



OPTIMIZING NON-FINANCIAL DISCLOSURE : INSIGHTS FROM AGENCY AND SIGNALING THEORIES

Fatimazahra KAHIL, Wafae Nada Nejjar

Doctorante en Sciences Economiques et Gestion

Faculté des Sciences Juridiques Economiques et Sociales Ain Sebàà

Université Hassan II – Casablanca –

Professeur de l'enseignement supérieur

Faculté des Sciences Juridiques Economiques et Sociales Ain Sebàà

Université Hassan II – Casablanca –

Digital Object Identifier (DOI): <https://doi.org/10.5281/zenodo.19598868>

Abstract : Optimizing non-financial disclosure can be effectively examined through the complementary frameworks of agency theory and signaling theory, both of which address the challenges associated with information asymmetry in financial markets. In this context, environmental, social, and governance (ESG) disclosure emerges as a key mechanism for improving transparency and reducing potential conflicts between managers and shareholders. From the perspective of agency theory, non-financial reporting enhances accountability by providing relevant information that helps align managerial actions with shareholders' interests. At the same time, signaling theory emphasizes the strategic role of voluntary disclosure in conveying credible and value-relevant information about a firm's performance, quality, and future prospects to external stakeholders. The integration of shareholder and partnership approaches allows for a broader understanding of non-financial communication, extending beyond purely financial considerations to include sustainable relationships with various stakeholders. Within this framework, intangible capital is recognized as a central driver of value creation and competitive advantage. Accordingly, high-quality non-financial disclosure contributes not only to reducing informational gaps but also to strengthening stakeholder trust, enhancing corporate legitimacy, and supporting long-term organizational performance.

Keywords: Non-financial disclosure; ESG; Agency theory; Signaling theory; Transparency; Intangible capital.

1 Introduction

The most relevant theoretical underpinnings for understanding non-financial reporting come partly and implicitly from agency and signal theories. These two major management theories are based on the idea that asymmetric information can disrupt the smooth running of financial markets. On the one hand, agency theory focuses on the contractual relationships between the owners (shareholders) and managers (executives) of a firm, where the latter act on behalf of the former. Information asymmetry occurs when managers have more information about the company's performance and operations than shareholders. This disparity creates a potentially damaging imbalance, as managers may be encouraged to act in their own interests rather than those of shareholders, giving rise to an agency conflict. On the other hand, in the context of signaling theory, companies strive to convey information about their true performance to investors and external stakeholders. They use signals, whether voluntary or involuntary, to communicate data on their financial situation, future prospects, corporate governance and other relevant extra-financial aspects. These signals play a crucial role in managing information asymmetries and building investor and stakeholder confidence in the company. The principles of these theories are based on two distinct approaches: the shareholder approach and the partnership approach.

Indeed, within the framework of the shareholder approach, the essential foundation of agency theory, attention is focused on the traditional relationship between the principal, represented by the shareholder, and the agent, represented by the manager, known as the agency relationship (Charreaux, 2002). A careful, in-depth analysis of this relationship is required to identify the main factors likely to influence non-financial communication. Furthermore, the shareholder approach considers financial and accounting information from two distinct angles: the first being contractual in nature, while the second has a predictive dimension. As far as contractual information is concerned, its aim is to regulate the contracts established with all the entity's stakeholders. Predictive information, on the other hand, enables investors to anticipate and project the company's future. As for the partnership approach, it emphasizes the crucial importance of sustainable investment, particularly in relationships with customers, staff, products, etc. This approach explains why the financial perspective is no longer exclusively linked to a company's financial performance. This approach explains why the financial perspective is no longer exclusively linked to a company's financial performance. At the same time, signal theory also indirectly gives consideration to the disclosure of extra-financial information, while validating its impact on corporate performance. This theory suggests that this supply of information enables managers to signal to the market the quality and performance of their companies relative to those of their peers (Xiao et al. 2004). At this level, we can see that immateriality is a crucial pillar of value generation within organizations. According to Petty & Guthrie (2000), modern companies derive their competitive advantage from their intangible capital, which is indispensable to the creation of products and services. These companies fully recognize that this capital represents a major competitive asset (Tayles et al. 2007).

Furthermore, the conjunction of agency and signal theories offers a valuable conceptual framework for optimizing corporate extra-financial communication, particularly with regard to the disclosure of environmental, social and governance (ESG) performance. While agency theory stresses the importance of transparency and accountability in relations between companies and their stakeholders, signal theory emphasizes the need for clarity and credibility in messages. Together, these two perspectives underline the need for companies to provide relevant and reliable information on their ESG practices and results, in order to build trust and legitimacy with stakeholders. Transparent and accurate communication on these issues not only helps to meet stakeholders' growing expectations in terms of social and environmental responsibility, but also consolidates a company's reputation and long-term market value. This article will be structured around two distinct points. The first point will be dedicated to an in-depth analysis of agency theory, covering its definition, evolution and contributions to the optimization of extra-financial communication. The second section will focus on signal theory. This part of our research will also explore its definition, its conceptual evolution and its implications in the field of extra-financial communication.

2 The impact of agency theory on intangible investment and the quality of non-financial communication:

Agency theory, as a major foundation of economics and management, provides an essential theoretical framework for understanding the complex dynamics governing relationships between different stakeholders within organizations. Developed in the 1970s by economists Michael Jensen and William Meckling, agency theory analyzes the conflicts of interest that emerge within relationships between different economic players, such as company directors and shareholders. Over time, its application has broadened to a variety of contexts, providing valuable insights into issues such as corporate governance, incentive mechanisms, decision-making and contract management, among others. At the heart of agency theory is the concept of delegation of power, where a principal, such as a shareholder or owner, entrusts an agent with the responsibility of performing certain tasks on his or her behalf. However, such delegation often introduces a risk of conflict of interest, as the agent's objectives and motivations may diverge from those of the principal. This situation generates an asymmetry of information, with the agent generally having more detailed knowledge than the principal, which can lead to opportunistic behavior on the part of the agent, to the detriment of the principal's interests. Moreover, in a context where agency theory highlights the conflicts of interest linked to the delegation of power and the asymmetry of information between principal and agent, transparency plays a fundamental role in alleviating these tensions. Today, companies are no longer assessed solely on their tangible assets, but also on their intangible capital and their commitment to social responsibility. In this context, the quality of non-financial communication becomes a crucial lever for guaranteeing transparent and reliable information

to stakeholders, thus reducing the risks of opportunism and strengthening trust between economic players.

The aim of this section is to define the basic concepts and explore the contributions of agency theory to optimizing the quality of non-financial communication and the development of intangible investment.

2.1 Foundations and definitions of agency theory:

In classical economic theory, the firm was often seen as an actor whose sole aim was to maximize profit. This approach neglected the role of its internal organization and assumed that decisions were influenced solely by the market. It also assumed that the company operated in an environment free of uncertainty, where agents were fully aware of demand and costs. However, these assumptions do not reflect reality. This is why agency theory has proposed a new vision of the company, viewing it as a network of contracts, i.e. a set of agreements governing its internal interactions.

▪ Definition:

Agency theory is a fundamental economic concept. It views the firm as a set of contracts between interested parties, requiring management and supervision. Although its main application is in the economic sphere, it also encompasses relationships between two parties where the situation of one depends on the actions of the other. This theory focuses on the study of information asymmetries, as well as divergent interests and motivations between the principal and the agent (acting on behalf of the principal). This relationship naturally manifests itself in employer-employee relations, but also extends to other contexts, such as relations between shareholders and company directors. In addition, it seeks to assess the costs involved in resolving conflicts between principal and agent. According to Jensen and Meckling (1976), an agency relationship is an arrangement whereby one or more persons (the principal) engage another person (the agent) to provide certain services on their behalf, thereby delegating some decision-making authority to the agent. Agency theory is therefore concerned with these relationships and the costs they entail. An agency relationship is characterized by a dynamic between a principal and an agent, where any relationship between two individuals implies that the action of one (the principal) depends on that of the other (the agent). The principal is the person who entrusts others with the power to decide on his or her behalf, while the agent acts on behalf of the principal. The agent, also known as the mandatary, is the person who receives the mandate to act in the interest of the principal. In this context, company executives who supervise and make day-to-day decisions, including strategic ones, act as agents (Zohir, 2012). In addition, this theory aims to analyze ways of improving the effectiveness of cooperation between individuals, with the aim of optimizing collective well-being. The research of Berle and Means (1932) tackles the problem of the gap in interests between shareholders and managers. They argue that agency theory is based on the idea that the firm is made up of a network of contractual relationships. In this context, individuals seek to maximize their utility. And the contracts they enter into generate costs - defined as agency costs - which must be minimized. An agency relationship is defined by two main aspects: on the one hand, information asymmetry, which reflects the fact that the two parties

possess neither complete nor equivalent information; on the other, the risk of moral hazard, which designates the possibility that one of the parties will act contrary to expectations (Bozio and Grene, 1917). The efforts required to ensure that the agent, who has decision-making power, behaves in accordance with the objectives set by the principal, constitute agency costs. These agency costs are of three kinds: the monitoring expenses incurred by the principal to guide the agent's behavior, the costs borne by the agent to signal the proper execution of the mandate, and the so-called “residual” loss, which corresponds to the incompressible gap between the result of the agent's action for the principal and what would have resulted from the principal's effective welfare-maximizing behavior (Gattet, 2020). A common example of an agency relationship is that between a company's shareholders, as “principals”, and its managers, as “agents”. The shareholders, as owners of the capital, entrust the managers with the responsibility of managing the company, in the hope that this management will serve to maximize their interests, such as increasing the value of the shares, as measured by various methods. However, managers, who generally have a better knowledge of the company's situation, also pursue their own objectives. For example, they may seek to maximize their remuneration, and make decisions about resource allocation that do not always correspond to shareholders' expectations, or that have a different time horizon. Thus, Gattet adds that although agency theory is often perceived as a financial theory focused on corporate governance and the relationship between managers and shareholders, its field of application goes far beyond this framework. It also applies to tensions between managers and employees, investors and management companies, franchisors and franchisees, or any cooperative situation where individuals have divergent motivations.

▪ **Origins and foundations of agency theory:**

Agency theory has its roots in the work of various researchers and economists, who have examined the dynamics of delegation and control within organizations. Its beginnings date back to the 18th century, notably with Adam Smith's “Investigation into the Nature and Causes of the Wealth of Nations” (1776), in which he discusses the management of companies by third parties. However, it was not until the 1930s and 1940s that the first formal analyses of agency theory emerged. Economists such as Coase (1937) and Barnard (1938) explored organizational structure, focusing on issues of coordination and control. The term “agency theory” really came into its own in the 1970s, thanks to the research of Jensen and Meckling. Their seminal 1976 article, “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure”, formalized the essential concepts of this theory and greatly contributed to its development. Since then, agency theory has been enriched by the contributions of numerous researchers in the fields of economics, management and finance, and remains an essential reference framework for analyzing agency relationships and governance mechanisms within organizations. However, the separation between the management function and the ownership of capital within a company introduces a multifaceted source of uncertainty. Indeed, managers may not necessarily seek to maximize profits, but rather to pursue other objectives. This is particularly true in companies where capital dilution leads

to the emergence of a managerial power that imposes its decisions on owners/shareholders. This dynamic was first highlighted by Berle and Means in 1932. Generally speaking, the problem of agency, according to agency theory, lies in the divergence of interests between the principal and the agent. Often, the agent has more information about the task in hand than the principal, making the contract between the two parties incomplete and preventing perfect control of the agent by the principal. Each individual seeks to maximize his or her own self-interest, which can lead to behaviors such as non-compliance with contractual commitments or deception.

What's more, individuals, according to their intentional rationality, often prefer to cheat rather than honor a commitment that is unfavorable to them. Alternatively, they may use the contractual freedom granted to them to manage their principal's affairs in a manner unfavorable to the latter. This situation creates an asymmetry of information between principal and agent, where one of the agents has more information than the other about actual conditions. This information asymmetry leads to problems such as anti-selection, where an agent withholds crucial information when signing a contract, and moral hazard, where the agent may not respect his commitments once the contract has been signed. To counter these risks, the principal can resort to measures such as strengthening contracts, introducing penalty clauses or assessing the agent's credibility. Thus, to prevent agent opportunism caused by asymmetric information and incomplete contracts, the principal must put in place an appropriate incentive system and monitoring mechanisms. This approach aims to achieve a satisfactory balance for all parties involved.

This divergence of interests also introduces agency conflicts, which can emerge in various contexts and can be categorized into several types, often depending on the actors involved and the issues at stake. Examples include: divergence of interests, control and supervision, financial risk, dilution of power, etc. Agency conflicts can have significant repercussions on corporate performance and governance. To solve these problems, an incentive system is proposed to align the interests of the agent with those of the principal. This system includes mechanisms such as financial incentives, appraisal bonuses and sanctions, in addition to solutions negotiated between the parties. These mechanisms, stemming from the agency relationship, generate costs, known as agency costs. These include both monetary and non-monetary costs borne by both parties, due to the need to set up a monitoring and control system. At this level, Jensen and Meckling (1976) distinguish three types of costs, which we summarize as follows:

Supervisory expenses: These are costs incurred by the principal to motivate the people he hires and guide the agent's behavior. They may include target-based appraisal systems, financial incentives, productivity bonuses, performance bonuses, ownership participation plans, etc.

Obligation costs: Also known as commitment costs, these represent the expenses that the agent may incur to establish the principal's trust. For example, these costs may arise from the preparation of

financial reports by the company and the performance of audits by experts external to the company. They are essential if the principal is to be confident that the agent will act in his or her best interests.

Opportunity costs: sometimes referred to as “residual loss”, correspond to the loss of utility suffered by the principal as a result of a divergence of interest with the agent. For example, this may be the cost to the principal of management by the agent that runs counter to its own interests. Despite the mechanisms of control and commitment, there is always some divergence between the decisions taken by the agent and those that would maximize the principal's well-being.

These costs make it possible to limit the risks associated with asymmetric information and conflicts of interest inherent in the agency relationship. Their effective management is crucial to improving governance, enhancing transparency and optimizing organizational performance.

2.2 Contribution of agency theory to intangible investment and improved non-financial communication:

Agency theory, based on the work of Jensen and Meckling (1976), is part of the contractual theory of business. It states that the firm is considered as a group of individuals who selfishly seek to maximize their own well-being. Each stakeholder has his or her own interests depending on his or her role within the company. With this in mind, Aamoum and Nakri (2021) assert that the organizational and managerial actions taken by the entity's players take the form of contracts, whether formal or informal, designed to specify the rights and duties of each party. In this way, the company can be seen as a “network of contracts” or agency relationships between the various partners. However, in an environment characterized by significant information asymmetry, these agreements between stakeholders encourage opportunistic behavior and the transfer of wealth for individual ends. Consequently, conflicts of interest arising from the agency relationship, where the shareholder (principal) adopts a passive role of owner while the manager (agent) holds an active management function, influence the degree of transparency regarding the disclosure of intangible assets. Moreover, in their famous 1976 article, Jensen and Meckling showed that any manager who does not own all the shares in his company has an interest in consuming part of the added value for personal gain, given that the costs are borne by all shareholders. Thus, to guide the agent's behavior and maximize his own utility function, Osseonon (2022) states that the principal must put in place incentive and governance mechanisms that generate agency costs. These balancing mechanisms include

information disclosure. The same author adds that the company's objective is to maximize wealth creation for its capital providers. To achieve this, it is necessary to provide information that helps maximize expected cash flows in order to determine share prices and reduce the cost of capital. The absence of relevant information is a handicap to the fair valuation of company shares. Because of this asymmetry of information between management and investors, and the sensitive nature of intangible

assets, it is crucial for companies to practice extra-financial communication. This transparency helps prevent their shares from being undervalued on the market.

This section explores the contribution of agency theory to extra-financial communication and investment in intangible capital, and highlights its role in strengthening corporate transparency and accountability.

Clearly, non-financial communication plays an essential role in the modern business world. It enables companies to communicate their extra-financial impact to external stakeholders. In a context where sustainability and corporate responsibility have become key issues, agency theory offers a relevant conceptual framework for understanding how this communication can be optimized. As a conceptual framework, it also offers a profound analytical approach to understanding the dynamics of intangible investment and the improvement of corporate extra-financial communication. This is an economic model that describes the relationship between the principal and the agent acting on its behalf. This relationship can be marked by conflicts of interest, as shareholders' objectives may diverge from those of management. In this context, non-financial communication plays a crucial role in mitigating these divergences and establishing a relationship of trust between stakeholders, offering valuable insights into how companies make decisions on intangible investment and manage their non-financial communication.

In addition, there are a number of factors that help us to better understand the contribution of agency theory to improving this communication. The most interesting of these are listed below:

Alignment of interests: Agency theory highlights the importance of aligning the interests of stakeholders, notably shareholders and management. In the context of intangible investment, this can mean providing incentives to encourage managers to make decisions that increase the company's long-term value, such as innovation and skills development.

Managing risks and conflicts of interest: Agency theory emphasizes the need to manage the risks and conflicts of interest that may arise between the various players in a company. In terms of intangible investment, this means carefully assessing the benefits and risks associated with each investment decision, and putting in place control mechanisms to minimize opportunistic behavior.

Corporate governance: Agency theory emphasizes the importance of effective corporate governance to ensure responsible and transparent decision-making. In the field of non-financial reporting, this means that companies must provide reliable and relevant information to external stakeholders, such as investors and regulators, to maintain trust and credibility.

Transparency and responsibility: Agency theory emphasizes the importance of transparency and responsibility in non-financial communication. Companies are encouraged to disclose their activities, performance and social and environmental impacts transparently, so that stakeholders can properly assess their performance and make informed decisions.

Control and oversight: A crucial aspect of agency theory is the need for adequate control and oversight to mitigate agency risks and ensure management accountability. In the context of intangible investment, this may involve setting up monitoring mechanisms to assess the effectiveness of investments and ensure that they are aligned with the company's strategic objectives.

Corporate structure: Agency theory highlights the impact of corporate structure on investment decisions and communication. For example, in companies where ownership is separated from management, executives may be encouraged to pursue long-term intangible investments to maximize shareholder value.

It can be seen that agency theory represents a fundamental paradigm in corporate governance theory, offering an analytical framework for understanding the relational dynamics between shareholders and managers. In the context of intangible investment and extra-financial communication, this theory offers valuable insights into how management choices and communication strategies affect the creation of sustainable shareholder value. By focusing on alignment of interests, monitoring, incentives and corporate governance, agency theory sheds light on how companies should invest in intangible assets while ensuring transparent and accountable management and communication. It also underlines the crucial importance of high-quality extra-financial communication in enabling stakeholders to assess a company's performance in managing intangible assets and its consideration of social, environmental and governance issues. Thus, by integrating agency principles into the analysis of intangible investment and extra-financial communication, researchers and practitioners can better understand the mechanisms underlying value creation in contemporary companies, while proposing recommendations for more effective and transparent corporate governance.

3 The contribution of signal theory to improving the quality of non-financial communication:

Signal theory is a relevant conceptual framework with a wide range of applications, notably in economics, finance and communication. Developed from the 1970s onwards by eminent figures such as Michael Spence and David Blackwell, this theory makes a significant contribution by shedding light on the processes of transmitting, interpreting and using information in environments characterized by information asymmetries between economic agents. At the heart of this theory lies the notion that individuals seek to transmit relevant information through various signals, with the aim of influencing the behavior of other agents. This dynamic often unfolds in environments where certain players possess privileged knowledge or specific information to which others do not have access. Consequently, signal theory explores how individuals use a diverse range of signals - such as diplomas, certifications, performance indices or observable behaviors - to communicate information about their hidden characteristics, such as their skills, credibility or intentions. In today's context, where intangible capital and extra-financial communication play a key role in the evaluation of companies, this theory is of particular importance. It sheds light on how companies deploy signals to communicate information

about their intangible capital, thereby strengthening their reputation, perceived performance and commitment to social responsibility.

The role of this section is to analyze the contributions of signal theory to the quality of non-financial communication in the light of the development of intangible investment.

3.1 Conceptualization and evolution of signal theory:

Signal theory represents a set of mathematical techniques aimed at describing, classifying and optimizing the use of signals (Juttin, 2018). This relatively recent discipline was largely developed after the Second World War to meet growing demands and needs, particularly in the fields of telecommunications, radar, sonar and the perception of our environment. Before proceeding to analyze the contributions of signal theory to our research problem, a review of the concepts and historical development will be essential.

- **Definition:**

The words signal and information are common in everyday language. In the scientific world, however, these words have very specific meanings: in particular, information theory, signal theory and signal processing correspond to different concepts, illustrated in the figure below in the context of a communications chain.

Furthermore, “the concept of signal is vast and applies to a variety of fields. According to Benyoucef (2016), in physics, it refers to any measurable quantity that varies as a function of other parameters such as space, time, temperature or illumination. In other words, a signal physically represents information, which it carries from its source to its recipient. Signal theory aims to describe these phenomena mathematically. Its aim is to provide the tools to analyze, design and characterize information processing systems. Usually, a signal can be described by a function involving one or more variables, although this representation is not always reducible to a concise mathematical expression. In economics, a signal is a piece of information that guides its recipient in making a decision. In economics, signal theory plays a crucial role in shedding light on economic interactions, by examining the origin and credibility of signals. This theory is based on the idea that individuals seek to communicate signals in order to reveal their private information and influence the behavior of other economic players. It enables us to analyze the mechanisms by which economic agents exchange information in situations where there is asymmetry of information. Signal theory also assumes that information is not universally shared at the same time, creating an asymmetry of information that can have adverse effects, such as inaccurate valuations or a sub-optimal investment strategy. To counter this asymmetry, certain financial decisions are taken to transmit a signal, which means that they must generate financially unfavorable consequences for the initiator if the signal proves to be incorrect.

In addition, signal theory, as defined in the Dictionary of Accounting and Financial Management (2006), is based on the principle of asymmetric information between company managers and investors, whether shareholders or savers, on the financial markets. According to this theory, managers use signals to

persuade the markets of their company's distinctive strengths. It seeks to assess the relevance of the information conveyed by these signals, and to understand the motivations that drive managers to voluntarily share certain information or, on the contrary, to keep it confidential. In addition, signal theory analyzes the incentive mechanisms that encourage high-performing managers to transmit genuine signals, while discouraging managers of less successful companies from using these same signals to conceal their company's true situation. According to this theory, holders of privileged information should adopt a policy of voluntary disclosure to avoid misinterpretation by external parties (Verrechia, 1990).

▪ **Dynamic evolution of signal theory :**

Spence (1974) fut le premier à aborder ce problème de manière méthodique. En 1977, il identifie quatre catégories de signaux : ceux relatifs à la structure du capital, ceux en lien avec les dividendes, ceux concernant les opérations financières sur les actions de l'entreprise (comme les introductions en bourse ou les réductions de la valeur nominale des actions), ainsi que les signaux liés aux actifs de l'entreprise (tels que la réévaluation des actifs existants ou l'acquisition de nouveaux actifs). L'ensemble de ces signaux peut être véhiculé à travers la communication financière (Nejjar, 2011).

Moreover, in the context of non-financial communication, the signals of signal theory are proving to be powerful levers, as they are fundamental tools in the transmission and reception of information. This form of communication, which revolves around a company's social, environmental and governance aspects, requires precise mechanisms to convey key messages. Signal theory fulfils this function, enabling companies to share their commitments, performance and values in these key areas. These signals take many forms, from sustainability reports to environmental certifications to corporate social responsibility initiatives. By using these signals, companies can build strong links with their stakeholders, strengthen their reputation, and demonstrate their commitment to a sustainable and ethical business model. Thus, signal theory signals are a central element in extra-financial communication, facilitating the building of transparent and mutually beneficial relationships between companies and their ecosystem. Signal theory signals in extra-financial communication are not limited to social, environmental and governance aspects alone, but also encompass a company's intangible capital. This capital, including brand reputation, innovation, knowledge and staff skills, is crucial in assessing an organization's long-term value. As part of extra-financial communication, companies can use signals such as talent development programs, patents filed, innovation awards, strategic partnerships, or employee satisfaction and commitment indicators to highlight their intangible capital. By integrating these signals into their communications, companies demonstrate their ability to create value beyond the purely financial aspects, thereby reinforcing their attractiveness to investors, customers and talent. As a result, intangible capital signals effectively complement extra-financial communication by providing a holistic perspective on a company's health and sustainability. Most of the research already done on signal theory claims that it was put into practice in 1970 by Akerlof, a statement that is not entirely correct. In

fact, George Akerlof was one of the pioneers in the field of information economics, particularly with regard to the concept of information asymmetry. On that date, George Akerlof published a groundbreaking article entitled “The Market for Lemons: Quality Uncertainty and the Market Mechanism” in the Quarterly Journal of Economics. This article laid the foundations for the theory of asymmetric information and had a significant impact on the field of economics. In the same article, Akerlof examined the used car market in the USA and showed how asymmetric information between sellers (car owners) and buyers (consumers) could lead to undesirable outcomes. He introduced the concept of “adverse selection”, which occurs when sellers with superior knowledge of actual product quality have an incentive to sell inferior products in a market where buyers cannot easily distinguish between high and low quality products. Akerlof's paper paved the way for much subsequent research into problems of asymmetric information, and significantly influenced the development of signal theory in economics. Although signal theory is not directly attributable to Akerlof, his work has greatly contributed to illuminating the fundamental concepts underlying this theory. Following George Akerlof's work, Michael Spence published an article in 1973 entitled “Job Market Signaling”, in which he developed a theory of signaling in the context of the labor market. Spence showed how individuals can choose to acquire diplomas or undergo costly training to signal their quality to potential employers. This theory has important implications for labor training and wages. Also in 1973, Joseph Stiglitz contributed to information theory by studying the consequences of asymmetric information in financial markets. He showed how financial markets can be affected by the private information of economic agents, leading to inefficiencies and undesirable outcomes (Löfgren et al. 2002). In 1975, Michael Spence and Kenneth Arrow published a joint paper on the role of signaling in medical insurance. They examined how healthcare providers and patients can use signals to communicate information about quality of care, which can influence insurance coverage decisions. Jean Tirole's work, notably in his book “The Theory of Corporate Finance”, has deepened the understanding of information asymmetry issues in corporate finance. He analyzed how companies can use various mechanisms, such as capital structure and corporate governance, to manage problems of asymmetric information between managers and shareholders. Since then, signal theory has been applied to many other fields, such as health economics, education, contracts, advertising and so on. Economists continue to develop and refine signaling concepts to better understand complex economic phenomena in a world where information is often imperfect and asymmetric.

3.2 The essence of Signal Theory in intangible investment and the quality of extra-financial communication:

Recognition of the growing importance of intangible assets in the economy dates back to the 1980s. Initially, economists focused on describing these assets (Caspar and Afriat 1988), and even on their aggregate quantification (Kaplan and Burcklen 1986). Subsequently, practitioners and theoreticians of

business management have also given thought to their identification and definition, as well as to the integration of these assets into information systems (Martory et al. 1993). This awareness is all the more important in view of two major trends: on the one hand, the growing importance of service activities in developed economies, and on the other, the gradual dematerialization of physical processes. The emergence of the intellectual component in production and trade, as well as the growing outsourcing observed within many organizations, which rely on complex networks of external service providers, illustrate these transformations. Some authors, such as Montcel Henri (1994), Bond and Commins (2000) and Brynjolfsson et al. (2000), even refer to this evolution as the transition to the “New Economy”. In this context, whereas in the traditional economy the value of companies rested mainly on their tangible assets such as infrastructure and equipment, the New Economy derives a considerable part of its value from intangible assets, such as human capital, intellectual property, brand reputation and competitive position.

According to Blair and Wallman (2000), who lead the Brookings Institution's Intangible Assets Research Project, less than half of the market value of corporate capital consists of physical assets such as chattels, machinery and buildings. The remainder comes from human and organizational capital, comprising elements such as ideas, information, patents, copyrights, reputation and market dominance. However, two observations prompted researchers to seek an explanation for these phenomena. Firstly, it appeared that the need for intangible investment varies from one industrial sector to another. Secondly, it became clear that financial markets are attributing increasing importance to intangible investments. To explain this development, several distinct theories have emerged, including the signaling theory, which emphasizes that these investments play a key role as indicators for financial players. Indeed, a company with valuable intangible capital sends a positive signal to the markets, increasing its perceived value. Conversely, a company whose intangible investment generates neither wealth nor value will send no such signal. From the point of view of corporate strategy and management, it is particularly interesting to note that intangible capital now occupies a central place in the valuation of organizations (Brooking, 1996). In the same vein, financial analysts surveyed by the Société Française des Analystes Financiers in April 2000, as well as European business leaders consulted by Mazars Guérard, agree on the strategic importance of intangible issues. Griliches (1981) confirms that American studies show a correlation between companies' sustainability and financial ratings, and their valuation on the financial markets, notably through the use of Tobin's ratio.

According to this theory, and others to be discussed later, companies that have succeeded in converting their intangible investments into know-how should be those whose financial markets have placed a higher value on intangible assets. This type of company is likely to belong mainly to the high-tech sector. On the other hand, companies operating in traditional sectors, where the need for investment in intangible assets is low, or even very low, are unlikely to see their intangible assets grow significantly,

or be valued significantly by the financial market. The accelerating transformation of information and communication technologies significantly reinforces the importance of intangible investments in today's economy. Research by Thibierge (2001), Ding & Stolowy (2003), and Alcouffe & Louzzani (2003) highlights the strategic importance of these investments, often linked to issues of confidentiality and secrecy. To maintain their competitiveness in an ever-changing global market, companies invest massively in intangible assets such as software, databases, brands and patents. These investments not only improve companies' productivity and efficiency, but also constitute a significant part of their overall value. Thus, a rigorous valuation of these assets becomes crucial for investors, financial analysts and other stakeholders, as it directly influences the investment choices and strategic orientations of companies. Consequently, accurate valuation of these intangible assets is becoming essential for investors, financial analysts and stakeholders, directly influencing investment decisions and corporate strategy. In this context, where information held by management is not fully accessible to external investors, the latter face challenges in accurately assessing the profitability prospects of companies. Signal theory thus offers a powerful analytical framework for understanding and assessing the impact of intangible investments on the financial performance and value of companies, thus promoting more efficient capital allocation and more informed investment decision-making.

The significant impact of signal theory on the development of intangible investment, and the improvement in the quality of information on this investment, can be summarized as follows:

Financial data processing: Signal processing techniques are used to analyze financial data in real time, enabling a more accurate assessment of the performance of intangible assets such as brand reputation, patents, technologies, etc.

Modeling intangible assets: Signal theory provides tools for modeling and quantifying intangible assets, enabling investors to better understand their value and potential contribution to a company's financial performance.

Detecting trends and anomalies: Signal processing techniques can detect trends and anomalies in financial data, helping investors to identify investment opportunities and risks associated with intangible assets.

Risk management: By providing a more in-depth analysis of financial data, signal theory helps to better assess and manage the risks associated with intangible investments, contributing to more informed decision-making.

Improved transparency and quality of information: By integrating signal processing techniques into financial analysis, companies can provide more accurate and transparent information on their intangible assets, improving the quality of information available to investors.

Identifying market signals: This helps identify relevant market signals linked to intangible investments, such as changes in consumer preferences, technological developments or regulatory trends, enabling investors to make more informed decisions.

Competitive monitoring: This monitors signals from competitors, such as new product announcements or changes in marketing strategies, which can help investors assess the competitive position of companies and anticipate market movements.

Adaptation to market changes: By rapidly detecting signals of change in the financial markets, signal theory enables investors to adapt quickly to new market conditions and make more agile, responsive investment decisions.

Optimizing investment strategies: By using models based on signal theory, investors can develop more sophisticated investment strategies that take intangible assets into account and optimize financial returns.

Combining these aspects with those mentioned above, we can see that Signal Theory has had a profound impact on the development of intangible investment and the improvement of the quality of the information surrounding it in a variety of ways. It has become an essential tool for investors and companies seeking to maximize the value of their intangible investments and make more informed investment decisions in a constantly evolving financial environment.

Signal theory is a fundamental pillar in the valuation, management and understanding of intangible investments. Thanks to its advanced analytical tools, it enables investors and companies to apprehend more accurately the value and potential of intangible assets such as intellectual property, brand reputation and human capital. Moreover, by improving the quality of information available on these investments, it promotes more informed decision-making and more effective investment strategies. In an ever-changing economic context, where intangible investments are playing an increasingly important role, signal theory is proving to be an invaluable asset for maximizing the value and profitability of investment portfolios and companies. By integrating the principles of signal theory into their analysis and management, market players can better anticipate trends, identify opportunities and manage risks, thereby contributing to more sustainable and prosperous development of the global economy. In short, the quality of non-financial communication can be seen as a crucial vector for transmitting credible signals on a company's value and governance, thereby influencing the perceptions of investors and stakeholders.

4 Conclusion

Combining the contributions of agency theory and signal theory provides an in-depth understanding of how corporate extra-financial communication contributes to transparency and stakeholder relationship management. By highlighting the information asymmetry that exists between shareholders and management, agency theory reveals the tensions and potential conflicts of interest that can undermine the transparency and effectiveness of corporate decision-making. This asymmetry creates fertile ground for opportunistic behavior on the part of managers, who may prioritize their own interests to the detriment of those of shareholders and other stakeholders. Effective governance mechanisms, notably through the disclosure of non-financial information, are therefore essential to restore trust, align the objectives of the various parties and reduce the risk of opportunism.

In this dynamic, signal theory sheds further light on how companies, aware of their informational advantage, can use extra-financial communication as a strategic tool to signal their commitment to sustainable and responsible practices. By disclosing information on their social, environmental and governance performance, companies send signals to investors and other stakeholders, affirming their commitment to long-term objectives. These signals play a key role in reducing uncertainty and the risk of undervaluing corporate intangible assets, which are often misunderstood or overlooked by the market. Thus, the integration of the two theories provides a more comprehensive understanding of how extra-financial communication can address the need to mitigate the tensions associated with information asymmetry and divergent interests, while serving as a strategic tool for enhancing corporate reputation and attracting responsible investors. Indeed, clear, consistent and sincere non-financial communication can not only improve transparency and stakeholder confidence, but also offer a competitive advantage to companies that succeed in proactively managing their social and environmental impacts. Far from being a mere regulatory imperative, transparency is becoming an essential strategic lever in a world where stakeholders' expectations in terms of responsibility and sustainable development are constantly rising.

REFERENCES

- [1] Charreaux, G. (2002), « Gouvernance d'entreprise, création de valeur et performances », In *Finance Contrôle Stratégie*, 5(2), 57-88.
- [2] Petty, R. & Guthrie, J. (2000), « Intellectual capital literature review: Measurement, reporting and management », In *Journal of Intellectual Capital*, 1(2), 155-176
- [3] Xiao, J. Yang, H. & Chow, C. (2004), « The determinants and caractéristiques of voluntary Internet-based disclosures by listed Chinese companies ». *Journal of Accounting and Public Policy*.23, 191-225.
- [4] Tayles, M. Pike, R. H. and Sofian, S. (2007), « Intellectual capital, management accounting practices and corporate performance: perceptions of managers. *Account. Audit. Account. J.* 20, 522–548.
- [5] Jutten, C. (2018), « Théorie du signal », Département Informatique et Electronique des Systèmes Embarqués, IESE4, Univ. Grenoble Alpes - Polytech' Grenoble.
- [6] Benyoucef, D. (2016), « Théorie du signal », Cours Théorie du signal : Généralités sur les signaux, https://www.researchgate.net/publication/292994001_Cours_Theorie_du_signal_Generalites_sur_les_signaux/citation/download
- [7] Institut Canadien des Comptables Agréés, (2006), Dictionnaire de la comptabilité et de la gestion financière, version 1.2.
- [8] Verrechia, R. (1990), “information quality and discretionary disclosure”, *Journal of Accounting and Economics*, N°12, pp.365-380.
- [9] Spence, M. (1974). *Market Signaling: Informational Transfer in Hiring and Related Screening Processes*. Cambridge, MA : Harvard University Press. (Réédition : 2002).
- [10] Nejjar, W.N. (2011), « Contribution à l'analyse des mécanismes de gouvernance explicatifs de la qualité de la communication financière: cas des entreprises du SBF 120 », *Gestion et management*. Université d'Orléans, Ecole Doctorale Sciences de l'Homme et de la Société, Lboratoire Orleanais de Gestion.
- [11] Akerlof, G. (1978), « The Market for Lemons: Quality Uncertainty and the Market Mechanism », *Uncertainty in Economics, Readings and Exercises*, Edited by: Diamond, P. et Rothschild, M.
- [12] Akerlof, G. A., & Spence, M. (1973), « Job Market Signaling », In *The Quarterly Journal of Economics*, 87(3), 355-374.
- [13] Stiglitz, J. E. (1973), « The Theory of Screening, Education, and the Distribution of Income », In *The American Economic Review*, 65(3), 283-300.
- [14] Löfgren, K. Persson, T. et Weibull, J. (2002), « Markets with Asymmetric Information: The Contributions of George Akerlof, Michael Spence and Joseph Stiglitz », *The Scandinavian Journal of Economics*, Vol. 104, No. 2 (Jun.), pp. 195-211.

- [15] Arrow, K. J., & Spence, M. (1975), « The Economics of Information and Knowledge. In G. A. Bell, S. Marris, & D. Vines (Eds.), *Economic Analysis and the Multinational Enterprise* (pp. 177-194). London: Routledge
- [16] Caspar, P. et Afriat, C. (1988), « L'investissement intellectuel », Paris, *Economica*, p. 40-50
- [17] Kaplan, M.K. et Burcklen J.P. (1986), " La Montée de l'investissement intellectuel", *Futuribles*, n° 101, p. 50.
- [18] Montcel Henri, T. (1994), "L'avenir appartient à l'immatériel dans l'entreprise", *Revue Française de Gestion*, Septembre-Octobre, pp. 97-101
- [19] Bond, S.R. et Commins, J.G. (2000), « The Stock Market and Investment in the New Economy: Some Tangible Facts and Intangible Fictions », *Brookings Papers on Economic Activity*, Issue 1, pp. 61-70.
- [20] Brynjolfsson, E. Hitt, L. et Yang, S. (2000), « Intangible assets: How the interaction of information technology and organizational structure affects stock market valuations », Working paper, MIT, URL: <http://ebusiness.mit.edu/erik/itqo%20final-7-00.pdf>
- [21] Blair, M.M. et Wallman, S.M.H. (2000), « Unseen Wealth: Report of the Brookings task force on understanding intangibles sources of value », The Brookings institution, Washington.
- [22] Brooking, A. (1996), « Intellectual Capital: Core Assets for the Millennium Enterprise », International Thomson Business.
- [23] Griliches, Z. (1981), "Market value, R&D and patents", *Economics Letters*, Mars, pp. 183-187.
- [24] Thibierge, C. (2001), « Actifs immatériels, valorisation boursière et contrainte d'endettement : étude empirique sur les marchés français et espagnol », Département Finance, ESCP-EAP, Mars.
- [25] Ding, Y. et Stolowy, H. (2003), « Les facteurs déterminants de la stratégie des groupes français en matière de communication sur les activités de R&D », *Finance Contrôle Stratégie*, vol.6, N°1, Mars, pp.39-62
- [26] Alcouffe, C. et Louzzani, Y. (2003), « Mesure de l'investissement immatériel : indicateurs d'évaluation et de performance », Les notes du LIRHE, N° 381, Juin.
- [27] Jensen, M. et W. Meckling, W. (1976), « Theory of the firm: managerial behaviour, agency cost, and ownership structure », *Journal of Financial Economic* pp. 305-360.
- [28] Zohir, A. (2012), « La Théorie de l'Agence », Master : Management des Ressources Humaines et Dynamique des Territoire, Université Mohamed Premier Faculté des Sciences Juridiques Economiques et Sociales, Oujda
- [29] Berle, A.A. et Means, G. (1932), « The modern corporation and private property », MacMillan, New York (Edition de 1982)
- [30] Bozio, A. et Grene, J. (1917), « Économie des politiques publiques », Collection Repères, La Découverte.

- [31] Gattet, P. (2020), « Comprendre la théorie de l'agence », la revue audiovisuelle sur le monde de l'économie, la stratégie et le management des entreprises, XERFI Canal.
- [32] Smith, A. (1776), « La richesse des nations », Ed. Flammarion 1991.
- [33] Coase, R. H. (1937), The nature of the firm. *Economica*, 4 : 386-405.
- [34] Barnard, C. I. (1938), « The Functions of the Executive », Cambridge, MA: Harvard University Press
- [35] Jensen, M.C. et Meckling, W.C. (1976), « Theory of the firm: Managerial behavior, agency costs and ownership structure », *Journal of Financial Economics*, Volume 3, Issue 4, p 303-431.
- [36] Aamoum, H. et Nakri, S. (2021), « L'étude de la divulgation volontaire d'informations à propos du capital immatériel à la lumière de la théorie de l'agence et la théorie du signal : Quels déterminants pour quels objectifs ? », *International Journal of Accounting, Finance, Auditing, Management and Economics - IJAFAME* ISSN : 2658-8455 Volume 2, Issue 5.
- [37] Osseonon, A.C. (2022), « Motifs de divulgation volontaire d'informations sur le capital immatériel : cas des entreprises cotées à la BRVM », (LSO) Université Felix Houphouët-Boigny Cocody/Abidjan – Côte d'Ivoire, *Revue Française d'Economie et de Gestion* ISSN: 2728- 0128 Volume 3: No 12.