the regulations of some countries and stock exchanges (such as Nasdaq and New York Stock Exchange) the entire committee must be composed of independent directors and in some cases even that at least one of the members is by qualifications and merits considered an accounting expert. Since 2003, the SEC has required that companies that trade in shares must have an audit committee composed following the Sarbanes-Oxley Act of 2002.

The definition in the NASD regulation filed with the SEC states:

“ Audit committees are required to have a minimum of three members and be composed only of independent directors. In addition to satisfying

the independent director requirements under Rule 4200, audit committee members must satisfy the heightened independence standards provided in Section 10A(m)(3) of the Act: they must not accept any consulting, advisory, or other compensatory fees from the company other than for board service, and they must not be an affiliated person of the company. For purposes of determining whether a person is an affiliate solely by stock ownership, an audit committee member will be considered an affiliated person of the issuer if such member owns or controls, directly or indirectly, 20% or more of the company's voting stock, or such other lower threshold as the SEC may establish. Nasdaq would also consider the employee of an entity that owns or controls such securities as an affiliated person.

All audit committee members must be able to read and understand fundamental financial statements, including a company's balance sheet, income statement, and cash flow statement at the time they join the board. In addition, at least one audit committee member must have past employment experience in finance or accounting, requisite professional certification in accounting, or any other comparable experience or background which results in the individual's financial sophistication, including being or having been a chief executive officer, chief financial officer or other senior officers with financial oversight responsibilities.”²

² From NASD rulemaking (2003) : <https://www.sec.gov/rules/sro/34-47516.htm>

2.6 TRIPLE DEFENCE LINE

The Institute of Internal Auditors (IIA) published a global position paper in 2013, titled: The Three Lines of Defense in Effective Risk Management and Control.

In this paper, the three lines of defense that can be considered when talking about corporate internal control were defined. In fact, all functions, to a greater or lesser extent, must be committed to controlling business processes and events. This outline serves to communicate and clarify the various control responsibilities to the various business functions.

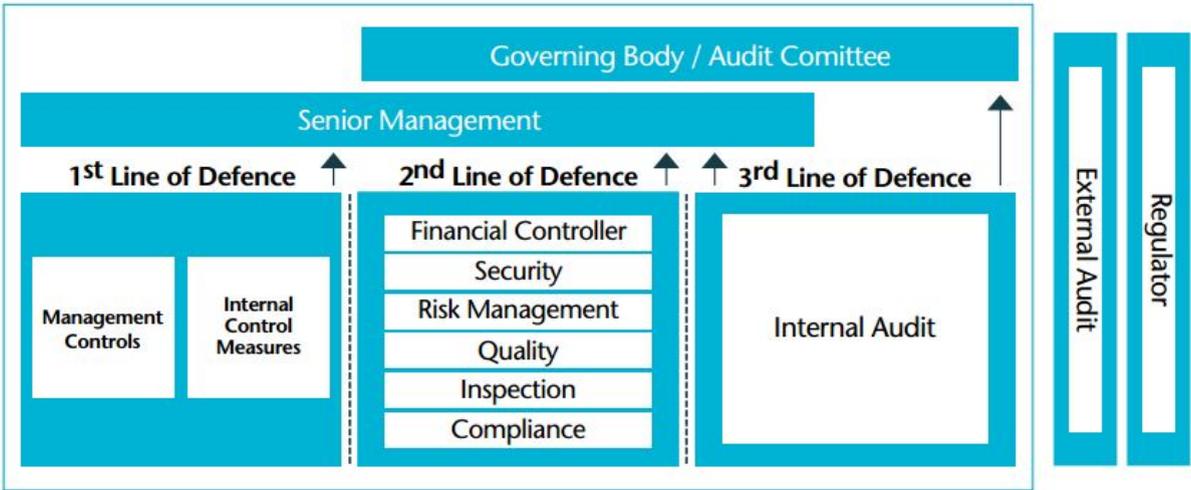


Figure 2.6.1 : Triple defense line ³

Specifically, the three lines of defense are:

- Management Control:** In this line of defense the responsible parties are the managers and the employees themselves who will be responsible for pursuing the objectives assigned to them. For this

³from:
<https://www.icas.com/professional-resources/audit-and-assurance/internal-audit/internal-audit-three-lines-of-defence-model-explained>

reason, they will ensure that they have the skills, knowledge and information necessary to complete their activities without breaking the law, and indeed by controlling their actions and those of their subordinates.

To be able to do this, it is obviously important that all levels of the firm are aware of the policies and code of ethics. To achieve this, the company must put in place policies to raise awareness and update employees.

- The second line of defense is made up of **functions that specialize in controlling the firm**. This line of defense develops policies, frameworks and everything else that can be used by the first line of defense to act promptly against possible risks. They also keep the situation monitored and continuously assess the risks. The second line of defense employees include quality control, security and financial controllers.
- The third line is **internal audit**.
The role of the internal audit will be analyzed in more depth in the next paragraph. To give a brief definition we can define it as a corporate function whose sole purpose is to check that the first two lines are efficient and advise in case how they can improve. They also interface with the external audit to indicate which areas may be more dangerous and which controls are already performed.

2.7 INTERNAL AND EXTERNAL AUDIT

To provide further proof of reliability over time, two functions have been created, one internal and one external to the company, which are designed solely to control the processes and the correctness of the company's accounting operations: the internal audit and the external audit.

The so-called internal audit is an activity of advice, control and verification of company procedures that are carried out by internal staff.

A definition of an audit is given by the ISO 19001 standard, which states that an audit is a "systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria have been met". Therefore, another task of the internal auditor is to verify that the internal control system based on ERM (which we will look at with the COSO report in the next chapter) is suitable for the company's structure and that, as a result, the inherent risk is minimized, that the company's processes are functioning, and that identified weaknesses are resolved. The internal auditor's task does not stop at the mere execution of control procedures but must help create the company's control culture; he or she must follow up on employee training on ethics and investigate cases of whistleblowing.

The actions and principles of the external audit are governed by the International Standards on Auditing (ISA) which are developed by the International Federation of Accountants (IFAC) through its International Auditing and Assurance Board (IAASB).

The basic principles are listed in ISA 200 and specifically are:

- The auditor must use professional skepticism, which is an attitude that includes a questioning mind, being alert to conditions that may indicate possible misstatements due to error or fraud, and a critical evaluation of the evidence.
- The auditor should recognize that circumstances may exist that cause that the financial statements are materially misstated, meaning that such an error in the accounts could affect the economic decision of users if they make their business decision based on those financial statements.
- The auditor must exercise professional judgment, applying relevant professional education, knowledge and experience as required by relevant standards
- The auditor must obtain sufficient (quantity of evidence) and appropriate(quality of evidence) to obtain reasonable (not absolute)assurance that the financial statements are free of material misstatement.

The external auditors are chosen at the annual general meeting (like management) by the shareholders.

Given that they represent an additional and external line of defense, they present their final report directly to the shareholders to reassure them of the correctness of the data presented by management.

As ISA 240 indicates, the auditor's controls must not be a mere balancing of numbers but must be exercised by consistent professional judgment and skepticism.

An audit will never be carried out by a single person but will use a team composed of several people with different levels of experience who will

brainstorm to identify possible red flags. errors or even focus on the appropriateness of the financial reporting framework used (ISA 315).

Auditors could not succeed in analyzing complex and ever-changing companies without interfacing with company management, so interviews and collaboration with staff become important not only to identify behavioral red flags but also to do an accurate job.

This is why ISA 240 expects the external auditor to conduct interviews with management to establish the fraud risk management processes.

The external auditor must also test the internal controls and the likelihood that the internal controls have been overridden by management. As we will see in the COSO report, the presence of an internal control system does not guarantee the absence of fraud. Moreover, Taylor (2011) argues that external auditors may rely too much on the internal control system and risk not noticing overriding and collusion within the system itself. ISA 315 specifically prescribes the understanding and testing of the internal controls that are relevant to the audit.

The internal audit activity's main role and responsibility is to support management in fulfilling its roles and responsibilities regarding the realization of the objectives and goals of the organization. Internal auditors are appointed by senior management and report to both senior management and the board of directors, usually through the audit committee (IIA Standard 1100). Internal auditor, however, has a role to play in the prevention and detection of fraud (Taylor 2011).

Although it is not expected of the internal auditor to be an expert in fraud risk assessment and fraud detection, it is still required that he can identify the most obvious red flags and therefore put in place systematic controls regarding the possibility of fraud.

It is therefore the responsibility of the internal auditor, should he identify signs or actual fraud during his checks, to inform the supervisory body and the board of directors through an official report.

In addition, the internal auditor, to complete his report effectively, must, on the instructions of the board of directors, hold appropriate meetings with management in which he must obtain adequate assurances as to how management intends to address the problem.

However, it is not necessary to follow the entire procedure for all reports. Depending on the seriousness and the findings of the investigation, it is possible that the problem can be addressed directly with those concerned without alarming the entire management team.

We can therefore conclude that internal and internal audit are both useful and often mandatory to ensure good coverage of fraud risk for shareholders although in different ways. While internal auditors have the task of performing the financial audit on the annual financial statements expressing an opinion on its correctness the internal audit must provide independent, objective assurance and consulting service to the organization to add value to and improve the organization's operations (IIA2011).

It must always be remembered that the assurance provided by these two functions is high but not absolute. As Krambia-Kapardis (2010) states, in the shareholders of companies with internal and external audit, an Expectation-gap is generated: they are convinced that being an auditing body, fraud is impossible and therefore security is complete. It is possible, since fraud is a voluntary act and often planned by people with high personal capacity (as we will see in the next chapter), that the act is made in a reasoned way specifically to evade the various types of control.

2.8 THE COSO REPORT

To help companies develop and implement their internal control system, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) developed a framework in 1992 that addresses this issue.

The COSO framework gives companies a framework that they can use to develop their internal control system. It helps managers and directors to define what their duties are, and consequently whose responsibility it is to control certain areas.

The use of the framework, therefore, helps to expand internal control from mere accounting control, eliminates repetitive or inefficient controls, and helps to focus on the pure purpose of the firm. It also increases stakeholder confidence in the company's internal control system,

A system of internal control is usually a process designed by the board of directors and management to ensure that reporting and compliance objectives are met. In other words, it is essentially a series of actions and controls carried out by the firm's staff intending to generate a reliable report on the firm's performance.

As we have said, the three main objectives are operational objectives, i.e., the efficiency and effectiveness of business operations, reporting objectives, i.e., being able to accurately and transparently represent the company's accounts in the financial statements, and compliance objectives, i.e., compliance with laws and regulations.

The internal control system can be divided into five main areas:

- **Control Environment:** this is the set of rules and processes that are the backbone of internal controls. The board's task in this area is to set the tone at the top, i.e. set a good example for employees. In addition, the ethical and moral values on which the company is based must be clearly defined and communicated to all employees. Having a good environment serves not only to give confidence to stakeholders but also allows you to attract and hire staff who feel reflected in the environment and who will commit to preserving it. Other methods of stimulating an ethical environment are rewards and incentives for positive behavior.
- **Risk Assessment:** it is a good rule that the company assesses the possible risks that may arise from the environment in which it operates. The risk should be considered as a multiplication between the probability that the harmful event happens and the negative impact it would have on the company's operations. Consequently, a threshold of the materiality of the risk must also be determined, therefore identifying only the most important events for which prevention and control measures will have to be studied, and if insurance should nevertheless arise.
- **Control Activities:** control activities are the procedures chosen by management to reduce and prevent the risks identified during risk assessment. They are carried out at various levels and in various business areas based on the greater or lesser presence of risk. They can be preventive or responsive, manual or automatic, such as written and virtual authorizations, checks and controls in the field.

- **Information and Communication:** Information is now the backbone of any company. The faster and more timely they are collected, the more efficient and effective internal control can be. The better the communication, the better the exchange of information between management and staff, and consequently the lower the probability of misunderstandings.

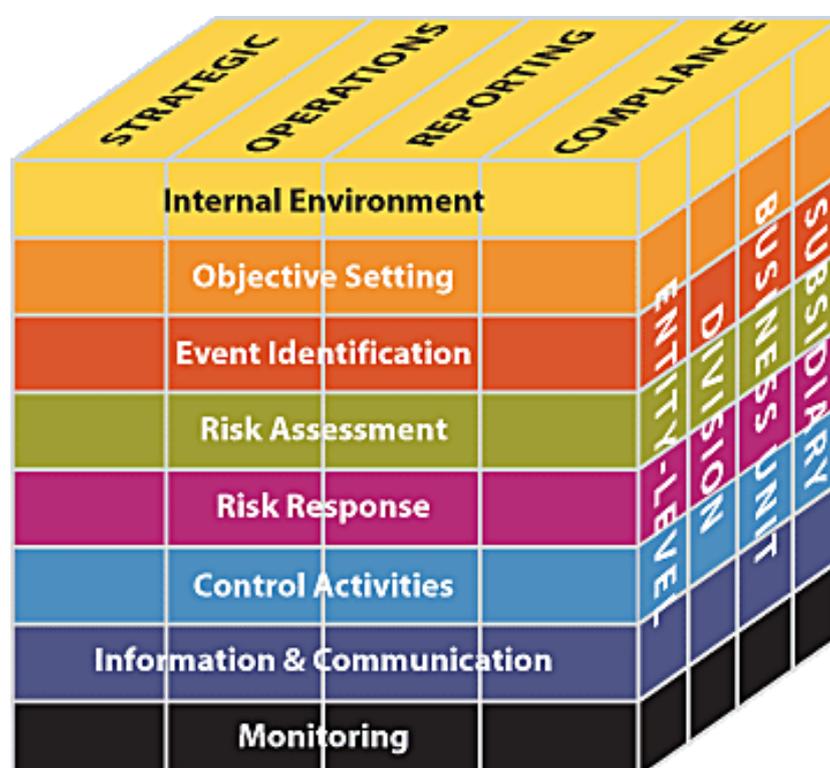


Figure 2.8.1: The COSO cube⁴

The Coso framework therefore, to ensure an adequate level of internal control, requires that:

- All areas described above are present; in particular, it is important that each of them is integrated into the control system defined by

⁴ From: The 2017 COSO Framework & SOX Compliance

the company and that effectively then the practical actions defined by the system are effective in pursuing the defined objectives.

- The areas are integrated and cooperate. This means that all areas operate in conjunction with each other and succeed in reducing risk to below an acceptable threshold.

Even if only one of the components fails to operate satisfactorily and achieve its goals, the firm cannot be considered to have achieved an efficient and effective internal control system.

When, on the other hand, the system is effective and the parties are working properly, the board can:

- Believe that ongoing operations are unlikely to experience delays and problems that could jeopardize the achievement of objectives, or at least that if one of the most damaging problems should arise, appropriate countermeasures have already been formulated and prepared that reduce the damage to an acceptable level.
- Understanding which operations were managed optimally and which could be improved, which events are detrimental to achieving objectives and what is an acceptable level of risk to consider.
- Prepare reports, matrices and periodic audits to maintain efficiency and cover changes that may occur.
- Comply with the regulations and laws of the environment in which the company operates.

However, it is important to remember that an internal control system cannot be considered infallible.

For example, hasty or poorly reasoned judgments and decisions in defining controls, strategies and risks, or the occurrence of events with great impact that could not be foreseen (e.g. the recent outbreak of COVID-19) can lead the company to fail to achieve its objectives.

So model limitations can be caused by:

- Unattainable goals
- Decisions mistaken or influenced by bias
- Errors in the processes
- The intentionality of the management in override the inner controls
- Impossible external events to preview

Since the assurance provided by the framework is broad but not absolute, the board and management will still need to engage in the other lines of defense to provide even greater assurance to their stakeholders. Having such a framework does not imply that external controls can be avoided or that they are subject to fewer regulations.

2.9 U.S Sarbanes-Oxley Act AND ISO 37001

To give even more assurance and include additional external scrutiny, the ISO 37001 Standard - Management Systems for the Prevention of Corruption was born, issued by the International Organization for Standardization in 2016.

The International Organization for Standardization is an independent non-governmental association that aims to formulate uniform and consistent parameters and criteria for companies i, creating standards at the international level that help investors to better identify the level of quality of companies.

Iso certifications are awarded voluntarily. To obtain them, companies must be inspected by ISO certifiers, who will then issue a certificate for the area inspected. Although they are voluntary given the reputation of the organization and the international standardization in controls have now become almost necessary and increasingly required by companies to ensure their stakeholders an additional level of reliability. ISO certifications as we said to cover various areas of business but in particular ISO 37001 focuses on the field of business ethics, and therefore the probability that fraud or corruption are committed.

To obtain this certification, the actions that the company has taken to mitigate the risk of fraud and corruption are assessed. In particular, three elements are assessed:

- **Risk analysis:** An assessment similar to the one we identified in the COSO report is carried out, i.e. the major risks that may affect the

company and which areas are most exposed to the risk of fraud and corruption are identified

- **Measures put in place by the company:** The tools used by the company to combat the risks indicated above are assessed, such as the security of management software, the presence of joint signatures and the operation of performance bonuses.
- **Continuous updating of control systems:** The certification is renewed annually with surprise checks by ISO certifiers.

In the early 2000's a series of financial scandals shocked America (Enron; Worldcom, etc.). The American economy and consequently the world economy suffered a hard blow and as a result, it was shown that the great accounting freedom that was granted to American companies was too much of a fraud providing an easy "opportunity" (as we have seen in the motivation part). As a result, the Sarbanes-Oxley Act was enacted in 2002 as federal law. Similar laws were soon ratified in the European Union and other industrialized countries. The purpose of the legislation is to combat accounting fraud through new obligations for companies in particular: the PCAOB (Public Company Accounting Oversight Board) was established.

This Board has the task of overseeing the accounting of listed companies and protecting the interests of investors and promote the public interest by preparing reports.

The other fundamental point of the law is the imputation of responsibility towards CEOs and CFOs. The directors of American companies are now obliged to sign the financial reports declaring that they do not detect inconsistencies or errors and consequently assuming a part of the responsibility in case fraud is detected.

Other changes introduced by the law are the prohibition of personal loans from the company to its executives, the list of documents and details that must be provided in the financial statements has been expanded and further assurances have been given in the case of conflicts of interest. Also important are the reforms regarding external auditors and the greater protection given to whistleblowers.

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3. FRAUD

In this second macro area of the paper, we will focus on defining what fraud is and what its main forms are. We will also focus on identifying what motivates people to perpetrate fraud. Understanding the methods and motives also helps us to identify patterns and signals that can serve to prevent and combat fraud. Finally, before moving on to the purely empirical part, we will look at how governance can influence its control systems analyzed in the previous area can be more or less effective in preventing and countering fraud.

3.1 MOTIVATION OF FRAUD

Let's start with a basic definition of fraud as from Black's Law Dictionary which defines it as:

"A knowing misrepresentation of the truth or concealment of a material fact to induce another to act to his or her detriment."

From this definition can be extracted what can be defined as the most important element of fraud that is the voluntariness, knowledge and concealment.

To be properly defined as fraud, it must not have been done by mistake or without intent but must have been studied and carefully concealed.

Fraud remains one of the most pressing problems for companies today. In fact, even though legislators have introduced more and more controls and obligations, fraud continues to generate large losses in both large and small companies.



Figure 3.1.1 : The losses caused by fraud⁵

To understand what drives people to commit fraud and what are their motivations, Donald Ray Cressey introduced a model called Fraud Triangle Model (Cressey, 1953).

This model tries to identify patterns taking as an example more than 200 cases of fraud. In particular three main elements are identified that are present in most cases and in particular are: personal motivation, opportunity and rationalization.

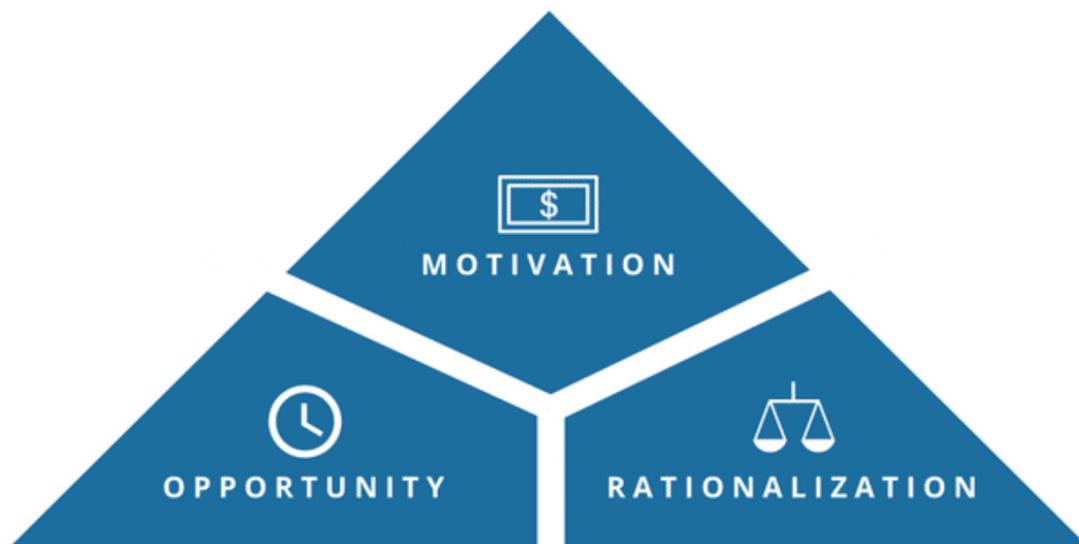


Figure 3.1.2 : The fraud triangle⁶

⁵ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

⁶ from: <https://ebizzing.com/1966-2-fraud-triangle/>

3.1.1 PERSONAL MOTIVATION

Motivation is the beginning of any fraudulent behavior. Each individual has a risk appetite. This means that when for a given subject the fear of consequences becomes less than the possible gain that could be obtained by committing fraud. The risk propensity varies over time and is influenced by the other two factors, opportunity and rationalization.

In particular, Michael Jones (2011) in his book identifies four specific types of motivation: personal incentives, market expectations, special circumstances and cover-up fraud.

- **Personal incentives:** the simplest and most human motivation is the personal incentive. Getting a promotion, a cash bonus or even just getting noticed by one's superiors can drive a person to fraud. As we said in the first chapters, one of the ways to try to reduce the problem of the agency is to link the gratification of the management to the company's results. This, however, can be an incentive to fraud since management will be encouraged to show positive results even if they are not present to obtain the rewards. In some cases, it has also been found that some healthy fraud has been perpetrated solely for prestige and personal satisfaction. It is also interesting to cite a particular case where management can be led to defraud oppositely, therefore not trying to show a rosy situation but the most prudential possible. It happens in fact that some companies after scandals or periods of negative results decide to completely change the management and could happen the so-called "big bath policy". In this case the management that enters has the interest to show the worst possible business situation to be

competent and effective when in the future will succeed to return to a situation of profit.

- **Market expectations:** after personal motivations, we find market-related motivations. Nowadays companies are connected to a global and interconnected market and consequently have relationships with many different stakeholders. This leads companies to have a strong pressure to prove to be profitable and reliable since in the global market they can be easily replaced. In particular, listed companies must publish their results on an ongoing basis to keep their investors informed. Negative results, a lack of dividends, or the failure to meet certain performance targets, even by a small margin, can lead to a sharp fall in the share price. These downturns not only displease investors, who will have less confidence in the management, but also the management itself, which as we have seen before is often compensated with stock options and performance bonuses. Given that consistency and solidity are among the most valued characteristics of stock, the management will have the urge to appear as regular as possible to analysts by resorting to techniques such as "profit smoothing" (i.e. reducing profits in positive years and then recording them in negative years) or simply by creating false accounting entries to cover losses.
- **Special circumstances:** As in the case of the big bath policy, other special circumstances can induce fraud; for example, a bailout or acquisition may lead both the buyer and the acquirer to engage in fraud to raise their value, since the more profitable a company is, the more money they may require for their purchase; this may also happen in the case of stock exchanges where the parties may seek to raise their price to gain on the difference in value. Another very

important special circumstance can be mortgage agreements. It is not uncommon for companies to enter into loan agreements with banks to keep their ratios within certain limits. For this reason, companies may use creative accounting to keep within the established range.

- **Cover Up Fraud:** As we have seen, there are various motivations for perpetrating a fraud. The evidence shows us that when fraud is unmasked, the company has strong image damage, has to pay fines and is forced to operate internal restructuring. For this reason, it may happen that even if the top management learns of a fraud occurring in the company, they may decide to perpetuate a further fraud just to cover the effects generated by the first with the intention of avoiding all the consequences of having to deal with the initial fraud.

3.1.2 OPPORTUNITY

The opportunity must be understood as a set of favorable events and circumstances that can push an individual to fraud. As we have seen before, the fraudster will commit fraud when his utility in defrauding is more than his perception of the consequences. McKendall & Wagner, (1997) argue that in particular, the more fraud increases the higher the belief of the fraudsters that they will not be caught. The factors that influence this perception can be micro or macro factorial; for example, the scarce presence of authority controls, working in certain sectors and the regulatory level are to be considered macro elements while microelements can be the peculiar characteristics of the company, the job, the regulations, punishments and the power relations between the person and his employees or superiors (Aguilera & Vadera, 2008).

3.1.3 RATIONALIZATION

The last element of the triangle is rationalization. Fraudsters often have a psychological need to find a socially acceptable reason to justify the fraud. The search for a justification can occur both before and after the act. As Ashforth & Anand (2003) argue, prospective justifications (i.e., before the act), if identified, serve as a spur to illegal action while retrospective justifications (i.e., after the fraud) are instead used to justify and hide guilt. According to Aguilera & Vadera (2008) the most common rationalization is that of not having caused any direct harm to people and therefore the crime cannot be compared with common crimes such as physical harm. Another excuse often used is that of having performed the act for the good of someone else and not one's own (the company, the family, the industry) to the detriment, however, of the good of a second group. Finally, the most brazen rationalization is ritualism. Fraudsters often justify themselves by pointing to fraud as a common, if not necessary, way of operating in their sector, even if it goes against their own moral principles. For these reasons, it has become a practice for auditors and fraud examiners to analyze the culture and internal dynamics of the companies they examine. If the company climate is strongly result-driven, there is no clear code of ethics and the tone at the top is not respected, the auditor will have to pay more attention, calibrate his controls and set red flags. In addition, in the 2020 survey prepared by the ACFE, it appears that the first indicator and risk element of financial statement fraud is the bad example set by superiors (figure 3.1.2.1).

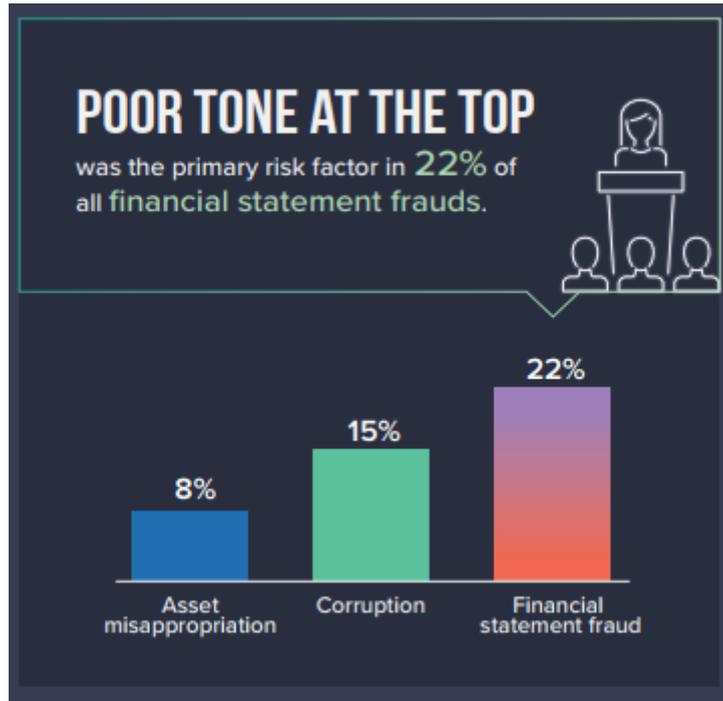


Figure 3.1.2.1 : Importance of tone at the top⁷

To these three elements was added by Schuchter & Levi (2016) a fourth element called skills. In fact, the person's own skills and the position he or she holds can be decisive in the decision to commit fraud.

⁷ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

3.2 THE ACTOR

As we have seen, fraud is a deliberate and rational act. This means that, although the number of frauds using information technology is increasing, it is still a human being who sets the fraud in motion. This means that the perpetrator of the fraud is always one or more people who have the power to influence the company's accounts. This can be an employee, a manager or even, in some cases, someone from outside the company.

When the fraud is committed by a person within the firm who appears to be respectable (see the Ponzi scheme implemented by Maddoff) the fraud can be defined as a white-collar crime. When this type of crime began to spread, it took regulators and legislators by surprise. The law was commonly used to punish violent crimes or harms directly related to individuals, so a new branch of legislation was created to deal with this type of crime,

In parallel with the new legislation, board and management oversight responsibilities have increased, and auditors and internal auditors have been created.

Trade organizations such as the Association of Certified Fraud Examiners (ACFE) or The Association of International Certified Professional Accountants (aicpa) have also been formed to investigate the rationale and patterns of fraud and to outline consistent and efficient strategies and controls.

3.3 RED FLAGS

The term "red flags" refers to indicators that may result from internal or external tests that indicate the possible presence of fraud (Feroz 2008). The presence of a red flag is not sufficient on its own to certify that fraud has been committed, but serves more than anything else to draw the attention of the controllers to a particular event that could be a symptom of fraud.

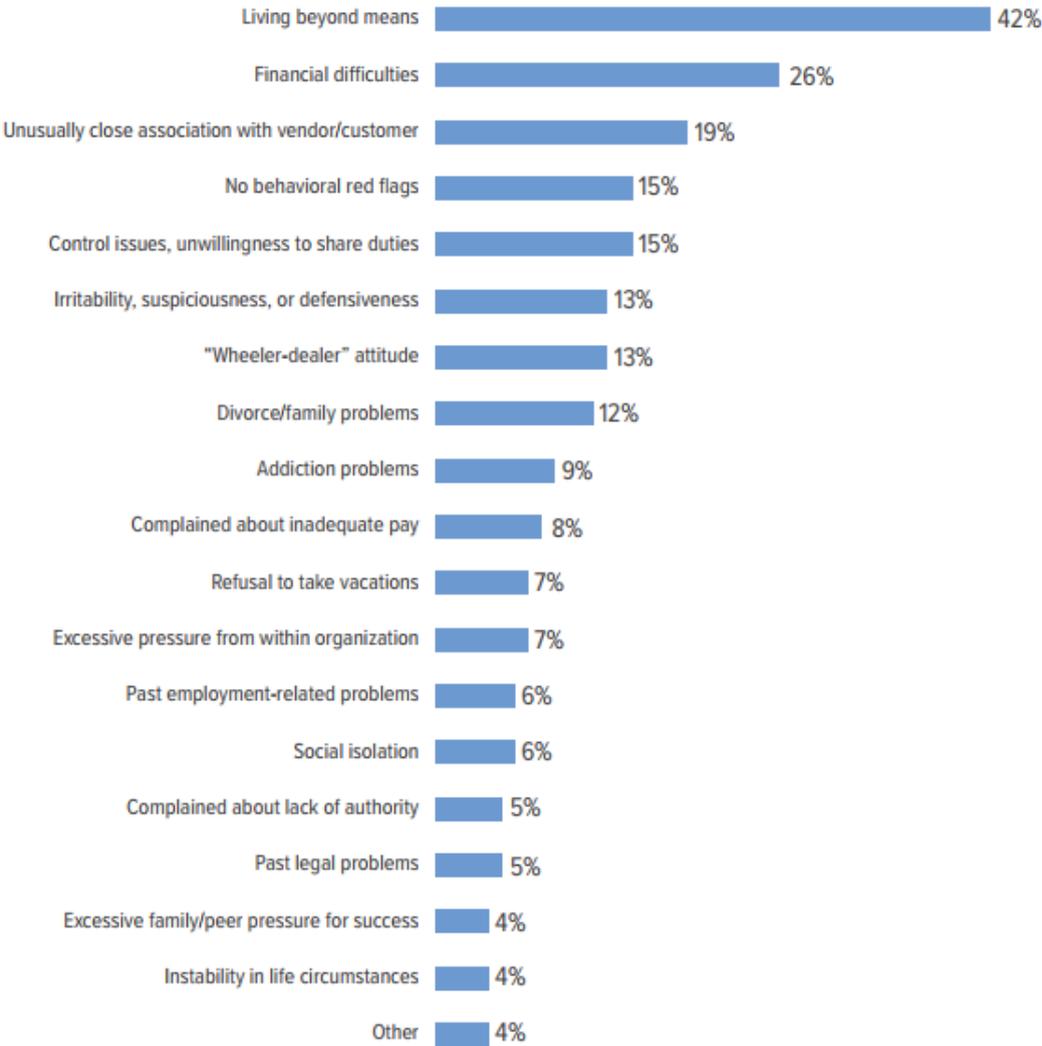


Figure 3.1.2.1 : Most common behavioral red flags⁸

⁸ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

The red flags are linked directly to the fraud triangle seen in the previous chapter. Only by understanding the motivations and drives that can lead to committing fraud we can identify a signal that can be associated with them. The most present red flag and indicative of fraud, as the ACFE indicates in its 2020 report, is living above one's means. We have seen that the desire to earn a lot of money is among the most frequent motivations for fraud. Similarly, the second red flag is exactly the mirror of the first one; being in economic difficulty can be a strong incentive to commit fraud. It is also important to note that since fraud is an illegal action that often clashes with the morals of the fraudster, more and more importance is given to body language and emotions shown by people who could be related to fraud. The fraud examiner, a professional figure created specifically to go and investigate suspected cases of fraud, have among their weapons psychological, investigative and anthropological knowledge to identify red flags related to the behavior of people during interrogation.

3.4 FRAUD TREE

The Association of Certified Fraud Examiners (ACFE) has created the so-called "fraud tree" to provide a clear and structured outline of the various types of fraud.

The Fraud Tree was first introduced in the 1996 ACFE Report to The Nations.

It is called a fraud tree because of its branching form in which it tries to identify and summarize all the main categories and types of corporate fraud.

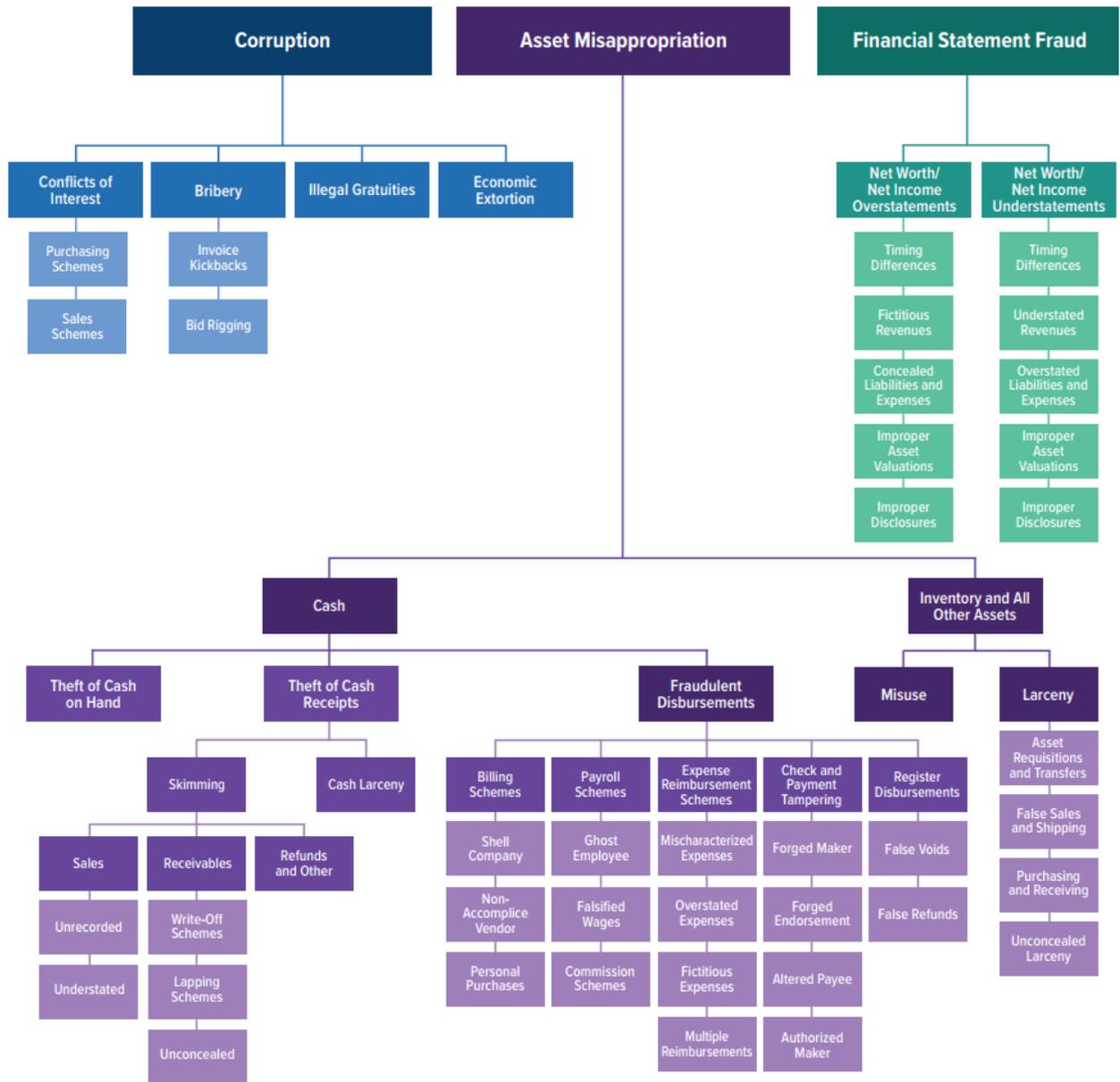


Figure 3.4.1 : Fraud tree⁹

As it can be seen from figure 3.4.1 it is started from three main macro categories of fraud that are corruption, asset misappropriation and financial statement fraud. From these macro-categories we then branch out into the more specific names that have been given to the different types of fraud. Each type of fraud has different characteristics and is influenced by different factors. As a result, the map can be used by fraud examiners to trace the type of fraud that might be perpetrated.

⁹ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

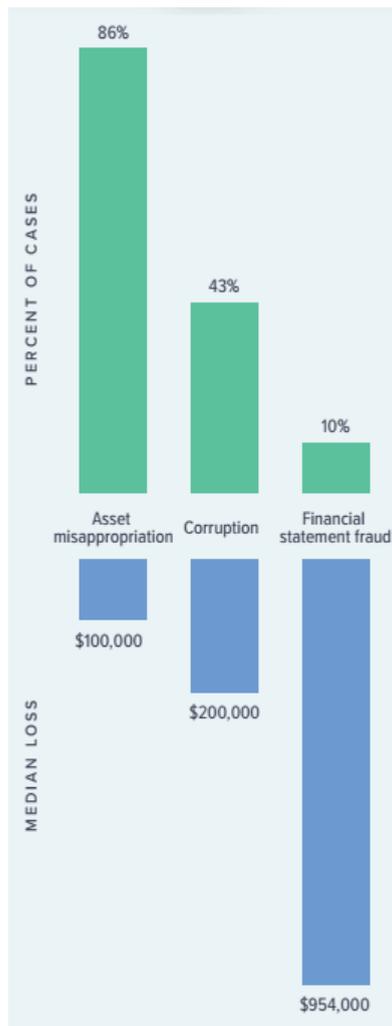


Figure 3.4.2 : Presence and impact of different frauds ¹⁰

The most recent ACFE report (2020) shows that the most widespread type of fraud is asset misappropriation, while the least widespread in percentage terms is financial statement fraud. At the same time, however, it is important to note that the average damage from fraud generated by financial statement fraud is the greatest.

In fact, looking at the following table, retrieved from the report to the nations, we can see that the average monthly loss related to financial statement frauds is much higher than that attributable to other types of frauds.

¹⁰ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

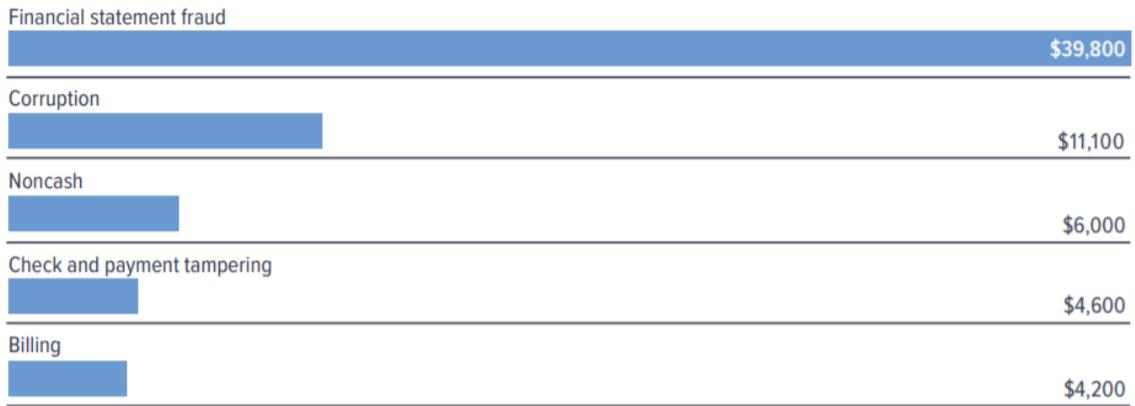


Figure 3.4. : Median loss per month ¹¹

3.4.1 CORRUPTION

Corruption is probably the most archaic topology of fraud and according to the 2020 report also the most common (fig. 3.4.1.1). In fact, situations in which a person exploits their position of power or money to gain an unfair advantage for themselves or their business can be found in all historical periods and in virtually any form of government.



Figure 3.4.1.1 : Corruption frequency ¹²

¹¹ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

¹² from: ACFE - Report to the nations on occupational fraud and abuse; 2020

In particular, the ACFE divides this category into four subgroups:

- **Bribery**, the most common and classic form of corruption in which, in exchange for money or favors, a person decides to break the law in favor of the briber. This type of fraud, now less present in more advanced countries, is still very present in unstable or poorer countries where the rulers have more opportunities to be corrupted without being discovered.
- **Economic extortion**, conceptually similar to bribery but different in the development: in fact in this type is no longer the corrupt to request money to commit the offense but it is the corruptor to force the third party to commit the offense through money and threats.
- **Illegal gratuities**, in this case the corruptor reward decisions favorable to him with gifts and praise to the corrupt to plagiarize even in future decisions.
- **Conflicts of interest**, this last case occurs when the person who has to make a decision will be influenced by the benefits that he/she can receive from the effects that the decision generates by putting his/her interest before the impartial exercise of the task.

3.4.2 ASSET MISAPPROPRIATION

According to the ACFE, asset misappropriation can be understood as all cases in which the fraudster removes goods or money from the organization to obtain a personal profit.

Although asset misappropriation is widespread, it often has a less economic impact on a company (see figure 3.4.2.1). Any person at any

level can secretly take possession of more or less expensive goods objectively causing damage to the company.



Figure 3.4.2.1 : Cost of asset misappropriation ¹³

The fraud tree is generally divided into two categories: Cash and inventories and all other assets.

Among the two, the most common and widespread type is certainly the first, thanks to the availability of money and the relative ease with which it can be hidden and stolen. Among the types of sub-fraud linked to cash, we find in particular :

- **Skimming:** the simplest but at the same time one of the most used methods to embezzle money unduly. Simply during the receipt of money from external parties, the fraudster appropriates part of the cash and then records a lower amount in the accounts.
- **Cash larceny:** Like skimming, cash larceny involves the theft of money, but in this case after the money has already been entered into the accounts. These frauds can be identified during account reconciliations or with external auditors' tests of details.
- **Fraudulent disbursement:** This third category is characterized by expenditures made by the company that do not bring a good or service to the company, but simply the money is intercepted by the

¹³ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

fraudster (who is often also the actor who creates the justification for the expenditure). This type of fraud can be implemented through unjustified expense reimbursements, payments to shell companies, payments to ghost employees or simply by changing amounts and dates on cheques.

The second category is the improper borrowing of assets. This fraud is outright theft aimed at the company's assets, which may be inventory or office assets.

3.4.3 FINANCIAL STATEMENT FRAUD

The last of the three categories identified in the fraud tree are financial statement frauds



Figure 3.4.3.1 : Cost of financial statement fraud ¹⁴

As the ACFE report highlights, although this is the most complex and most knowledge-intensive type of fraud, it is also the one with the greatest impact from the point of view of the losses incurred by the company (figure 3.4.3.1).

As we have seen in the first chapter, governance and, consequently, financial reporting have been set up to bridge the differences in information both to the owners and to the stakeholders. Consequently,

¹⁴ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

this type of fraud becomes very important precisely because it undermines the basic relationship of trust between investors and the company.

The ACFE defines this type of fraud as "a person commits intentional errors or omissions with respect to information contained in an organization's financial statements and financial records"

The objective of the fraudster is to manipulate the accounting records to create a false representation of the company on the part of the shareholders. To carry out such a fraud, the person must have a deep knowledge of the company and personal knowledge of accounting and the dynamics of the stock market.

In particular, the ACFE identifies five main categories of financial statement fraud:

- **Temporal differences:** according to the international accounting standards known as IFRS, income components must be recognized and accounted for based on the related economic event. This is known as the accrual principle, which means that it is not permitted to recognize income components for which the relevant revenues or costs have not been earned or incurred, and it is mandatory to recognize income components for which the relevant revenues or costs have been earned or incurred, even if the financial event has not yet occurred. The fraudster can act contrary to these rules in such a way as to alter the representation shown in the financial statements. Thus, one fraudulent technique may be to charge revenues to the current budget for the following year or, conversely, to defer present costs to the future. This can be done in agreement with the buyer through side agreements. If revenue or cost has to be deferred with accruals to the next period, otherwise the higher revenues and lower costs will affect the result of the period, the

equity and consequently the shares. To track this type of fraud, the various auditing firms have special revenue and expense cut tests and external confirmations from suppliers and customers.

- **Fictitious/overstated revenues:** Unlike time differences, this type of fraud is more complex and requires the actual manipulation of accounting records. In this type of fraud, sales of goods or services that did not take place are accounted for. The person to whom the sale is made may be a real customer or a non-existent person. Because the service is fictitious, the credit balance and consequently the cash flow will never occur. Again, auditors use external confirmations to check that all receivables are genuine. However, the fraudster may be in cahoots with a third party who confirms the credit without actually having it. For this reason, if the claim drags on for several periods, auditors may require aging and perform more in-depth checks on uncollected claims. This type of fraud includes the "big bath strategy" and profit mitigation discussed in previous chapters.
- **Concealed/overstated asset/liabilities:** this category of fraud is very similar to the previous one but linked to liabilities. The schemes included in this third sub-category consist of the concealment or overstatement of liabilities and operating costs, depending on the purpose pursued by the fraudster. At first glance, it may seem strange that a healthy firm would want to hide its positive results by increasing its liabilities. This move, however, may prove beneficial to the company to reduce taxes on earnings. Instead, a technique to be able to reduce expenses to present a better result is to capitalize costs. In fact, for some types of expenses such as development or asset improvement costs, it is possible to capitalize them and then depreciate them over the years, thus spreading the liability over

time. For this reason, auditors carry out strict controls, also with the help of external experts, on whether or not expenses should be capitalized. In fact, due to the complexity reached by accounting standards, it is extremely complex to identify the boundary within which an estimation process remains legal or becomes fraudulent.

- **Improper asset valuation:** This category includes the schemes through which an improper valuation of assets is carried out, resulting in an increase or decrease in assets. It is considered among the most insidious forms of fraud because it is extremely difficult to anticipate and detect. In fact, given the large number of different companies that may operate in different environments, accounting standards have been forced to be unable to give overly precise indications. As a result, companies use a great deal of their energy to assess how they can use the standards in the way that suits them best to achieve their goals. This technique is perfectly legal and for this very reason, it is difficult to distinguish between a company that is implementing an aggressive policy within the limits or one that is using them in an improper and profiteering way. Examples include overstatement of receivables (or lack of impairment), the extension of the useful life of assets and capitalization of costs in the form of research and development or internally generated intangible assets.
- **Improper disclosure:** As we know, shareholders and stakeholders cannot be in constant contact with the company's management. For this reason, laws and regulations impose a certain number of documents that must be published and ratified by shareholders at different intervals. The best known and most widely used are the financial statements with the income statement and balance sheet, the cash flow statement and the notes to the financial statements. These reports are prepared by the management and for this reason,

it is possible that some data may be altered in the drafting, that they may be represented misleadingly or that some events may be omitted. It is the responsibility of the external auditor to ensure that all the minimum data required by law is reported, that it is properly annotated and that it reflects the values that can be derived from the accounts.

4. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

4.1 LITERATURE REVIEW

Fama and Jensen in their 1983 article confront the problem of agency theory. In their conclusions, they confirm that internal control is necessary to mitigate the risk of mismanagement by management. Consequently, they identify the role of the board not only as control of good management but also as mitigation of fraud. Baysinger and Butler (1985), on the other hand, focus in particular on the composition of the board concerning performance. They conclude by showing that there is a link between the presence of a heterogeneous board and better company performance and in particular a positive correlation with the presence of independent directors. This was later also confirmed by Williamson (1984) showing how the knowledge advantage resulting from a non-independent board leads in most cases to more selfish management and to a reduction of the advantages of the shareholders. Subsequently, literature has explored the influence of board characteristics on various factors. For example, Weisbach (1988) has shown that the presence of independent directors leads to a more proactive change of management in case of underperformance, Lee et al. (1992) have shown how a balanced board can make the company more stable, more properly performing and consequently less exposed to a management buyout and finally Brickley and James (1987) confirm that a more diverse and independent board leads to better management compensation.

This focus on board composition and particularly the role of independents led Beasley in 1996 to test how certain board characteristics could correlate with a greater or lesser chance of accounting fraud. In

particular, it has shown that the inclusion of independent members on the board increases the effectiveness of the board's control over fraud and that the composition of the board is more significant than the presence of an audit committee in preventing fraud. That the greater number of independents correlates with the lower presence of fraud was later confirmed by Uzun (2004). It should also be noted that independent directors have an added incentive to be diligent since they do not have a direct connection to the company and will be better valued in the job market (Vafeas 2005). This has led in subsequent years, also following the discovery of some massive frauds in the early 2000s (Enron, Worldcom, Parmalat...) and subsequently in 2008, to an updating of the standards for boards. It has now become mandatory for the boards of listed companies to have a minimum of 50% independent directors and to meet certain professional requirements. However, Avci (2018) showed that despite all other factors being equal, the number of fraud claims did not reduce the number of accounting fraud claims. Therefore, the first hypothesis of this paper will be to go and analyze whether recent frauds, thus committed after the new regulations that were not in place at the time of Beasley, the correlation between a higher percentage of external directors and fraud is still evident and relevant.

Except for studies by Kaplan (2009) who identifies women on boards as more likely to report fraud and Kim (2013) who finds a correlation between compensation on performance and a higher chance of fraud (since compensation on performance makes the director less independent), literature, however, has always concentrated on investigating fraud as a whole without ever going into the specifics of any deeper correlations between specific types of fraud and the characteristics of the board/company. For this reason, the second hypothesis will attempt to identify specific correlations between three distinct types of fraud and firm variables. This can then lead to the identification of red

flags or characteristics with which regulators can refine regulations that are more tailored to specific types of firms.

Farber (2005) has shown that companies in which fraud is discovered, in the years following the fraud, to regain the trust of investors, undertake to modify their board so that it is more heterogeneous and independent. This indicates that companies themselves recognize the independence, professionalism and heterogeneity of the board as a way of signaling to investors that appropriate measures are being taken to mitigate the risk of possible future fraud. The third hypothesis, like the first, will be developed precisely to confirm that, even in the most recent frauds, companies will still react by modifying their board to make it more independent and heterogeneous.

After having analyzed in the two previous macro-areas, first what corporate governance is and its defense systems to prevent fraud and then, the frauds themselves and what drives people to carry them out, we are going to formulate some hypotheses. These hypotheses, which in the following chapters will be investigated through statistical methods, will be used to understand whether particular types of fraud can be linked to specific characteristics of corporate governance, whether Beasley's results are still valid despite the increasingly strict laws and controls of the last two decades, and whether the overlapping position of CEO and Chairman of the board can still create fraudulent correlations.

4.1.1 FIRST HYPOTHESIS

1 We expect non-defrauding companies to have a higher independent directors percentage in respect of executive directors and the position of chairman of the board to be separated from the one of chief executive officer.

As we have seen in the previous chapters, the board of directors is mainly composed of two types of directors: independent directors (who do not have an executive role in the company) and non-independent directors (who instead also cover an executive role).

European Recommendation 15 specifies the role of independents ¹⁵:

“Their role is to supervise executive or managing directors and to deal with situations involving conflicts of interest. It is essential to promote this role to restore confidence in the financial markets. ”

Searching the literature, it emerges that several empirical studies show that boards of directors composed mainly of external directors are more effective in preventing fraud than boards with a majority of non-independent (Brickley and James 1987; Weisbach 1988; Rosenstein and Wyatt 1990)

As a result of these findings, the most important stock exchanges (such as the New York Stock Exchange and the NASDAQ), in order to guarantee the reliability of the markets, are committed to inserting the obligation for listed companies to guarantee poor management of independent directors.

Therefore, given that both the scientific literature and the institutions recognize the task of the independents as fundamental for the control of the executives and, if necessary, act to prevent them from carrying out

¹⁵ EC: Commission Recommendation of 15 February 2005 on the role of non-executive or supervisory directors of listed companies and on the committees of the (supervisory) board (Text with EEA relevance)

too aggressive or dubious policies, we expect to find in the empirical data the confirmation that companies do not defraud (with similar revenues and dimensions in the same state and in the same year so that there are no particular socio-economic influences) there are a greater number of independents.

We also expect to see that, in non-defrauding companies, the role of chairman of the board is more often separated from that of the CEO of the company and that in defrauding companies the chairman is an independent director. While the chairperson is required to retain an objective viewpoint of the affairs of the company, the CEO is often required to become intimately involved in developing and executing management plans. The independence of the chairman is paramount to the successful implementation of good corporate governance practices at board level. To ensure the chairman acts independently, internationally recognized governance codes state that the chairman should not have previously been an executive of the company. The role of the chairman of the board is very influential in the control and decisions of the board itself.

Kesner and Johnson (1990) results suggested that the independence of the board chairman would influence the probability of the firm being sued for fraud.

Jernsen (1993) suggested that boards are ineffectual monitors when the board's equity ownership is small and when the CEO is also Chairman of the Board.

For this reason, we expect that in non-defrauding companies there is a higher probability of finding the two divided positions.

4.1.2 SECOND HYPOTHESIS

In the second hypothesis, we are going to identify specific elements that we expect to see more or less related to a particular type of fraud. This type of correlation has not yet been investigated in the literature. We expect that the results of these correlations will provide greater clarity and support for past findings:

A - Bribery: we expect to see a greater correlation between broader boards and bribery as a type of fraud.

The companies that are most accused of corruption cases are the very large and above all the most internationalized ones. Having many commercial outposts in various countries of the world (some of them in places where the socio-political situation is unstable) increases the probability that an act of corruption will be carried out in one of them. Also in the ACFE report to the nation, there is a greater presence of corruption as a type of fraud in larger companies. (Fig. 4.1.2.1)

In his 2008 article Coles demonstrates how larger and more internationalized companies will be more likely to have larger boards. Furthermore, Baughn (2010) shows that international and large companies are more likely to do bribery especially if they have branches in countries with a stronger culture of bribery or if they are far from the headquarters of the holding.

Consequently, we expect to see a greater correlation between broader boards and bribery as a type of fraud.

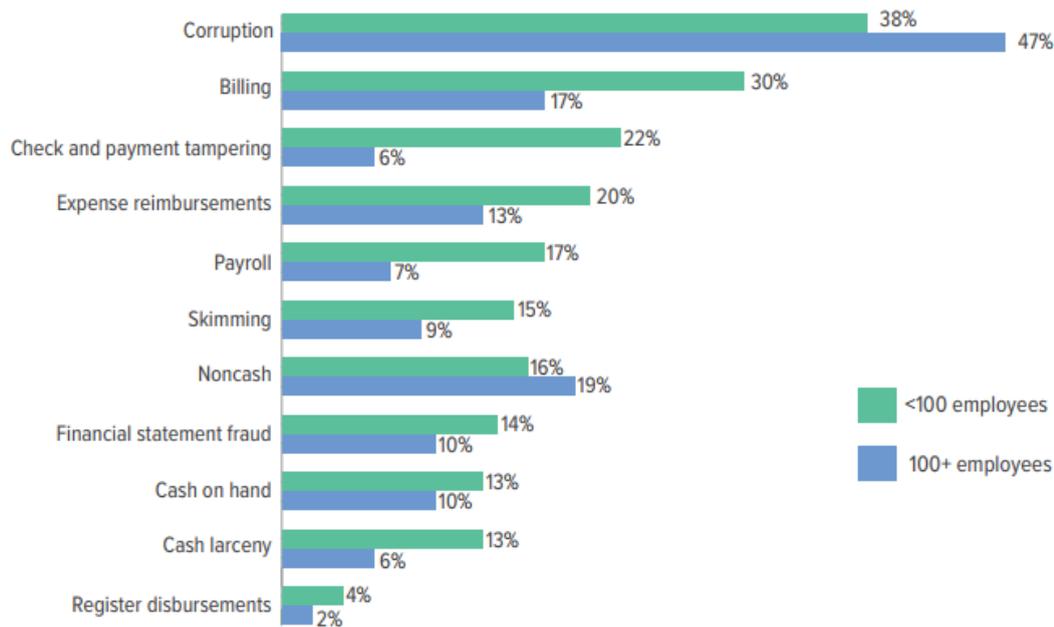


Figure 4.1.2.1 : Presence of different fraud in big and small companies ¹⁶

B - Unaudited documents: *we expect the fraud of unaudited documents related to a smaller ROA index.*

As we have seen in previous chapters, economic and performance difficulties can be a driver for the emergence of fraud. Davidson (2016) shows that ROA in particular correlates with the presence of fraud. Therefore, it can be expected that companies that find themselves in difficulty from the point of view of profitability are less likely to strengthen their internal control system and are hesitant to have the mandatory documents certified. In addition, this would demonstrate that it is not the size or complexity of the company that leads to this type of fraud, but the board, its components and the series of incentives/disincentives linked to them. The positive correlation between fraud and board incentives is identified by Kim (2013).

¹⁶ from: ACFE - Report to the nations on occupational fraud and abuse; 2020

C - Financial statement fraud: *we expect that having the position of ceo and cob united is related to a greater probability of making financial statement fraud.*

In their articles, both Farber (2005) and Jensen (1993) confirmed the correlation between the unification of the positions of chairman of the board and chief executive officer and financial fraud. The double influence that the chairman / CEO, (perhaps also being the founder of the company) manages to exercise in the meeting could lead the other independent directors to be intimidated or less insistent in opposing aggressive policies which can then lead to real infringements of the law.

Furthermore, both Shan (2013) and Chen (2006) found a correlation in Malaysia and China, respectively, between CEO duality and precisely the increased probability of fraud.

Consequently, more than with bribery and unaudited documents, we expect a greater correlation between financial statement fraud and cob coinciding with CEO.

4.1.3 THIRD HYPOTHESIS

For the third hypothesis, *we expect the fraudulent companies, after being discovered, to undertake changes in their board to regain the trust of the market and avoid possible other frauds.*

This hypothesis follows the same proposal of Farber (2005). After 15 years his reasons remain valid: companies, despite the new regulations, continue to have an interest in redeeming themselves in the eyes of the shareholders. The news shows us that after a fraud, companies immediately lay off executives who can be held responsible for the incident. This is to put a first clear patch on the mistake made. In his study Farber demonstrates that this is only a first step (the most

noticeable being the most covered by the press) to immediately show the company's desire for change. The sample of defrauding companies has different characteristics compared to non-defrauding competitors (number of independents, ceo = cob, number of women). Consequently, precisely to pair up with non-defrauding competitors, fraudulent companies will undertake changes in their structure in the years following the fraud. We, therefore, expect that the number of independents will increase, the role of CEO will be divided from COB and the number of members of the audit committee will increase.

4.2 SEARCH FOR SAMPLE DATA

To assess the correctness of the above hypotheses, an empirical analysis will be carried out on a group of American listed companies.

In particular, non-fraud companies with characteristics similar to fraudsters will be identified (according to parameters that will be explained later). With these samples, statistical inferences will be made between the characteristics of the boards of the defrauded and non-defrauding companies to identify any correlations supporting the hypotheses.

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5. SAMPLE SELECTION

5.1 FRAUD SAMPLE

The sample I chose is made by all the companies that were cited in the SEC website¹⁷ under the page Accounting and auditing releases In the period between January 2015 and December 2020. American listed companies were chosen since they are among the largest and most influential in the world, their information is easier to find, and the impact of their fraud is more redundant at the global economy level.

To identify the fraud sample, the companies mentioned in the Accounting and Auditing Enforcement Releases were identified.

The AAER is a public database drawn up by the Sec (Security and exchange commission) the American market control body in which financial reporting related enforcement actions concerning civil lawsuits brought by the Commission in federal court and notices and orders concerning the institution are published and / or settlement of administrative proceedings.

The AAERS were used as a proxy of the founding companies of that period. This technique was also used by Farber (2005), Beasley (1996) and by Bonner (1998).

Obviously the companies cited by the SEC are only a limited sample of all the fraudulent companies. As stated by Feroz et al (1991), the SEC investigates and releases releases only on the most relevant companies given that their fraudulent impact is much more damaging than small-sized companies. However, this can be an advantage from the point

¹⁷ <https://www.sec.gov/divisions/enforce/friactions/.shtml>

of view of our research given that, as Farber (2005) states, the largest and most exposed companies will be the most representative of their sector and will be a proxy for the types of fraud in the same sector.

The period chosen was from 2020 to 2015 as AAERS are often released after years of fraud and recovering data on older cases would have become more difficult. Most of the data was recovered in the period from 2010 to 2020 since companies must keep the documentation for 10 years. In this period most of the releases were not related to fraud but mainly related to actions against CPA. In particular, 581 AAER were issued from January 2015 to December 2020. However, most of them are linked to actions against auditors and accountants and not specifically against defrauding companies (480). 101 cases were then extracted from the total for non-duplicated companies. However, I had to reduce the sample due to other limits dictated by the databases that I had available for searching the data. Furthermore, to carry out the analysis it was necessary to find for each misleading company another with similar characteristics (size; revenues, sector...).

In particular, I discarded the companies listed on OCT link stock exchange due to the difficulty of finding information (15 companies). Then I had to discard all the companies from which I could not find information about governance in the years of fraud (12). Finally, I had to discard companies that did not have a non-defrauding company with similar characteristics, therefore listed on the same stock exchange with a difference between revenues not exceeding 35% (19.)

Sample Selection of 55 Firms Subject to Enforcement Actions between 2015 and 2020	
Number of AAERs issued between 2015 and 2020	581
Less:	
AAERs not involving financial statement fraud, duplicate AAERs, or AAERs outside scope of analysis period (e.g., unintentional misapplication of GAAP, AAERs against auditors)	480
Firms without proxy or financial statement data	27
Firms without an available matching non-fraud firm	19
Final Sample	55

Table 1 : Sample Selection of 55 Firms Subject to Enforcement Actions under SEC between 2015 and 2020

I used the Orbis database to retrieve the data relating to the financial part of the companies revenues indices while I directly used the reports sent to the SEC by the companies for the data relating to the directors' team: forms K 10 and DEF 14A (models in which companies must give an insight into the composition of the board, the various committees and their meetings).

To better identify a year in which it was sure that the fraud was taking place, the central year of the fraud was used and in the case of an even number of years equal to half + 1 year also to have more data available .

In Table 2 you can see how fraud is more and less evenly divided across industries

Two-Digit SIC code	SIC Code Industry Description	Number of firms
10	Metal, Mining	1
13	Oil and Gas Extraction	4
16	Heavy Construction, Except Building	1
20	Food & Kindred Products	2
22	Textile Mill Products	1
28	Chemicals	6
29	Petroleum & Coal Products	1
30	Rubber & Miscellaneous Plastics Products	1
35	Machinery and Computer Equipment	7
36	Electrical	4
37	Transportation Equipment	2
38	Measurement Instruments	2
51	Wholesale Trade - Nondurable Goods	3
56	Apparel and Accessory Stores	1
60	Depository Institutions	3
61	Nondepository Credit Institution	1
62	Security & Commodity Brokers	1
63	Insurance Carriers	1
67	Holding & Other Investment Offices	3
70	Hotels & Other Lodging Places	1
72	Personal Services	1
73	Business Services	8
Total		55

Table 2 : Sample division for two digit SIC code

It is interesting to see that the industries with the highest cases of fraud are those related to innovative sectors, with a strong R&D and services component.

The various releases can be divided according to the violated law and in particular, the three general types that can be found are:

Financial statement fraud:

Violation of Securities Exchange Act of 1934 ("Exchange Act")

"when an issuer makes material misstatements in registration statements, prospectuses or periodic reports filed with the Commission and trading thereafter

occurs in the issuer's securities. The filing of false and misleading reports is a

violation of Section 10(b) of the Exchange Act (of 1934) "

Consequently, the companies included in this category may have been included in the AAERs following material misstatements in registration statements, prospectuses or periodic reports that may have affected the stock market.

Bribery:

Violation of The Foreign Corrupt Practices Act of 1977 ("FCPA")

As stated by the SEC the FCPA: "Was enacted for the purpose of making it unlawful for certain classes of persons and entities to make payments to foreign government officials to assist in obtaining or retaining business. Specifically, the anti-bribery provisions of the FCPA prohibit the willful use of the mails or any means of the instrumentality of interstate commerce corruptly in furtherance of any offer, payment, promise to pay, or authorization of the payment of money or anything of value to any person, while knowing that all or a portion of such money or thing of value will be offered, given or promised, directly or indirectly, to a foreign official to influence the foreign official in his or her official capacity, induce the foreign official to do or omit to do an act in violation of his or her lawful duty or to secure any improper advantage to assist in obtaining or retaining business for or with, or directing business to, any person. " Companies that have violated this regulation; having therefore

made payments to outsiders in exchange for business benefits, they were therefore included in the bribery category.

Unaudit/lack of Internal control:

Violation of the Regulation S-X: form and content of and requirements for financial statements, securities act of 1933, securities exchange act of 1934, investment company act of 1940, investment advisers act of 1940, and energy policy and conservation act of 1975.

Consequently, the companies included in this category may have been included in the AAERs following the presentation of incomplete documentation, lack of adequate internal control according to the regulations in force (Internal Control over Financial Reporting ("ICFR")), having submitted documentation not certified by adequate auditors or not certified.

Type of Fraud	Number of Firms	% of Total
Financial statement fraud	28	50,91%
Bribery	17	30,91%
Unaudited documents	10	18,18%
Total	55	100%
	Median	Std. Deviation
Length of Fraud (in years)	3,58	2,85

Table 3 : Sample division for type of fraud

It is clear that like the financial statement fraud is the more diffuse for the great spectrum of possible frauds. Also, being the more harmful is the one that is more investigated.

5.2 CONTROL SAMPLE

To eliminate the fact that to induce fraud can be elements not inherent to governance but rather to the industry as confirmed by Farber (2005), I used a control sample that would match companies in pairs that were associated with fraudulent companies both in terms of size (revenues) and by sector.

For this reason, as done by Farber (2005) and before him by Beasley (1996), to each element of the sample I associated a control firm that had at least the first two digits of the sic code and with a percentage of revenues that was in a range of 35%

I performed the T test on the averages of the revenues to demonstrate the equality of the sample, I checked that each control company was listed on the same stock exchange and that it operated under the same sic code. This significantly reduced the influences of these elements on the correlations that we will analyze.

Variable	Fraud Firm Mean (in dollars)	Control Firm Mean (in dollars)	t-statistic
Net Sales	5.531.854,95	5.658.299,28	0,9666428

Exchange Listing	Fraud Firm	Control Firm
NASDAQ	31	31
NYSE	24	24
Total	55	55

Table 4-5 : Sample division for stock exchange and t-stat between the two samples

Furthermore, to have two samples as similar as possible, the data of the companies were taken in the same year or, where it was not possible, in the years immediately preceding or following.

A non-defrauding control firm means a company that did not end up in the AEERs for any type of fraud during the investigation period. Furthermore, given that the various stock exchanges have different regulations also relating to certain indications on the composition of the board (for example that they must have 50% or more of independents and the fact that they must necessarily have an audit committee to be listed), the control companies must be in pairs from the same stock exchange as the defrauding ones, in particular, the sample companies come from NASDAQ and New York Stock Exchange.

In this way, the results of the subsequent analyzes are exclusively attributable to the characteristics of the governance model adopted by each company.

Instead, to test the hypothesis that companies change their governance after the fraud to regain market confidence, we took the data of the same fraudulent companies but one year after the fraud.

6. DESCRIPTION OF THE VARIABLES

6.1 DEPENDENT VARIABLE

The fundamental variable for developing the control of the hypotheses formulated is the dependent variable "FRAUD".

This variable is used to define and divide the sample of companies that have been selected. It is called dependent because we expect it to vary as the other variables change.

In this case, the variable is dichotomous, i.e. it can only assume two precise values defined by us, which in particular are:

(1) if the company appeared in the AAER in the 2015-2020 period (therefore considered fraudulent

(0) if the company did NOT appear in the AAER in the 2015-2020 period (therefore considered NON-defrauding)

Considering that to create our sample we used exactly 55 fraudulent and 55 non-defrauding companies, the variable will have value (1) in 50% of cases.

6.2 INDEPENDENT AND CONTROL VARIABLES

Independent variables, on the other hand, are variables that do not depend on other elements and therefore can be used to explain the dependent variable.

Control variables, on the other hand, are variables that are considered to influence the event anyway and which are consequently inserted in the model to reduce any distortions of the result.

However, some of the variables often used in the literature, in this case, will not be used since their effect has already been mitigated by the regulations to which American listed companies must adhere or by the choice of the sample itself. That dimension, that industry and that revenues do not influence the analysis. The variable "presence of an audit committee" or "audits committed with a majority of independents" cannot be used since by regulation the audits commissioned by listed companies must always be present and completely composed of independent directors.

Given that different hypotheses are formulated, some variables will be used in some analyzes as independent, in others as a control to use the collected data most efficiently.

They have been identified below:

1) Number of directors on the board of directors (NCDA)

The variable number of directors on the board represents the total number of directors on the board. Not all studies agree on the influence of the number of directors in fraud. Some like Beasley (1991) say that more directors can lead to a better division of labor and therefore to better fraud control while Lipton (1992) says that the high number of independents is not always a guarantee of good control.

1) One person holds both the Ceo and chairman position (CEO=COB)

The second independent variable intends to verify whether the existence of one

condition of duality for the Chief Executive Officer is linked to an increase

or to a decrease in the risk of accounting fraud.

In this case, the variable is dichotomous, i.e. it can assume only two values:

(1) if the company divides the positions of CEO and chairman of the board

(0) if the company DOES NOT divide the positions of CEO and chairman of the board

Farber (2005) and Beasley (1996) have already shown that there is a correlation between fraud and this type of variable. Centralizing in the hands of a single person both the presidency of the board and the operational management of the company leads to a clear conflict of interest.

2) Number of Audit committee meetings (NAUMIT)

The third independent variable intends to verify whether the percentage of

Independent Directors in the BoD is linked to an increase or to one decrease in the risk of accounting fraud.

Even this variable has already been used by Farber (2005) in his study. It is assumed that a greater number of audit committee meetings may allow for greater control and consequently a lower possibility of fraud.

3) Return on asset index (ROA)

ROA is an index commonly used by financial analysts to assess the health of a company. Indicates the relationship between the result for the year

and the total assets. Consequently, the greater the ROA, the better the situation of the company.

As we have seen in the previous chapters, one of the major drivers that push companies to defraud is the will to cover difficult situations of the company so we expect that a greater ROA is associated with a lower probability of fraud.

4) Percentage of independent directors in the board (%INDCDA)

The third independent variable intends to verify whether the percentage of

Independent Directors in the BoD is linked to an increase or to one decrease in the risk of accounting fraud.

% INDCDA is a continuous variable calculated as the ratio of the number of

Independent Directors and the total number of Directors.

$$\%INDCDA = N^{\circ} \text{ independent directors} / \text{tot directors}$$

We expect, as confirmed by Farber, that a higher independent report on total directors will lead to fewer frauds.

5) Number of independent directors in the board (NINDCDA)

This variable is similar to the previous one but differs given that while% INDCDA looks for a relationship between the employee / independent ratio this is used to identify whether the absolute number of independents is related to the propensity or not to engage in fraud. It is a continuous and numerical variable.

6) Number of audit members (NAUD)

This variable indicates the number of audit members of the audit committee.

It is used to understand if, as we expect, a greater number of audit members leads to better and more widespread control and consequently to fewer frauds. It is a continuous and numerical variable.

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7. DATA

Before starting to do the specific analyzes to answer the hypotheses it is advisable to make an overview on the data collected.

7.1 DIVISION BY FRAUD

From the AAERs 55 fraudulent companies were selected. Of these 51% (28) for accounting fraud, 31% for bribery (17) and 18% (9) for unaudited documents / lack of internal control.

This result is not unexpected as financial statement fraud is a cauldron that contains many subtypes of fraud. There are various and imaginative ways to alter statements. Bribery, on the other hand, is a more specific area of fraud and more difficult to hide, therefore it is understandable that they are less frequent. Finally, understandably, the lack of auditing and internal control is the smallest section because of the three it is the most easily identifiable. It will be easier for the SEC to identify companies that do not audit documents, that do not send them on time and that do not comply with internal control standards. For this reason, it is more difficult for even the companies themselves to make such obvious inattention that they often resolve themselves after a recall without necessarily ending up in the AAER.

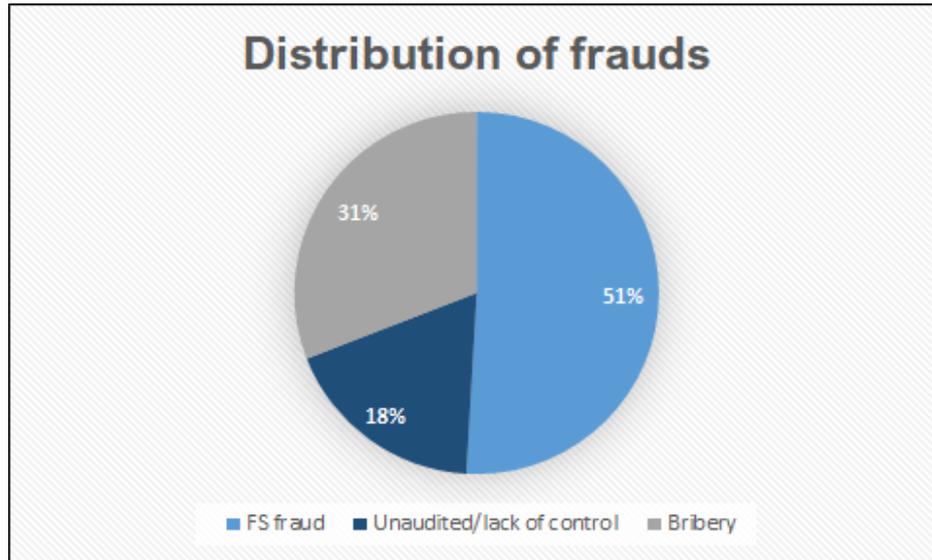


Table 6 : Distribution of frauds in the sample

7.2 IMPACT BY SECTOR

Going instead to see how the type of fraud is distributed in the various sectors we can make some arguments.

Sector	TOT	Brib.	% type fraud/tot. sector fraud	% fraud type/ fraud type tot.	Fs fraud	% type fraud/tot sector fraud	% fraud type/ fraud type tot.	Unau.	% type fraud/tot sector fraud	% fraud type/ fraud type tot.
Mining	5	3	60%	33%	1	20%	8%	1	20%	12%
Construction	1	0	0%	0%	0	0%	0%	1	100%	59%
Manufacturing	26	8	31%	17%	14	54%	22%	4	15%	9%
Wholesale Trade	4	2	50%	27%	2	50%	21%	0	0%	0%
Finance, Insurance and R.E	9	1	11%	6%	5	56%	23%	3	33%	20%
Services	10	3	30%	16%	6	60%	25%	1	0%	0%
TOTAL	55	17			28			10		

Table 7 : Distribution of frauds by sector

The distribution of identified frauds would already seem to give indications on possible correlations. The mining sector and the wholesale trade sector would seem to attract the bribery type more consistently than the other sectors. This could be explained by the fact that mining

areas are often found in unstable and third-world countries, enticing entrepreneurs to perpetuate this type of fraud. For the trade the situation is similar; having to stock and resell from and around the world, they are more likely to encounter opportunities that can entice them to this type of fraud. Financial statement fraud, on the other hand, despite being well distributed in the various sectors, seems to be more present than others in the services sector. This could be explained by the fact that being the tertiary sector and therefore having balance sheets based heavily on intangible assets and value-added, they are more likely to value their assets incorrectly. Little can be said for unaudited documents given the limited size of the sample and the particularity of the type of fraud, but in any case, it would seem to suggest a greater presence in the finance sector.

7.3 IMPACT BY ROA

	Bribery	FS fraud	Unau.
AVG revenues	9.568.141,88	3.230.956,61	5.112.682,50
AVG ROA %	9%	10%	-2%

Table 8: Roa and Revenues by fraud type

On the other hand, looking at the incidence of this type of fraud concerning average revenues and average ROA, it seems that the companies that lack internal control / unaudited documents are those most in difficulty from the point of view of ROA. Consequently, the lack of internal control / an audit could derive precisely from the desire to overlook some items to improve one's situation (see the chapter on motivations).

The companies that do bribery seem to be the ones with the highest revenues. This gives strength to the hypotheses previously formulated on

the fact that it is large and internationalized companies (and consequently with the highest average revenues) that have more opportunities and motivations to do bribery.

Financial statement fraud, on the other hand, is the most general and widespread type that occurs both in smaller companies with lower avg revenues and also in situations of positive ROA.

8. ANALYSIS

In this chapter the analysis on the sample of companies will be carried out to refute or prove the hypotheses formulated in the previous chapters.

Univariate and multivariate analyses were used based on the type of hypothesis.

8.1 UNIVARIATE ANALYSIS

The univariate analysis that we will use on the samples will serve to demonstrate that the averages of the identified variables can be considered statistically different and that consequently, variations have occurred, in the various hypotheses, not random.

For the dichotomous variable CEO = COB we can use the Fisher test (called the exact chi-square test) and the chi-square test.

The tests were carried out in the statistical program R.

To use this type of test, statistics teaches us that we need to first define two starting hypotheses, one called H0 also called the null hypothesis and the second H1 also called the alternative hypothesis. In particular, the two hypotheses will be defined as:

H0) The sample means are not statistically different

H1) The sample means ARE statistically different

Consequently, our goal is to reject the null hypothesis H0 in favor of the alternative hypothesis H1.

For this, we need the p-value that we get from the processing of the R program

The smaller the P-value, the higher the probability that the two averages are statistically different. Consequently, if the p-value returned to us by the program is less than 0.1 then it can be considered that at 90% we can reject H₀ in favor of H₁ and that therefore the difference between the means is significant. If the p-value is greater than 0.1 then it is no longer certain that the differences are significant and therefore it is not prudent to reject H₀ and accept H₁.

8.2 MULTIVARIATE ANALYSIS

The univariate analysis, however, gives us limited information on the particular behavior of the individual variables without, however, explaining and confirming the correlation of the independent variables with the dependent variable. Consequently, I will also use the so-called multivariate analysis which by its construction serves to ascertain the existence of a correlation between the variables.

As I indicated during the description of the variables, the dependent variable on which this research is based is FRAUD. By construction, it is a dichotomous variable where 1 means the presence of fraud and 0 means no presence of fraud. The most suitable regression to study correlations with dichotomous dependent variables is logit regression.

For each variable, R provides an output that includes an estimated coefficient that represents the slope of the line. It represents the effect that the positive variation of a percentage unit of the independent variable has on the dependent variable. Given that if there has been FRAUD fraud it will be 1 if the estimated coefficient is positive it means that the variable increases the risk of fraud while if it is negative it mitigates the risk.

The second element is the standard error, i.e. the error associated with the estimated value that is proposed. The third element is the Z-value. It is the ratio of the estimated coefficient to its standard error. The larger this value is, the more the variable can be considered correlated. Finally, the indicator par excellence remains the p-value. Also in this case, the smaller the p-value, the more likely it is that the correlation between the independent and dependent variable exists. Here, too, the P-value threshold of less than 0.1 (90%) will be used as significance.

8.3 FIRST HYPOTHESIS ANALYSIS

1 We expect non-defrauding companies to have a higher independent directors percentage in respect of executive directors and the position of chairman of the board to be separate from the one of chief executive officer.

To confirm the first hypothesis, let's take the two reference samples for fraudulent and non-fraudulent companies. Of these, we focus in particular on the variables CEO = COB and %INDCDA which are the ones we have to confirm to be different.

As explained before, to confirm the fact that in the two different samples the difference is significant, we use the Fisher test and the chi 2 test for ceo = cob and the t-test and the Wilcoxon test for %INDCDA

		fraud	not fraud	p value Chi ²	p value Fisher test
ceo= cob	yes	23 (41,8%)	32 (58,2%)	2.2e-16	0,000
	no	32 (58,2%)	23 (41,8%)		

		fraud	not fraud	p value T.test	p value Wilcox test
%INDCDA	mean	75%	82%	0,009	0,029
	median	78%	83%		

Table 9: Univariate analysis first hypothesis

In this analysis, it can be seen that in both cases the p values are well below the 90% significance level (P-value <0.1) confirming that the two samples are significantly different from each other. This means that the average percentages accompanying the non-fraud master are higher than those of the fraud sample.

The following logistic regression was used to check the correlation between these two variables and the greater presence of fraud:

$$\text{FRAUD} = \alpha + \beta_1 \times \text{NUMIND} + \beta_2 \times \% \text{INDCDA} + \beta_3 \times \text{NCDA} + \beta_4 \times \text{NAU} + \beta_5 \times \text{ROA} + \beta_6 \times \text{Ceo=Cob} + \varepsilon$$

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	3,03756	1,56804	1,93700	0,05550
NUMIND	0,25983	0,21607	1,20300	0,23190
%INDCDA	-3,53062	2,03925	-1,73100	0,08640 *
NCDA	-0,15825	0,16807	-0,94200	0,34860
NAU	-0,02144	0,07560	-0,28400	0,77730
ROA	-0,00226	0,00153	-1,47900	0,14220
Ceo = Cob	-0,17261	0,09251	-1,86600	0,06490 *

Table 10: Multivariate analysis first hypothesis

From the regression, we can see that both % INDCDA and CEO = COB have a p-value less than 0.1 so they can be considered correlated with the presence of fraud. In particular, given that both estimated values are negative and knowing that fraud is represented by the value 1, we can deduce that both the increase in the percentage of independent directors and the division of the positions of CEO and Chairman are negatively correlated with the presence of fraud. This confirms the first hypothesis and Beasley's results.

8.4 SECOND HYPOTHESIS ANALYSIS

To confirm the three facets of the second hypothesis, let's take the various samples that contrast fraudulent and non-defrauding companies, however, divided by types of fraud to see if particular correlations emerge.

A - Bribery: we expect to see a greater correlation between broader boards and bribery as a type of fraud.

To research the correlation between NCDA and fraud we always use logistic regression:

$$\text{FRAUD} = \alpha + \beta_1 \times \text{NUMIND} + \beta_2 \times \% \text{INDCDA} + \beta_3 \times \text{NCDA} + \beta_4 \times \text{NAU} \\ + \beta_5 \times \text{Ceo=Cob} + \beta_6 \times \text{ROA} + \varepsilon$$

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-2,73250	2,21851	-1,23200	0,21810
NUMIND	-4,65480	3,18700	-1,46100	0,14410
%INDCDA	2,64420	2,59352	1,02000	0,30790
NCDA	4,61860	2,77930	1,66200	0,09660
NAU	-0,37920	0,77710	-0,48800	0,62560
Ceo = Cob	-0,59880	0,90180	-0,66400	0,50670
ROA	0,02200	0,03960	0,55500	0,57860

Table 11: Bribery multivariate analysis

From the regression, we can see that NCDA has a p-value less than 0.1 so it can be considered correlated with the presence of fraud. In this case, the Estimate value is positive. This means that in the bribery sample the number of frauds increases as the number of directors increases. This indicates that, as we have hypothesized, bribery is a phenomenon mainly linked to large companies with large boards.

B - Unaudited documents: *we expect the fraud of unaudited documents related to a smaller ROA index.*

To research the correlation between ROA and fraud we always use logistic regression:

$$\text{FRAUD} = \alpha + \beta_1 \times \text{NUMIND} + \beta_2 \times \% \text{INDCDA} + \beta_3 \times \text{NCDA} + \beta_4 \times \text{NAU} \\ + \beta_5 \times \text{Ceo=Cob} + \beta_6 \times \text{ROA} + \varepsilon$$

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	78,06949	71,37911	1,09400	0,27410
NUMIND	10,30847	9,54680	1,08000	0,28020
%INDCDA	-101,69004	87,54133	-1,16200	0,24540
NCDA	-8,14049	7,89059	-1,03200	0,30220
NAU	0,67199	1,15447	0,58200	0,56050
Ceo = Cob	-0,95115	1,29593	-0,73400	0,46300
ROA	-0,08842	0,05141	-1,72000	0,08540

*

Table 12: Unaudited documents multivariate analysis

From the regression, we can see that ROA has a p-value less than 0.1 so it can be considered correlated with the presence of fraud. In this case, the Estimate value is negative. This means that in the unaudited documents/lack of internal control sample when the ROA has high and positive values, the risk of fraud is reduced.

C - Financial statement fraud: *we expect that having the position of CEO and cob united is related to a greater probability of making financial statement fraud.*

To research the correlation between CEO=COB and fraud we always use logistic regression:

$$\text{FRAUD} = \alpha + \beta_1 \times \text{NUMIND} + \beta_2 \times \% \text{INDCDA} + \beta_3 \times \text{NCDA} + \beta_4 \times \text{NAU} \\ + \beta_5 \times \text{Ceo=Cob} + \beta_6 \times \text{ROA} + \varepsilon$$

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	0,13522	9,89387	0,01400	0,98910
NUMIND	-0,47181	1,40568	-0,33600	0,73710
%INDCDA	-0,50406	1,31117	-0,03800	0,96930
NCDA	0,75631	1,10912	0,68200	0,49530
NAU	-0,65777	0,45260	-1,45300	0,14610
Ceo = Cob	-1,40770	0,65666	-2,14400	0,03210
ROA	-0,00745	0,00724	-1,02900	0,30360

Table 12: Financial statement fraud multivariate analysis

From the regression, we can see that CEO = cob has a p-value less than 0.1 so it can be considered correlated with the presence of fraud. In this case, the Estimate value is negative. This means that in the financial statement fraud sample when the positions of CEO and COB are divided, the number of frauds is reduced. This indicates that as we have hypothesized and as is supported by the literature that the concomitance of these two offices can lead to fraud and that it can increase the likelihood of financial statement fraud in particular.

8.5 THIRD HYPOTHESIS ANALYSIS

We expect the fraudulent companies, after being discovered, to undertake changes in their board to regain the trust of the market and avoid possible other frauds.

To confirm the third hypothesis, let's take the two reference samples "fraudulent companies" and "defrauded companies one year after the fraud termination". Among the variables we can see that in particular, three have a statistically significant variation; in particular on the two variables seen in the first hypothesis (between fraudulent and

non-defrauding companies, therefore% NDCDA and cob = ceo) and the number of meetings held by the audit committee. As explained above, to confirm that in the samples the difference is significant, we use the Fisher test and the Chi-square test for the dichotomous variable COB = CEO while instead, we use the t-test and the Wilcox test for the continuous variables% INDCDA and NAUMIT.

		Bef/fraud	after/fraud	p value Chi ²	p value Fisher test
ceo= cob	yes	23 (41,8%)	31 (56,3%)	2.2e-16	0,00
	no	32 (58,2%)	24 (77,4%)		

		Bef/fraud	after/fraud	p value T.test	p value Wilcox test
%INDCDA	mean	75%	79%	0,06	0,03
	median	78%	83%		
NAUMIT	mean	7,70	10,10	0,01	0,07
	median	7,50	9,00		

Table 13: Third hypothesis univariate analysis

Again we can see that these variables have significantly different means. This not only reinforces the first hypothesis regarding the correlation with fraud but also further confirms Farber's hypothesis on the willingness of companies to remedy their shortcomings after a fraud. To check the actual correlation, logistic regression was performed between before and after the fraud:

$$\begin{aligned}
 \text{FRAUD} = & \alpha + \beta_1 \times \text{NUMIND} + \beta_2 \times \% \text{INDCDA} + \beta_3 \times \text{NCDA} + \beta_4 \times \text{NAU} \\
 & + \beta_5 \times \text{Ceo=Cob} + \beta_6 \times \text{ROA} + \beta_7 \times \text{NAUMIT} + \varepsilon
 \end{aligned}$$

	Estimate	Std. Error	z value	Pr(> t)	
(Intercept)	7,03369	3,78361	1,85900	0,06300	
NUMIND	0,55785	0,46441	1,20100	0,22970	
%INDCDA	-0,08761	0,05235	-1,67400	0,09420	*
NCDA	-0,24941	0,38034	-0,65600	0,51200	
NAU	-0,12645	0,30084	-0,42000	0,67420	
Ceo = Cob	-0,73879	0,42304	-1,74600	0,08070	*
ROA	0,00160	0,00419	0,38100	0,70290	
NAUMIT	-0,11987	0,05324	-2,25200	0,02430	*

Table 14: Third hypothesis multivariate analysis

From the regression we can see that% INDCDA CEO = COB and NAUMIT have a p-value less than 0.1 so they can be considered correlated with the presence of fraud. In these cases, the Estimate value is negative.

This shows that companies have therefore significantly changed the percentage of independents on the board, separated the CEO position from the cob, and increased the number of audit committee meetings during the year.

9. CONCLUSIONS

Using the results obtained from the empirical analysis we can therefore draw some important confirmations and new insights, that will have to be considered in subsequent studies and regulations, in the assessment of the risk of fraud based on the composition of the board.

The analysis of the first hypothesis has confirmed that, even after twenty years in which scandals have followed one another and various new security measures have been taken against the possibility of the presence of corporate fraud, companies that have a board with a lower presence of independents, even following the 50% rule of mandatory independents, have a higher correlation with fraud.

This serves as further evidence that the direction taken by regulators in seeking to impose improvements in the board is correct and indeed, if fraud persists with large global effects, it will be necessary to introduce even more stringent limitations, especially for listed companies.

The second hypothesis showed particular correlations between the type of fraud and certain governance characteristics. We have shown that large and international companies will be more prone to bribery, companies in financial difficulty will have more correlation with the presentation of un-audited documents or lack of documentation, while the division between CEO and COB remains fundamental and correlated with the presence of financial statement frauds. These results, however, also provide a further very important validation. They indirectly confirm that even if they are different types of fraud, the role of the board remains fundamental in the prevention of them. In fact, in all three cases it is confirmed that, regardless of the type of company or the type of fraud, it is the interest of the members of the board to influence mainly the

greater or lesser control. In the case of large boards, it is likely that due to incentives or extensive networks of knowledge there is bribery, in the case of companies in difficulty that the board tries to avoid audits, and in general when the interests of CEO and COB merge it is more likely to be balance sheet fraud.

These correlations can also be a good starting point for more in-depth studies on which precise governance characteristics can be red flags for specific frauds and consequently lead to customization of controls and regulations to be the most fitting for the type of company to be audited.

The third hypothesis, on the other hand, goes to re-confirm the results obtained by Farber (2005). Consequently, it reinforces the results of Beasley (1996) and consequently the first hypothesis regarding the finding that fraud is linked to governance. In addition, it shows that, even today, image and credibility in front of the shareholders remains a fundamental value for companies and that, consequently, even those companies that are aware of what are the most balanced and safe board structures are working to improve their board in the years following the fraud.

We can therefore state that the board and governance were, and remain, fundamental elements to be investigated and evolved to reduce the risk of corporate fraud. In particular, it is important to underline the fundamental role of the independent director who, as has been demonstrated by this and previous research, remains one of the most influential components of governance. It is clear, therefore, that independence leads to making choices that are more rational and, above all, more in line with the wishes of shareholders. We therefore, expect that future studies on this subject will focus more on the correlation between the behavioral and anthropological characteristics of the human components of governance in order to find other possible correlations

and, consequently, possible red flags between the personal characteristics of directors and the possibility of fraud.

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