

Department of Business and Management

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**“M&A ACROSS THE METAVERSE”: AN EMPIRICAL
ANALYSIS OF NIKE’S ACQUISITION ON RTFKT**

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Introduction

In today's highly globalized and interconnected economic landscape, characterized by ongoing market volatility, companies have to face challenges and contextual changes. Among these, the globalization of competition stands out as a transformative force, fundamentally altering the strategic approaches of companies. In this dynamic environment, enterprises must remain agile and proactive in responding to sudden market fluctuations by devising innovative ways to address evolving or emerging consumer demands.

This phenomenon is accompanied by the significant expansion of the M&A market, as these operations are considered by companies as the most efficient and rapid means to achieve both short and long-term growth, access new markets, embrace new technologies and innovations, and maximize both private profits and public welfare. For these reasons, M&A transactions have increasingly become a core component of companies' strategies aimed at gaining a competitive advantage. In fact, in 2021, global M&A activity reached an all-time high, with a historic market value of \$5.9 trillion. However, from 2022 to the present, both the volumes and values have experienced a sharp decline, in light of a highly uncertain economic landscape and an unstable geopolitical situation. Despite this, businesses are still eager to finalize agreements, although on a lower scale.

The most attractive sectors for M&A operations in terms of growth prospects are undoubtedly those related to the technological, digital, and virtual world (comprising over 20% of all agreements in 2022). This realm is primarily populated by innovative start-ups and small companies with significant growth prospects that aim to meet market demands. They are primarily funded by two entities, Venture Capital Funds and Private Equity firms, which share the common goal of filling the void left by institutional debt capital providers by investing institutionally in equity capital in unlisted companies, with the subsequent aim of realizing a capital gain upon divestment.

The explosion and proliferation of blockchain technology and all that it entails (Metaverse and NFTs, primarily) have certainly given an even stronger boost to innovation and the proliferation of start-ups, prompting established global brands in various sectors to start an unprecedented process of digital transition. The world's most prominent brands are embracing this new technological frontier, enhancing their internal processes, engaging in M&A activities with specialized companies in the field,

and venturing into a new virtual universe with economic and social repercussions that are more than real.

The purpose of this paper is:

- Analyse M&A operations using historical and market data, defining them in their main and distinguishing aspects;
- Emphasize the potential of Blockchain technology, which is still not fully exploited, to increase the reader's awareness of its uses and the impact it can have on companies;
- Evaluate, from both a financial and strategic perspective, the company Nike before and after the acquisition of RTFKT, using the main valuation methods.

To better convey the research's goal and scope, this introduction aims to delve more deeply into the topics covered in each chapter.

The thesis begins with a brief introduction to what the Merger and Acquisition process is and how it creates value for companies, assisting them in achieving their financial, strategic, and managerial objectives. The first chapter describes the ways in which a company can grow, both organically (through investing in R&D) and inorganically through M&A. It proceeds with a study of the different types of M&A deals, the stages that include this process, and the chapter concludes with both a historical analysis of M&A transactions and an examination of current global trends, providing the reader with an overview of how transactions volumes have evolved over time.

On the other hand, the second chapter focuses on the world of start-ups, going deep into their business and financial characteristics and the stages of their lifecycle. It also includes a discussion of the main sources of funding for these companies, VC and PE, and the strategies for divestment that can be implemented to achieve a capital gain from the investment made.

The dissertation continues with the third chapter, which aims to provide the most accurate and technical description of Blockchain technology, which has had and continues to have a profound impact on the financial world and companies. Starting from Blockchain, the chapter unfolds by delving into its applications: Cryptocurrencies, Smart Contracts, Metaverse, and NFT. These innovations are

analysed, not only in terms of their intrinsic value but also by relating them to the real world and highlighting the benefits that these technologies can bring.

The paper concludes with a case study: the acquisition of RTFKT, a digital fashion start-up specializing in NFT collectibles, by Nike, a colossal and historic brand in clothing and footwear. Since Nike did not disclose the price of this operation, and RTFKT is a very young company with limited historical data, it was decided to evaluate Nike from 2020 to 2024 using three models: Discounted Cash Flow, Dividend Discount Model, and Multiple Methods, all of which are theoretically explained. The purpose of this valuation is to determine if Nike's current price is indeed fair and, more importantly, to understand if the company has genuinely benefited from this acquisition, the reasons behind this operation, and what the future may hold for the world's most famous clothing brand.

Chapter 1: What is an M&A transaction and how it creates value

In the current highly interconnected global economy, characterized by rapidly changing markets, companies face constant challenges in their quest for growth, competitiveness, and long-term survival. The rise of global competition has compelled companies to adapt their strategies more frequently, ensuring they can swiftly respond to market shifts and effectively meet evolving consumer demands. Consequently, mergers and acquisitions (M&A) have become increasingly popular as a means for companies to achieve their strategic objectives. This is primarily due to the inherent speed associated with M&A transactions compared to internal growth strategies, enabling companies to easily enter new markets or gain access to new technologies, innovations, and capabilities in a flexible manner. Additionally, M&A serves as a mechanism for enforcing capital market discipline, improving management efficiency, and maximizing both private profits and public welfare. Even smaller or less profit-focused organizations can utilize this tool to survive and thrive in emerging markets. Thus, M&As have become a crucial component of companies' strategies to gain a competitive advantage. When large companies, with shares dispersed among numerous shareholders, undergo takeovers, an acquisition can occur without necessarily acquiring a majority stake, as long as the ownership allows for control. Takeovers are resource allocation transactions, but distinct from ordinary resource allocation operations, as they have certain unique features:

- They are sporadic; they are different from the usual experiences of managers. The diversity concerns both the strategic nature of the transactions and the organisational context in which they take place, i.e., that of the acquired company;
- They are opportunistic, i.e., they may be determined by market opportunities and not be the result of a deliberate strategy;
- They must be concluded quickly, in light of the possible inclusion in the negotiation of other parties that, in addition to making the transaction riskier, contribute to raising its price;

- They are characterised by limited access to information. The managers of the acquired company are hardly willing to disclose confidential data on customers, technology, market demand or financial situation.

In his study of Conventions and Definitions, Singh (1971) highlighted that although the phrases "takeover," "merger," and "acquisition" are frequently used interchangeably, they each have different economic meanings. A takeover or acquisition occurs when the acquiring company buys more than 50% of the equity of the target company in the context of acquiring firms taking control of the target firms. In contrast, a merger entails the joining of at least two firms to form an entirely new legal organisation. (Hampton, 1989; Singh 1971).

According to Hampton (1989), a merger is the joining of two or more corporations, denoted as $A + B = A$ or B or C , when only one firm survives. Singh (1971), on the other hand, represents a merger as $A + B = C$, signifying the creation of a new entity. In a merger, the difference in negotiation power between the acquirer and the acquiree is the crucial differential.

According to Georgios (2011), an acquisition entails a larger and financially stronger organisation buying a smaller one, but a merger occurs when two or more businesses combine to form a single entity. Khan (2011) offers another definition, stating that a merger is the consolidation of two or more firms into one or more entities. Meanwhile, Durga, Rao, and Kumar (2013) define mergers and acquisitions as activities that include takeovers, corporate restructuring, or changes in corporate control, ultimately leading to alterations in the ownership structure of companies.

Andrew J. Sherman (2011) provides one of the most comprehensive definitions, describing a merger as:

“A combination of two or more companies in which the asset and liabilities of the selling firm(s) are absorbed by the buying firm. Although the buying firm may be a considerably different organization after the merger, it retains its original identity.”¹

¹ Andrew J. Sherman, *Mergers and acquisitions from A to Z*, 3rd ed, 2011.

In conclusion, although these terms are often used interchangeably, there are subtle distinctions between a takeover, merger, and acquisition that highlight variation in the level of control, organisational structure, and negotiation power among the involved firms.

M&A transactions can create value for the participating companies in several ways:

1. **Synergies:** Mergers and acquisitions often aim to capture synergies, which are benefits that arise from the combination of two companies. Synergies can be realized through cost savings, such as eliminating duplicate functions or streamlining operations, or through revenue enhancements, such as cross-selling products or accessing new markets. By combining resources and capabilities, the merged entity can achieve greater efficiency and competitiveness, leading to increased value.
2. **Economies of Scale:** M&A transactions can enable companies to achieve economies of scale, which refers to the cost advantages that result from an increase in size or scale of operations. With a larger market share or production capacity, the merged entity may benefit from lower unit costs, improved purchasing power, and increased bargaining leverage with suppliers. This can lead to improved profitability and value creation.
3. **Market Access:** Acquiring or merging with another company can provide access to new markets, customers, distribution channels, or technologies. This expansion of market reach can generate additional revenue opportunities and enhance the competitive position of the combined entity. By leveraging complementary strengths and customer bases, companies can unlock new growth prospects and create value.
4. **Diversification:** M&A transactions can offer diversification benefits by combining companies operating in different industries, geographic regions, or segments of the market. Diversification can help reduce risk and increase stability by spreading the revenue and earnings streams across multiple sources. This can be particularly valuable in mitigating the impact of market fluctuations or industry-specific risks.
5. **Financial Engineering:** M&A transactions can involve financial engineering techniques that create value through improved capital structure, tax planning, or restructuring. For example, combining companies may lead to optimized debt-equity ratios, increased financial stability,

and improved access to capital markets. Additionally, tax efficiencies can be achieved through restructuring or utilizing the tax attributes of the acquired company.

It is crucial to keep in mind that a company's major goal in seeking mergers and acquisitions is to collaborate with other businesses that can provide greater benefits than operating independently in the market. Such deals lead to increased returns on equity and shareholders' wealth while reducing operating costs for the company (Georgios and Georgios, 2011). Maximizing shareholders' wealth is a crucial objective of mergers and acquisitions, ensuring the company's survival in a fast and efficient market. The management supports these transactions as they provide them more power and allow them to further both the company's short- and long-term goals (Gattoufi et al., 2009).

Although mergers and acquisitions have the potential to bring value, it is crucial to understand that they also include risks and difficulties. The successful execution and realization of value from these deals can be affected by integration issues, cultural differences, regulatory hurdles, and the risk of overpaying for acquisitions. Overestimating possible synergies and paying excessive premiums for targets before the deal frequently cause poor performance by acquired companies. Additionally, challenges arise in achieving post-deal value creation, including determining the optimal integration speed, degree of integration, managing change, effective communication, sharing resources and knowledge, addressing employee motivation and turnover, and handling cultural integration.

1.1 Type of firm's growth

Firms view growth as a vital factor for their sustained success and prosperity due to various reasons. It enables them to attain the required size and resources for global competitiveness, invest in cutting-edge technologies, and gain control over distribution channels to secure access to markets. Growth also facilitates economies of scale and scope, broadens their reach and complements their offerings, enhances bargaining power with customers and suppliers, and fosters a reputation that attracts high-quality human capital. Edith Penrose captures this phenomenon of growth in the following manner:

“The term ‘growth’ is used in ordinary discourse with two different connotations. It sometimes denotes merely an increase in amount; for example, when one speaks of ‘growth’ in output, export, and sales. At other times, however, it is used in its primary meaning implying an increase in size or improvement

*in quality as a result of a process of development, akin to natural biological processes in which an interacting series of internal changes leads to increases in size accompanied by changes in the characteristics of the growing object”.*²

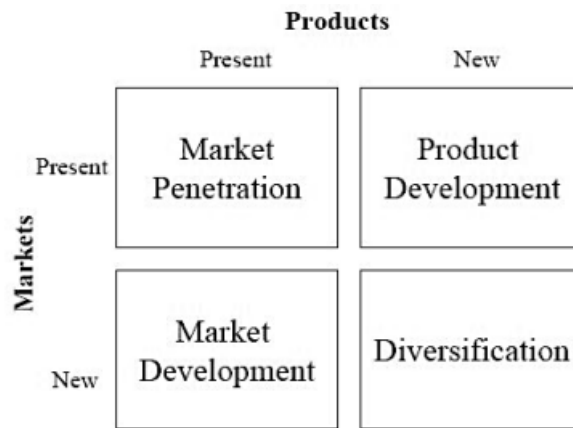
There used to be four different directions along which corporate growth processes moved, drawing on the well-known 'Ansoff Matrix' (1957):

- **Market penetration:** by continuing to operate in the same market segments and without making any changes to the products offered, one would expand sales volumes through appropriate pricing policies; in addition, if the new customers were initially competitors, one would increase one's market share;
- **Product development:** still operating in the same markets, one proceeds towards the enlargement or renewal of the range offered; in this case, one pursues a policy of differentiation from the competition;
- **Market development:** new markets are conquered with the current products, understood both in the sense of new geographical areas and new target customers;
- **Diversification:** the product range is renewed and developed and, at the same time, entry into new markets is sought, implementing diversification programmes of various kinds, and achieving economies of scope.

Although the Ansoff Matrix is one of the cornerstones of the growth plan, it should be pointed out that it is a dated and simplified concept. The model was developed in the 1950s and thus reflects the strategic business thinking of the time. As depicted in the diagram below, this matrix is based exclusively on two factors: products and markets, neglecting many others including, for example, the concept of competition.

² Edith Penrose, *The growth of the firm*, 4th ed. 2009.

Figure 1: Ansoff Matrix



Source: Ansoff, H.I., *Strategies for Diversification.*, Harvard Business Review, 1951

Generating a reasonable amount of profits is no longer sufficient for organizations. Many CEOs now believe that growth is imperative for maintaining economic health, and any disruption in growth can lead to stagnation³⁴. Businesses perceive growth positively due to various economic and strategic benefits, especially in today's competitive environment characterized by a global economy, which has a dual impact on firms worldwide. On one hand, it opens up new expansion opportunities in previously untapped areas, while on the other hand, it exposes enterprises to risks they were rarely exposed to before due to entry barriers and the absence of international trade. These effects, particularly the negative ones, are amplified in industries dominated by small businesses. Consequently, solutions must be developed considering the competitive environment, which increasingly influences the size limits of businesses.

In this context, we will explore the possibilities of firm growth and define the two different ways it can occur:

- **Organic growth:** This involves the company investing in research and development, leveraging its existing capabilities, competencies, and financial, managerial, and technological

³ In this context, the word “stagnation” means the condition in which a company has no growth and the company's profits remain static over time.

⁴ Daft R. L., *Business organization*. 6th ed, 2017.

resources to internally raise its size. Organic growth takes place over a longer period, as opposed to acquiring an already developed company operating in the target market. It encompasses activities such as increasing production capacity, diversification, and vertical integration;

- **Inorganic growth:** In this approach, the company plans to acquire another strategic company, spending time and money to do so. Inorganic growth is achieved through mergers or acquisition deals, such as purchasing a division, assets, or companies from the market, which accelerates the company's geographic expansion.

It's critical to emphasise that there is no scientific proof indicating that firm profitability will necessarily increase with either organic or non-organic expansion. The risk associated with the potential failure of the operation rises when choosing a development path since it necessitates a thorough grasp of strategic, economic, and organisational aspects both before and after implementation. Therefore, companies must choose “making” (internal expansion) and “buying” (expansion expansion).

Another avenue for growth is internationalization, which often relies on alliances and networks. In the modern world of low-cost and rapid global communication and transportation, firms are increasingly operating and expanding on an international scale. Consequently, the globalization of markets and the necessity to cross national borders now apply not only to large and established firms but to businesses of various sizes (Bloodgood, Sapienza & Almeida, 1996). Internationalization is no longer an alternative but a crucial prerequisite for growth.

Businesses that internationalise can receive several benefits from the global economy, such as economies of size, scope, and experience. Advantages can also be gained from a variety of factors, such as the diversity of local markets and demand patterns, differences in productivity and cost across geographic areas, the transfer of knowledge resources across different locations and areas of expertise, broader access to capital markets, the adoption of managerial best practises, and the attraction of new talent (Sicca, 2001). Exports, contractual agreements, joint ventures, and foreign direct investment are all examples of internationalisation. It can be followed as a growth strategy through organic or external growth.

1.1.1 Organic growth

Growth by internal lines consists in the implementation of new activities through the use and reinvestment of resources (human, financial and technological), skills and capabilities accumulated over time by the company and that it possesses internally, in order to foster the company's organic growth. Companies can implement internal growth paths in different ways depending on the conditions of the reference market as well as on the business strategies to be pursued. The most common modality consists in **implementing production capacity** through investments in both existing products/services that have generated past organic growth (*investing*) and expansive investments, such as the creation of new production, logistics and commercial units, useful to maintain one's market share in the face of an increase in demand or to increase it to the detriment of competitors. Other possible ways can be the introduction of new product lines and the creation of new subsidiaries of the parent company (*creating*). The third strategy comprises continuously optimising commercial activities and skills like as sales, pricing, marketing, and customer experience to outperform competitors (*performing*).

According to a McKinsey global survey, there is no one-size-fits-all recipe for generating organic growth. In fact, about 60% of respondents claimed that they have pursued organic growth largely through a primarily organic growth strategy in the previous five years. However, the remaining respondents took a more diverse approach, using two of the three options, or even all of them (Figure 2)⁵. These findings are logical since organisations seeking to develop new products or services frequently need to reallocate capital to invest in new product development, and strong commercial capabilities are required for successfully launching a wide range of new projects. Furthermore, the poll suggests that larger organisations are more likely to take a diversified approach.

⁵ In 2017, the survey collected feedback from 1,175 executives at C-level, senior management, and mid-level management positions. This diverse group represented various geographical regions, industries, firm sizes, and functional expertise.

Figure 2: Organic growth strategy, McKinsey global survey



Source: Ahuja, K., Segel, L.H., & Perrey, J., *Mastering three strategies of organic growth*. McKinsey & Company, 2018

Vertical integration methods⁶ can be used by businesses to grow their operations either upstream or downstream in the production chain from their core business. This strategy seeks to reduce costs, gain more control over the manufacturing process, boost market power, and realise administrative and managerial advantages. However, it may result in increased fixed expenditures, decreased flexibility, and difficulties balancing activities (Sicca, 2001).

An organisation, on the other hand, may choose a **diversification strategy** by forming a new entity within itself, which can take the form of conglomerate or correlated.

- **Conglomerate** diversification refers to expanding into sectors that have little or no technical, production, or market connection with the company's existing operations. This type of diversification is commonly seen in M&A transactions since the necessary technologies and competencies are challenging to develop internally within the organization;

⁶ Vertical integration in a business refers to the degree to which the company engages in vertically connected activities involved in the production and sale of a specific output, which are conducted directly within the organization.

- **Correlated** diversification involves growth in areas where the new activities are similar to the current ones in terms of production, distribution, and marketing processes. This type of diversification allows for significant synergies between the existing and new activities.

The reasons behind the push towards diversification in the domestic growth process can be (Fontana and Caroli, 2017):

1. The exploitation of excellent resources and skills outside the sector of origin;
2. The utilisation of excess capacity and the search for new opportunities⁷;
3. The exploitation of economies of scope to ensure e.g., a more efficient allocation of resources;
4. The development of an internal market if diversification leads to the creation of a business group in which resources such as financial and human capital can be exchanged.

The advantages of organic growth strategies include the transfer of critical intangible resources, such as technological know-how, which is facilitated using human capital in the organization itself. Furthermore, utilising these internal resources in new business development promotes the growth and strengthening of entrepreneurial culture. Growth by internal lines can lead to a correct sizing of investments, full control of choices and the absence of risks linked to extraordinary operations such as acquisitions (information asymmetries, integration process between companies). Moreover, endogenous growth is characterised in its nature by rather long lead times: many years may pass before the growth process is fully realised. The length of these timescales, however, allows firms to approach growth gradually, producing skills and knowledge that are accumulated over time and making the resulting competitive advantage more defensible (Rispoli, 2002).

However, the time factor also poses a drawback, especially in modern industry contexts, where any delay in investment can lead to missed business opportunities. Another disadvantage lies in the possibility of the company facing significant shortages in terms of essential technological resources, managerial skills, or other critical resources necessary for the success of the new venture. This

⁷When the company has capacity over the requirements of its business in its home sector. The most obvious case is financial capital.

highlights the need for the company to have surplus resources before implementing this growth strategy.

Furthermore, from an organizational perspective, internal growth may involve fewer challenges compared to external growth. However, industry-specific factors sometimes make external growth necessary, as it becomes essential for achieving rapid growth.

1.1.2 Inorganic growth

“It is clear that you cannot stay in the top league if you only grow internally. You cannot catch up just by internal growth. If you want to stay in the top league, you must combine.” (Daniel Vasella, Chief Executive Officer, Novartis, July 2002)

As an alternative to the previously mentioned approaches, firms can pursue external growth strategies to overcome the limitations inherent in organic growth. External growth involves seeking strategic assets outside the organization to create synergistic value. In today's global market, where firms are increasingly interconnected and interdependent, especially in terms of technology ownership, the traditional hierarchical model of vertical integration is becoming less prevalent. Instead, businesses favour continuous access to external sources of supply through collaborative strategies with other partners. This allows firms to share resources and knowledge, foster innovative processes, and aim for long-term competitive advantage and shared value creation.

While internal development allows corporations to have a deeper understanding and control of leading technologies, it also risks isolating them from technology breakthroughs occurring outside their organisation. The key reason for businesses to pursue external expansion is the faster time period they may compete. Unlike organic growth, which involves gradual and uncertain investments, external growth significantly reduces the timeframe and provides a more certain outcome, as it involves acquiring resources and technologies that have already been tested in the market. However, external growth often comes with significant organizational challenges related to integrating different companies, which, if not addressed properly, can lead to a crisis of the entire corporate structure.

Partnerships can encompass various activities of a firm, ranging from research and development to production and marketing, involving different actors such as suppliers or customers in vertical

collaborations, competing firms in horizontal collaborations, or companies offering complementary resources to those already owned internally. In many contexts, business relationships are recognized as one of the most valuable intangible resources. According to Hakansson, they contribute significantly increasing productivity and efficiency within the firm and stimulate the flow of information between the involved companies in the relational system. It is essential to note that alliances do not lead to a real increase in the size of the firm but still represent a growth path as they expand the firm's market scope and business opportunities (SICCA, 2001).

The primary models of strategic collaboration are explained in terms of the different forms of partnerships that a company could explore when implementing an inorganic growth strategy:

- **Contractual arrangements:** contracts aimed at gaining access to other firms' resource assets while minimising time. The contracting parties maintain their legal independence. The following are the most popular contracts:
 - a. **Franchising:** a type of corporate collaboration in which one party, known as the franchisor, offers a third party, known as the franchisee, the right to advertise items or services under its business name and/or trademark for a fee. The franchisor monitors the franchisee's activities and provides technical support and guidance as needed to ensure that the franchisee follows the franchisor's quality standards, production and management models.
 - b. **Licensing:** a contract in which a licensor offers a licensee the right to exploit specific products or assets (tangible or intangible) owned by the licensor in a specified geographical environment. The licensee agrees to pay the licensor royalties depending on the results gained in exchange for this privilege.
- **Strategic alliances**⁸: Partner firms collaborate while remaining legally separate entities, to achieve medium- to long-term objectives. One form of collaboration in this context is equity-

⁸ Strategic alliances are formal medium- to long-term agreements between two or more parties with the specific goal of achieving certain objectives that support the competitive or growth strategies in the markets of the participating partners. Unlike regular commercial arrangements, these alliances have a more profound impact on the development of the involved parties and involve significant forms of control. Caroli M., *International business management*. 3rd ed. McGraw-Hill.

type agreements, where partners jointly participate in establishing a new independent enterprise in which they hold equity stakes. If these ventures involve more than two entrepreneurs, they are commonly known as *business consortia*. A consortium takes the form of a contractual arrangement where a consortium company is established, and its profits are not taxed, with the benefits being shared among the participating entities. The newly formed legal entity resulting from the transaction has the specific objective for which the contract was entered into, which could be the execution of a project, the development of a product, or a particular technology. Joint ventures or capital venturing are among the most prevalent types of strategic alliances within this category of collaboration.

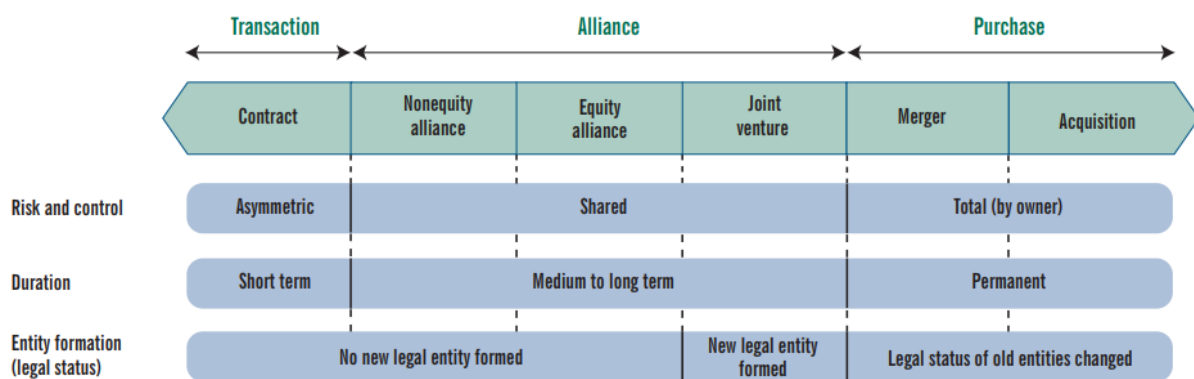
- a. Legally, a **joint venture** is also regarded as a contractual agreement among specific parties to undertake a project, for which the partners commit to making the necessary investments and, in return, will share the benefits produced in proportion to their contributions⁹. While such a transaction represents a significant growth opportunity, it also comes with numerous critical issues. Conflicts may arise between the partners concerning objectives, investment scope, differences in corporate cultures, governance structure, and connections to parent companies.
 - b. **Capital venturing**, On the other hand, capital venturing involves an investor or a company providing venture capital to finance the establishment or expansion of an external business operating in sectors with high growth potential.
- **Mergers and acquisitions:** these are the most financially demanding external growth strategies that will mostly change the organizational structure. They consist in extraordinary operations that can be defined as external growth processes through which a company obtains the capabilities and resources necessary to implement a certain strategy by acquiring or merging with another company that is already established. This growth mode has been implemented for a long time by the most advanced capitalist economies, primarily in Anglo-Saxon countries, although recent years have seen a spread at both national and international levels. In fact, merger and acquisition operations, whereby the control of a firm is acquired by

⁹ Typically, these collaborations entail creating a new company by pooling the resources of its founders (parent companies).

another firm giving rise to a single legal entity or a group of firms, respectively, have profoundly changed the industrial structure since the end of the last century (Benfratello, 2001). They are classified as extraordinary finance transactions because they require modifying the company's bylaws. Although the terms "merger" and "acquisition" are sometimes used interchangeably and as synonyms, they have slightly different connotations. While the two firms may merge based on a contract in both scenarios, there are also cases of so-called hostile takeovers, in which a company obtains the majority stake in a weaker company against its management's desires. In the next lines, we will discuss the hostile takeover paragraphs. These operations are favoured by particular environmental or market situations, which make the process of growth by external lines preferable to internal growth. They, therefore, assume greater relevance on particular occasions, such as the implementation of growth processes in mature sectors, where it is difficult to erode market shares from competitors, or in cases where the time factor is crucial (Meglio, 2004).

From the point of view of control, the corporate relationships seen so far can take various forms, which can be summarised in a range where at one extreme are short-term transactional relationships usually formalised in a contract (e.g. the supply relationship); at the other extreme are acquisitions and mergers, where the control relationship takes on a permanent connotation.

Figure 3: The spectrum of corporate control ranges from short-term transactional relationships to full-fledged acquisitions.



Source: Cools K., Roos A., *The Role of Alliances in Corporate Strategy*, Boston Consulting Group Report, 2005

1.2 M&A deal classification

We have seen so far that extraordinary finance transactions, commonly known by the acronym M&A, are inorganic growth strategies for a company. It is now necessary to outline a framework that seeks to represent, as completely and comprehensively as possible, the different types of transactions that can be implemented. It is therefore necessary to clarify the criteria for subdividing the transactions that can be adopted; in fact, mergers and acquisitions can be classified in different ways depending on the characteristic that is being considered. The first way of classification is based on the relationship between the acquiring enterprise and the target enterprise:

- **Horizontal M&A**, or horizontal integration, involves transactions where enterprises operating within the same business sector come together to produce the same products and/or services. Such mergers can lead to several positive outcomes, including increased market share and reduced competition. By combining forces, companies can capitalize on synergies derived from sharing complementary resources and knowledge. Additionally, the integration process between firms is facilitated by their similarities in processes, resources, and organizational cultures, enabling them to complement each other in R&D and enhance overall quality and efficiency. Moreover, horizontal M&A can result in the elimination of duplicate labor and the efficient utilization of equipment, leading to reduced fixed production costs. It is important to note that the risk of creating a concentration of firms is merely a possibility rather than a general assumption, as the impact on competition depends on a comprehensive and complex analysis. The Antitrust authorities must conduct studies¹⁰ to assess the competition structure, market opportunities for growth, and the category of products and services involved before expressing opinions on such operations.

A specific type of horizontal M&A is known as a "bolt-on acquisition," wherein a larger company acquires smaller firms that operate in the same line of business and hold strategic value. The acquiring company then integrates the acquired entity into one of its divisions. This

¹⁰ In the study of the competition structure, the commonly cited discriminant is the market concentration. It can be represented by the Herfindahl-Hirschman Index (HHI) and it is used by the US Department of Justice when evaluating a potential merger issue. It is calculated as the sum of the square market share percentage. The corresponding formula is $HHI = \sum_{i=1}^n s_i^2$.

approach allows the parent company to gain competitive advantages at a lower cost compared to implementing the necessary changes on its own.

- **Vertical M&A** or vertical integration: the firms under consideration are those operating at different stages of the same production process, that are operating at different levels of the production chain. The positive effects originated by such operations come from the possible reduction of costs, given by economies of scale as well as the elimination of transaction costs, the greater control that can be exercised over the entire production chain, the decrease in the bargaining power of suppliers and purchasers and consequently the increase in business volumes. The objective underlying such initiatives is, therefore, to strengthen autonomy in the sectors in which one acts through the exercise of direct control over supplies (with advantages in terms of cost and quality control) or over the placement of one's own products on the market (which, in addition to cost reductions in distribution, allows to constantly monitor the market, enabling the company to anticipate needs and changes). However, it is necessary to bear in mind that integration of this kind entails risks mainly linked to the company's loss of flexibility; in this way, the company may preclude itself from changing its sources or volumes of supply even if opportunities arise that are more convenient than internal production, such as external suppliers who, following technological changes in the sector for example, are able to offer more recent or innovative products or processes. Finally, the complete or partial integration of the supply chain increases the overall risk of the company in the event of unfavourable circumstances affecting several production stages simultaneously.
- **Conglomerate M&A**: Involving firms operating in unrelated industries and producing different goods and services, conglomerate mergers lead to a process of diversification, which can take various forms: a. Product expansion mergers, where companies integrate their production lines; b. Geographic market expansion mergers, involving companies operating in non-overlapping geographical areas (internationalization); c. Pure conglomerate mergers, targeting non-commercial activities related to each other¹¹.

¹¹ Berk J. & De Marzo, P., *Corporate Finance*, Global Edition 5th ed, Pearson, 2019.

The primary aim of a conglomerate merger is to increase the number and variety of the company's output, while also seeking profits through the exploitation of synergies and cross-selling operations. Mergers and acquisitions are among the most frequently used tools by managers to enter new markets different from their own. The reason is simple: through such operations, managers can explore new markets with less financial commitment compared to independently developing the same strategy. Moreover, utilizing such operations allows entry into a new market by leveraging the knowledge, products, and processes of the target company, facilitating the entire process. However, it should be noted that compared to the operations seen earlier, initiatives involving companies from different sectors are less common because these types of operations entail higher risks and difficulties due to:

- Rigidity and slowness resulting from increased size;
- Increased coordination costs and costs associated with increased size;
- Lack of knowledge and experience in acquiring managers in the target company's sector.

Another distinction to consider is whether the merger or acquisition is domestic or transnational. In the domestic case, both companies involved are owned by the same country, whereas in the transnational case, the transaction occurs between foreign companies and a domestic company in the target country. **Cross-border M&As**, unlike domestic M&As, are deals in which the assets of corporations situated in separate countries are united to form a new legal entity¹². Unlike ordinary portfolio investments intended to acquire a stake, these M&As are structured as direct investments abroad targeted at gaining control over the company's management. The acquisition of external companies provides the enterprise with market outlets, knowledge, resources, and human and relational capital. A cross-border merger and acquisition's target

- *Subsidiary companies*: enterprises in which a foreign investor owns at least 50% of the share capital;

¹² Caiazza R., *Cross border M&A, Key determinants and critical success factors*. G. Giappichelli Editore, 2011.

- *Associate companies*: businesses in which the foreign investor owns 10% to 50% of the share capital;
- *Branches*: non-legal entities held entirely or jointly by the foreign investor.

As firms expand internationally, they seek additional resources and skills not available in the domestic market, aim to enhance business efficiency within and outside national borders, and search for new growth opportunities, cross-border mergers and acquisitions could have broader positive efficiency effects¹³. However, such transactions also pose challenges, particularly when dealing with emerging economies where the underlying worth of enterprises may be overstated. Conducting a thorough Due Diligence procedure is crucial in these transactions, and an investment bank or advisory firm acting as an intermediary can facilitate this process.

Cross-border M&A transactions also introduce additional risks related to the country where the acquisition takes place, such as political risk, social risk, and general risk related to "Black Swan" events¹⁴. It seems obvious that the potential gain from synergies and possible pitfalls are likely to be greater for buyers in emerging countries than for those in developed countries. Firms can leverage knowledge gained from local operations and apply it to cross-border activities or use domestic resources to support international acquisitions. Additionally, the implications for market power are mixed, as international mergers and acquisitions can create weaker anticompetitive effects in the product market due to reduced pre-acquisition competitive rivalry. As a result, companies' purchase portfolios may feature a combination of domestic and overseas activities complementing each other. In an article in 2001, analysing the deals that have taken place in the market, Joseph L. Bower proposed another M&A classification, considering five different types of acquisitions¹⁵, and the relationship between firm characteristics and synergies pursued:

¹³ Bertrand O. & Betschinger M. A., *Performance of domestic and cross-border acquisitions: empirical evidence from Russian acquirers*, European Bank for reconstruction and development, 2011.

¹⁴ The term "Black Swan" refers to an unpredictable and rare event characterized by severe repercussions on the economic system. The concept was expounded by Nassim Nicholas Taleb, Wall Street trader, in his book *The Black Swan (On Robustness and Fragility, Deeper Philosophical and Empirical Reflections)*.

¹⁵ Bower J. L., *Not All M&As Are Alike and That Matters*, Harvard Business Review, 2001

- **The overcapacity deals** occur in industries which present a substantial overcapacity of the market such as the petrochemical and automotive industries. This acquisition is pursued with a strategic goal of lowering costs, achieving economies of scale and so reducing the production capacity of the entire sector;
- **The Geographic roll-up** occurs in an industry which presents a high level of fragmentation of the companies and, undertaking an M&A process, a company can raise its size and a higher size can have some strengths like easier access to the capital market. Usually, this operation occurs between a large buyer and a small company;
- **The Product/market extension** is a deal carried out with the aim of achieving geographical expansion or extending the range of products offered. In doing so, companies can pursue goals related to both related and conglomerate diversification, as well as internationalization;
- **The industry convergence** is related to the idea that a company pulls out synergies by undertaking acquisitions in industries linked to each other. Its purpose is to invent a new business through the convergence of apparently distinct sectors. The potential synergies obtainable in apparently different market segments are the bet on which these deals are based: success will depend mainly on the foresight of those who have bet on the possible convergence between sectors with different characteristics;
- **The M&A are substitute for R&D.** It happens frequently in the high-tech industry, where skills and know-how on products, services and processes are both difficult to imitate and essential to compete. This is why the need to internalise distinctive skills in the market in a short timeframe makes M&A particularly suitable. Cisco's president and CEO John Chambers says:

“If you don't have the resources to develop a component or product within six months, you must buy what you need or miss the opportunity”.

Figure 4: Joseph L. Bower M&A classification

Type of M&A	Strategic Objectives	Major Concerns
The overcapacity M&A	The acquiring company will eliminate capacity., gain market share, and create more efficient operation.	You can't run a merged company until you've rationalized it, so decide what to eliminate quickly. If the acquired company is as large as the acquiring one and its process and value differ greatly, expect trouble. Nothing will be easy. If it is so-called merger of equals, expect both companies' management groups to fight for control.
The Geographic roll-up	A successful company expands geographically, operating units remain local.	Members of the acquired group may welcome your streamlined process. If they don't, you can afford to ease them in slowly. If a strong culture is in place, introduce new values with extreme care. Use carrots, not sticks. These are win-win scenarios, and they often go smoothly.
The Product/market extension	Acquisition extends a company's, product line or its international coverage.	Know what you're buying the: farther you get from home, the harder is to be sure. Expect cultural and governmental differences to interfere with integration. The bigger you are relative to your target company, the better your chances of success.

The industry convergence	A company bets that a new industry is emerging and tries to establish a position by culling resources from existing industries whose boundaries are eroding	Integration should be driven by specific opportunities to create value, not by a perceived need to create a symmetrical organization. As a top manager be prepared to make the call about what to integrate and what to leave alone; also, be ready to change that decision.
The M&A as substitute for R&D	Acquisitions are used in lieu of in-house R&D to build a market position quickly.	Build industrial strength evaluation processes so that you buy first-class business. This category allows no time for slow assimilation, so cultural due diligence is a must. Put first-rate, well-connected executives in charge of integration. Make it a high visibility assignment. Above all else, hold on to the talent if you can.

Source: Bower J. L., *Not All M&As Are Alike and That Matters*, Harvard Business Review, 2001

Our attention is focused on publicly traded firms: There are two main types of transactions: friendly acquisitions and hostile takeovers. The classification depends on how the target company perceives operation and then, on the behavior towards it, that impacts the acquisition strategy.

- In the case of a **friendly takeover**, the directors of the target company support the transaction, engage in negotiations with potential buyers, and explore an agreement on a price to be approved by shareholders. This approach reduces the likelihood of a counterbid and leads to a shorter process through a cooperative series of steps undertaken by the target company's management. The aim is to finalize the deal and change various critical aspects in the post-acquisition phase.

- In a **hostile takeover** the management of the target company does not agree with the transaction or is unaware of it. The reasons why this happened can be the lack of cooperation and agreement between the companies, often influenced by the failure of previous attempts to conduct a friendly acquisition. To make the hostile takeover successful, the acquiring company must find enough shares to obtain control of the target company. This involves obtaining a sufficient number of votes at the shareholders' meeting to replace the current board of directors. The buyer company is referred to as a *raider* and so its strategy is to bypass the target company's management and approach the shareholders with the acquisition offer. To reach his scope, the acquirer may resort to a tactic named "proxy fight". The aim is to persuade the target company's shareholders to vote through proxies and support the acquirer's candidates in the board of directors' election. Of course, the acquirer tries to make evidence of the inefficiencies of the target company in the way that shareholders are in favor of their nominees in the BOD. The acquirer tries to gain control of the target company, it proceeds to tend an offer. The offer involves purchasing equity securities of the target company at a price that is higher than the market value and it extends the offer to all the target company's shareholders. These steps are promoted publicly by parties seeking to acquire control or all the securities of a listed stock company, unable or unwilling to buy the same securities by regular market channels. Subsequently, shareholders will have two choices: the first is to accept the buyer's offer and sell their share at the predetermined price; the second is to decline the offer and retain their ownership of the shares. In order to prevent the situation from happening, the target company may implement defensive tactics to dissuade the initiation or continuation of an existing offer and to make it less attractive or more challenging to process with the hostile takeover attempt. Among these clauses, we can distinguish:

- a. *Poison pills* are strategies to defend against hostile takeover attempts. These strategies involve the issuance of preferred shares that allow shareholders to activate barriers when a hostile takeover attempt occurs. In addition, options are reserved for existing shareholders to purchase a certain amount of shares at an advantageous price (below the market price). This makes the takeover process so costly for the acquirer that he may decide to abandon the takeover project. The goal of these measures is to increase

the number of outstanding shares (through a capital increase) to make the acquisition of the target company more costly. According to empirical evidence, when a "poison pill is adopted," a company's stock price decreases, while the takeover premium increases, by boosting the profit for the target. This makes the transaction less convenient for the hostile acquirer (raider) and more beneficial for its shareholders;

- b. *Staggered boards*: The staggered election of the board of directors means that, as the term of office is three years, only one-third of the directors have to be elected each year. This makes it difficult for third parties to take control, as a bidding candidate would have to win the proxy battle two years in a row to obtain a majority on the board. The time and difficulties necessary to carry out this transaction could deter the raider, who might then give up on the takeover. According to experts, the best defensive tactic a firm may use is the combination of a poison pill and staggered board elections;
- c. *Restructuring*: it consists of changing the financial structure implemented by the target company to make it less attractive to the buyers. It can be carried out in various ways, such as issuing debt securities to finance the distribution of dividends or the repurchase of own shares; It is possible to acquire unpleasant assets or sell an item to extract a hidden value (such as the sale of the crown jewels). It is not a shareholder-friendly action because it involves trying to make something less attractive, such as increasing or purchasing assets that make no sense for the acquirer;
- d. *White knight*: It is a defence technique that consists in the search for a friendly company from which to acquire, or to sell a substantial package of shares, in order to make it more difficult and thus discourage the attempt of hostile escalation of the buyer;
- e. The target company and its management may eventually pursue other defense strategies against hostile escalation attempts, such as demanding a *qualified majority of votes* (sometimes up to 80%) to approve a merger, *limiting voting rights* to those who own a large amount of shares or demanding that a fair price be paid, which is determined by the board of directors or senior management.

All acquisitions and mergers must be approved by the supervisory and control bodies. Sometimes, the target company managers adopt the defensive strategies just analyzed for opportunism and to pursue personal advantage. This creates conflicts of interest between managers and shareholders, which can be reduced by offering their managers a “golden parachute”, or an extremely generous liquidation guaranteed if the company is acquired and managers replaced. In a counterintuitive way, empirical evidence shows that the adoption of the gold parachute actually creates value by eliminating the opposition of managers to the acquisition (Brearly R. A. et al., 2015).

1.3 M&A strategic objectives

The motivations for takeover operations have changed with the market conditions. In particular, globalization has created the framework for multinational corporations that, in order to increase profits, take advantage of new market opportunities and ad hoc cost and fiscal structures. Theories derived from economic literature have been employed over time to support arguments for the causes of the spread of M&A transactions (Piesse, Lee, Lin, and Kuo, 2013). (Piesse, Lee, Lin and Kuo, 2013).

According to the **efficiency theory** of mergers, a 'friendly' merger is only proposed and approved when it is expected that the combination would provide sufficient realizable synergies to make the deal advantageous to both parties. It is supposed that the owners of the target company would not sell or submit an acquisition if the gain in value to the target was not positive, and that the bidder would back out of the deal if the gains to its owners were negative. Efficiency theory, which is utilized to forecast value creation with positive returns to both the acquirer and the target, serves as the foundation for the transaction.

In the setting of competing interests between the parties, **agency theory** tries to find the issues and potential fixes about the delegation of tasks from principals to agents (Linder and Foss, 2015). Since managers aim is to maximize corporate value, they may employ destructive techniques in the long run, severely harming the organization. This condition can be declined in the case of an M&A as a moral

hazard¹⁶ in the acquisition of a company could only lead to an increase in value in the short term. M&A operations reduce agency costs through a method of compensation for management through MBO¹⁷ reward plans. As a result of an M&A transaction, the shareholding of the management shareholder increases, making the management a substantial shareholder. The MBO in this context provides powerful incentives to increase productivity as a result of aggregation.

The **Free Cash Flow Hypothesis** is the result of Agency Theory and their narrow relationship. The free cash flow is what remains after all costs and investments found by the business. Jensen said that managers frequently hesitate to distribute excess to shareholders for two reasons:

1. it reduces the resources under management control;
2. dividends are just compensation programs, so the wealth of executives is not increased.

The company's significant free cash flow makes it an attractive option for a prospective acquisition even though the dividend is not actively promoted. Due to the project's capital-intensive nature, a financially sound corporation is desired to lower debt borrowing costs. In his 1987 expansion of this theory, Jensen suggested that management of companies with large free cash flows, particularly those with little opportunity for growth, would probably pursue mergers that would destroy value. One of his statements best captures this bad practice:

“Debt formation allows managers to successfully bond their promise to pay out free cash flows.”
(Jensen, 1987).

The **Market Power Hypothesis** aims to offer more backing for vertical and horizontal takeovers. Market power is described as a company's capacity to command supply and service/product prices above the level of the competitive market. This is directly tied to both M&A activity and the size of the company. In fact, acquisitions guarantee quick growth and let businesses broaden their global presence while obtaining more market share. The possible advantages of acquiring market dominance,

¹⁶ Moral hazard is a situation in which one party gets involved in a risky event knowing that it is protected against the risk and the other party will incur the cost. It arises when both parties have incomplete information about each other (The Economic Times).

¹⁷ MBO stands for Management By Objectives and, as the name implies, is a method of evaluating resources based on the results achieved against common goals that have been set by the company.

in line with oligopoly and monopoly theories, are largely greater revenue and higher entry barriers as a consequence of market concentration.

The **Diversification Hypothesis** tries to explain other acquisitions, in particular conglomerate acquisitions. According to **Lewellen's coinsurance Hypothesis**, a conglomerate's value exceeds the value of its individual companies due to the reduced firm risk and greater credit capacity.

According to the **Bankruptcy Avoidance Hypothesis**, taking over financially distressed companies is another reason for engaging in M&A deals. In fact, a successful takeover might be preferable to failure¹⁸. For the acquirer, the primary benefit of purchasing a distressed target is the payment of a cheaper price; for the target company, the benefit is the prevention of job loss and the fact that the shareholders are compensated. The merged company's ability to carry more tax subsidies is reflected in its higher debt capacity, and the tax shelters supplied by borrowings play a crucial role in valuation.

The Information Hypothesis assumes efficient markets and affirms that every firm specific policy statement can affect how the market value of the firm is determined. M&A transactions can be an exception since both the target and the bidder are required to provide confidential operational and financial information. These valuation shifts, however, may only be anticipated under conditions of strong market efficiency¹⁹.

The **Accounting and Tax Hypothesis** is the last factor that affects M&A deals. Takeovers are encouraged in nations where it is more convenient due to the various goodwill accounting methodologies that affect all post-merger performance assessments and the various taxation regimes (Al Karaawy and Al Baaj, 2018). The business can also take advantage of the disparities in wage levels and treatment of trade unions by engaging in actual "salary dumping" that upends the cost structure.

What has been said allows us to divide the analysis of the reasons for mergers and acquisitions into three categories: financial, managerial, and strategic with a consideration of the synergies.

¹⁸ Shrieves R. & Stevens D, *Bankruptcy avoidance as a motive for merger*, Journal of Financial and Quantitative Analysis, 1979.

¹⁹ According to Fama E. (1970). Efficient Capital Markets: A Review of the Theory and Empirical Work, in the capital market there are 3 levels of informational efficiency. The strongest one affirms that the information set includes all historical information as well as all public (including prospective analyses, forecasts, and so on) and private information.

1.3.1 Financial goals

From a financial perspective, a corporation may have a variety of incentives for engaging in M&A activities, but they all attempt to enhance the current financial standing and performance of one or more parties.

One of the reasons is taking advantage of market opportunities by *capitalizing on stock market inefficiencies*. Since stock market valuations are based on projections of future performance, estimates of growth, and risk factors, companies may use confidential data and analysis to determine that the true value of stocks does not correspond to the current market value. This creates possibilities for mergers and acquisitions, where a prospective purchasing company may make a bid for a business that is undervalued in the market or utilize its overvalued equity to buy another company. These acquisitions don't have any synergistic advantages, furthermore, these transactions are typically concentrated among acquirers who have the most governance issues. Transactions by overpriced acquirers seem to be driven more by increasing CEO compensation than by increasing shareholder value.

Gaining access to financial economies will boost the acquiring *company's borrowing capacity* and decrease financing costs, which is another financial motivation for conducting an M&A. In fact, the bidding company can reduce its exposure to debt, raise leverage, cut its cost of capital, and generate financial synergies by purchasing a less indebted firm.

In this sense, a business might employ M&A as a component of its diversification plan. Multiple advantages of diversification include less risk, cheaper debt cost or higher borrowing capacities, and improved liquidity. The broad, diversified firm carries less specific risk in terms of reducing hazards since it is seen as an extensive portfolio of securities. Conglomerate diversification lowers portfolio risk through investments in firms that are unrelated to one another. Due to the challenges of managing a multi-business firm, diversification incurs numerous costs, including agency charges. Therefore, before putting into practice a diversification plan, a business must determine if the positive effects of diversity exceed the drawbacks.

In terms of *debt capacity*, a large and diverse firm is less likely to go bankrupt when faced with the same level of debt. Such companies may borrow more money while paying less in taxes. This is

because when two firms combine, their profits and cash flows become more stable and predictable, enabling them to borrow more money than they otherwise could have. Also, it gives tax advantages to the merged company. This tax benefit may appear as either increased cash flows or a decreased cost of capital for the combined firm. In the end, the shareholder base of unlisted companies is usually under diversified. Increased liquidity and the potential to lower risk exposure are two benefits that shareholders of unlisted companies receive when an acquiring entity buys them. The liquidity offered is a big incentive for the target's shareholders to agree to the takeover transaction.

A diversified corporation might benefit from *tax synergy* by balancing the profits and losses of its many divisions. With an M&A deal, this tax benefit would be available immediately, without having to wait for profits to be made. The law, on the other hand, sets stringent restrictions on M&A deals that are only meant to use a target company's previous losses, favoring deals that are meant to add value to the industry. The regulations governing the United States International Revenue Service²⁰ are taken into account in the analysis of many U.S. enterprises. There are several unusual circumstances in which these payments can be postponed, even though this legislation mandates that the target shareholder must pay taxes on the capital gain caused by an all-cash transaction promptly.

1.3.2 Managerial goals

Management plays a crucial role in the corporate choice to pursue an expansion strategy through significant transactions.

The inclination towards these kinds of operations, which fuel *rapid dimensional growth*, stems from the fact that managers are incentivized in this direction due to their compensation being more closely tied to the company's size than its profitability and efficiency, resulting in conflicts of interest. The phenomenon of "*empire building*" occurs when managers have the leeway to diversify the company's endeavors by making acquisitions that might benefit or solidify their positions but are not necessarily in the shareholders' best interests. Managers might be driven to enhance their compensation by increasing the company's size through mergers that don't necessarily maximize value or by engaging

²⁰ The U.S. International Revenue Service (IRS) is the revenue service of the United States federal government. Its aim is to collect taxes and to manage the Internal Revenue Code of 1986, the federal statutory tax law of the United States of America.

in "expense preference" behavior, essentially overspending on perks. Given that managerial compensation often depends on the amount of assets they oversee, managers are more inclined to seek higher asset growth rates rather than focusing on profits (Marris 1964).

From an *agency motive*, managers might undertake acquisitions that don't align with shareholders' interests. According to Amihud and Lev (1981), managers might engage in conglomerate mergers to broaden the company's activities and stabilize earnings, thereby securing their own positions. However, this contradicts shareholders' interests, as they could achieve diversification on their own at a much lower cost.

Additionally, another rationale behind top management's decision to pursue mergers and acquisitions lies in psychological rewards. Executing such transactions brings *significant visibility to CEOs*, along with increased power and influence. These moves attract substantial public attention and media coverage, effectively elevating CEOs to a quasi-celebrity status.

The Hubris Hypothesis provides support for this phenomenon²¹: decision-makers within acquiring companies tend to overpay for their targeted companies on average. The Hubris Hypothesis helps explain why the pursuit of a bid persists even when valuation errors lead to an estimation above the current market price. Managers hold a mistaken belief that they possess superior abilities compared to other management teams, enabling them to effectively control and oversee diverse firms. This indicates that their decision-making is marked by arrogance and self-centeredness, ultimately resulting in the bidder firm overpaying for the target. This overpayment jeopardizes the shareholders' interests.

However, in the realm of corporate governance, certain takeovers are primarily driven by the belief that merging can enhance efficiency by bringing together companies with unequal managerial competencies (Copeland et al., 2005). A more efficient bidder might acquire an inefficient target. In this scenario, the bidder could be under the impression that its managerial skills are robust enough to elevate the target's value under its improved control. On the contrary, the bidder might pursue a merger with a target firm because it perceives the target's management as capable of enhancing the bidder's

²¹ Roll R., *The Hubris Hypothesis of Corporate Takeover*, The Journal of Business, 1986.

efficiency. Manne (1965) proposes that acquisitions, through the market for corporate control, offer a solution to the agency problem.

Finally, the *imitative factor* has an impact on management's perspective toward mergers and acquisitions: historical trends reveal distinct waves of M&A activities concentrated in specific sectors. Consequently, companies often follow these patterns to prevent lagging behind competitors and experiencing a loss of market share.

1.3.3 Strategic goals

The main objective of M&A transactions, as previously mentioned, revolves around obtaining resources and capabilities that are either non-transferable or challenging to replicate. From a strategic standpoint, this translates to achieving a competitive edge and enhancing one's competitive stance within the existing market. It could also involve expansion into new domains, industries, and geographical areas.

The critical question a company must address is how its management can ensure shareholders an investment opportunity yielding a positive Net Present Value (NPV). The answer predominantly lies in a company's capacity, distinct from that of individual investors, to generate added economic value by capitalizing on synergies. The exploitation of synergies stands as the predominant motive behind M&A endeavors. This concept underscores the notion that the combined worth of the consolidated entities surpasses the aggregate value of the individual components when considered in isolation. This combined entity is assumed to possess a favorable Net Acquisition Value (NAV). Precisely, the calculation of NAV involves:

$$\text{NAV} = \text{Value of combined firm} - [\text{Value of company A} + \text{Value of company B}] - \text{Premium paid for B} - \text{Expenses of the acquisition process}$$

Which can be summarized as:

$$\text{NAV} = [V_{AB} - (V_A + V_B)] - (P + E)$$

This formulation of the NAV is especially effective because it visually breaks down into two components: the synergistic effect enclosed within parentheses and a subsequent subtractive

component. It's readily apparent that for the merger to be advantageous, the synergistic effect must surpass the sum of the premium paid for the acquisition and the costs incurred throughout the process. Unfortunately, both components of this expression are challenging to estimate accurately, leading to a frequent overestimation of the final synergies resulting from the M&A.

Diverse forms of synergy exist, including revenue synergies and cost synergies. Realizing these synergies proves intricate on both fronts, as substantial integration efforts must be initiated early on, pinpointing the right avenues and objectives concerning revenue growth or expense reduction. According to comprehensive research and analysis by McKinsey & Co, the initial stride towards achieving enhanced revenue lies in meticulously identifying the origins of these synergies. A lack of clarity at this stage could result in numerous untapped opportunities. Similarly, with regard to cost synergies, a meticulous pre-closure analysis is imperative to ensure that the outcomes align with the anticipated cost savings pre-merger. Consequently, segmenting the cost-cutting analysis extensively based on divisions and areas of interest becomes necessary to unearth potential benefits. A significant proportion of the cost efficiencies stemming from mergers or acquisitions is undoubtedly linked to cost synergies through the volume effect. This mechanism substantially diminishes unit costs by distributing fixed costs across a larger volume within the production cycle. Finally, the sharing of complementary resources facilitates the elimination of duplicated operations, redundant processes, and workforce.

Operating synergies usually revolve around the impact of economies of scale²² and economies of scope. Managers particularly focus on reducing costs through the production of goods in substantial volumes, which enables the spreading of fixed costs and the reduction of certain unit variable costs. This is coupled with the exploration of cross-selling opportunities²³. Economies of scope, on the other hand, involve the overall cost reduction derived from the joint production of two or more products, compared to the costs incurred if these productions were separate.

²² Economies of scale are achieved when the average unit cost decreases as the quantity produced increases.

²³ Cross-selling is a prevalent marketing strategy involving the sale of an extra product to an existing customer. Within the context of mergers and acquisitions, this term specifically denotes the heightened sales opportunities that each of the merged companies can potentially tap into with the clients of the other company.

In contrast to operating synergies, financial synergies pertain to the influence of the operation on the final cost of capital (Weighted Average Cost of Capital, WACC) or the gearing ratios²⁴ of the combined entity. For example, following a merger, the incorporating company's or the resultant merged entity's debt capacity increases, while financing costs decrease. In fact, through a merger with a less leveraged company, the firm can enhance its leverage and reduce capital costs, leading to the realization of financial synergies. Furthermore, a notable source of financial synergy stems from the lower expenses associated with internal funding when compared to external financing (Copeland et al. 2005). For instance, a company boasting substantial cash flows and limited investment prospects might merge with a company needing additional capital due to restricted internal funds but extensive investment opportunities. The amalgamation of these two companies brings forth benefits derived from the reduced costs linked to the availability of internal funds.

Lastly, we should mention marketing synergy, which encompasses leveraging either a shared sales force, distribution channel, or media to promote the products and brands of both the acquiring and target companies at costs lower than the cumulative expenses they would face in independent market endeavors. It also entails harnessing the brand equity of one of the companies to propel the sales of the other company's products.

1.4 M&A process phases

M&A transactions do not constitute an event but rather a process that can be defined as that "complex of decisions and activities aimed at carrying out an extraordinary finance transaction"; it begins at the moment a potential investor decides to make an acquisition and ends with the finalization of the agreement with the counterparty. A key aspect of an M&A deal is the related preparatory period; the longer and more demanding this is, the more difficult and complex the deal will be. An acquisition that wants to be successful must first receive adequate strategic planning. The analysis involves careful consideration of the objectives to be achieved and the decision that is most consistent with them, in

²⁴ Gearing ratios are a group of financial metrics that compare shareholders' equity to company debt in various ways to assess the company's amount of leverage and financial stability. Gearing is a measure of how much of a company's operations are funded using debt versus the funding received from shareholders as equity.

order to achieve the creation of the greatest possible value; in this regard, awareness and evaluation of the distinctive competencies at one's disposal is essential.

In the first stage, therefore, particularly significant is the **strategic analysis** where the underlying rationale for the acquisition and the set objectives are investigated. It becomes necessary to draw up a solid *Business Plan* that, starting from a vision and mission, defines and plans the direction the company intends to take in the future (between 3 and 5 years), establishing the means and competitive advantages to be exploited to achieve the results within the planned timeframe. At the conclusion of this preparatory process there is the activity of research and identification of counterparties potentially interested in the transaction (*targeting*), which is carried out through the selection criteria dictated by the client, the experience of the person in charge of the transaction (*advisor*) and additional internal personal resources. The second phase consists of selection and evaluation activities in which the following assume particular importance:

- The **blind profile**: anonymous form sent to target companies, identified in the previous phase, to describe the opportunities in question along with a confidentiality agreement to be signed;
- The **information memorandum**: information document addressed to target companies that have expressed an interest in the prospective transaction and represents the potential buyer's first introduction to the company;
- **Non-Binding Offer**: the main contents of which are:
 - a. Structure of the deal;
 - b. Price;
 - c. Modalità di pagamento;
 - d. Guarantees;
 - e. Due diligence.

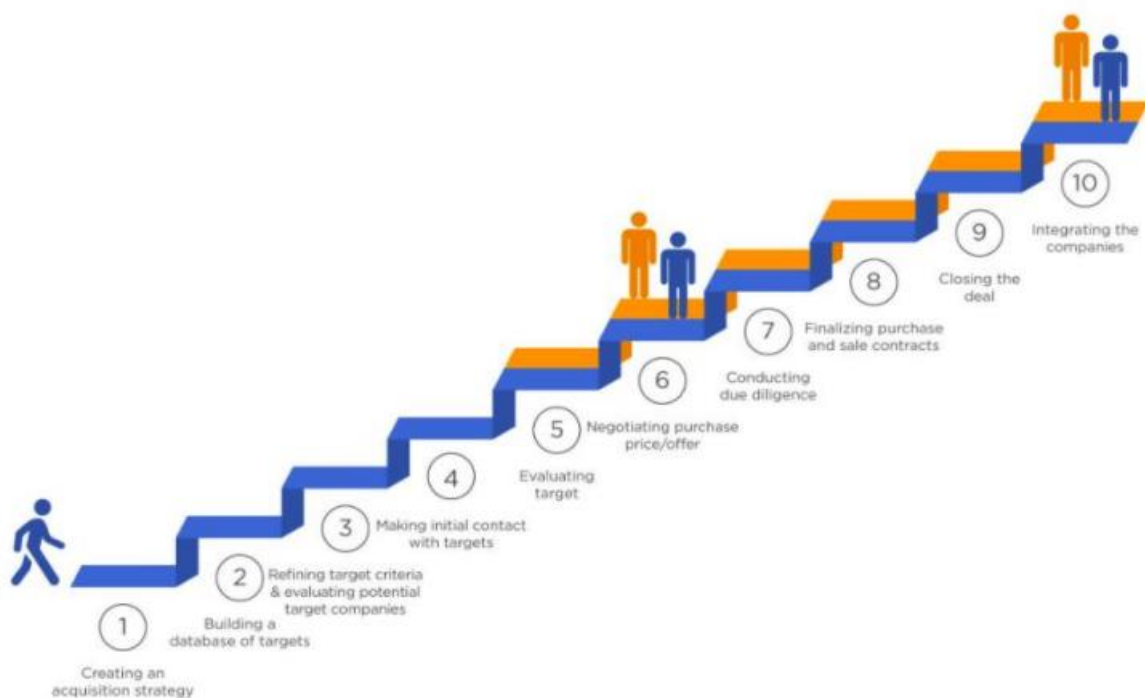
The next phase is devoted to **negotiation**, where negotiating skill, bargaining strength, the ability to make reliable estimates of the target company's value, and the substantial input of outside consultants and professionals come into play. From the negotiation phase, the most critical phase of the entire

process, one moves, if successful, to the **binding offer**; this is contained in a document where the buyer's binding commitment to acquire the target company is enshrined. Next, the definition and formalization of the purchase and sale agreement (*closing*) takes place.

Finally, the last phase the one related to the **post-transaction integration**, which is crucial to bring out the value of the synergies resulting from the union, assumes particular importance; it is a laborious process that requires dedication, time and energy as well as the involvement of the management of both companies in question. The critical factors in this phase are organizational capacity, leadership and the prevailing culture.

So, in conclusion, integration becomes one of the strategic imperatives of the acquirer and one or more "champions" of the process are identified, who push to complete the union with the acquired company, or the risk of having carried out a beautiful but unprofitable exercise in style is very high.

Figure 5: M&A process phases



Source: DealRoom.

1.5 Global Trends

1.5.1 Merger waves

An analysis of the number and value of mergers and acquisitions (M&A) transactions in recent decades allows us to delineate the fluctuations that have characterized the phenomenon internationally and domestically.

Longitudinal research on the cyclical nature of M&A processes has led to the formulation of the concept of merger waves (Gaughan, 2002) to denote the waves of M&A associated with shocks in the technological, economic, and institutional spheres that originated in the Anglo-Saxon world, due to the particular structure of markets, type of capitalism, and institutional set-up, and then spread globally. Since 1900 there have been six distinct merger waves, each with unique characteristics.

The *first wave* (1893 - 1904) termed merger for monopoly was characterized by the consolidation of firms in manufacturing and mining with the formation of large monopolies through horizontal mergers and industrial giants such as DuPont, General Electric, Eastman Kodak (Nelson, 1953).

The *second wave* (1919 - 1929) was characterized by a consolidation of the operations previously undertaken, aimed both at strengthening from oligopolies weakened during World War I (Stigler, 1950) and at developing operations of a vertical nature through which holding companies such as General Motors and IBM emerged.

The economic boom of the 1960s initiated the *third wave* (1960 - 1973), which was characterized by mergers of a predominantly conglomerate nature (Scherer, 1986) as a response to antitrust restrictions against those of a vertical and horizontal nature. The tendency to implement diversification strategies and create subsidiaries were the underlying determinants of the driven incrementalism of the 1970s (Rumelt et al, 1994; Weston and Weaver, 2001).

However, the poor performance of conglomerate operations initiated the hostile takeovers of the 1980s (Fray et al, 1985). In fact, in 1981, the *fourth wave* (1980 - 1990) began, characterized by hostile takeovers, the large size of target firms, the increased role of banks, more sophisticated strategies

undertaken by multinationals (Smith, 1991), the higher rate of leverage (extensive use of leverage), and the initiation of cross-border transactions.

Processes of deregulation, technological innovation and market integration led to the *fifth wave* in 1993 that ended in 2000. This wave featured not only U.S. companies but also European companies due to pressures from the EU implementation process. Domestic M&As between companies, with headquarters in the same country, were consistently joined by cross-border transactions involving companies of different nationalities and were characterized by a greater degree of complexity due to regulatory and cultural differences. In 1998, global M&A amounted to approximately \$2 trillion in terms of the stock value of announced transactions (Child et al., 2001). The total value of deals completed between 1998 and 2000 was about \$4 trillion, higher than the total value of deals completed in the previous 30 years (Henry, 2002). Of these, about 40 percent were cross-border in nature (Hitt et al, 2001 a, b) due to the impetus coming from the globalization of markets (Hitt et al., 2000; Hitt et al., 1998a), which gave rise to strong challenges, especially in the post-acquisition phase.

After a downward trend during the three years period 2001-2003, the phenomenon of mergers and acquisitions began to grow again from 2004, peaking in 2007 and then declining due to the great global crisis of 2009. The value of mergers and acquisitions in the *sixth wave* (2003 - 2009) is comparable to that of the fifth, as is the number of mega deals. This wave was characterized, however, by cross-border deals as a response to market integration, the need to consolidate core business by merging with competitors, the increased size of deals including through LBOs, the growing role of institutional investors, private equity firms (we will discuss this in later chapters), and the entry of players from emerging-development countries, such as PECO²⁵ and China, which had been left out of global competition in previous decades.

Apart from the six previously outlined M&A waves, a *seventh wave* can be identified from 2014 to 2019. This particular wave is characterized by a phase of economic expansion and the widespread integration of digital technologies. The seventh merger wave exhibits similarities with the preceding

²⁵ We refer by this expression to the new member (or acceding) countries of the European Union formerly belonging to the former Soviet bloc: Lithuania, Latvia, Estonia, Poland, Czech Republic, Slovak Republic, Hungary, Slovenia, Romania, and Bulgaria.

one, particularly in terms of the significant influence exerted by private equity on the overall volume and value of M&A transactions.

Figure 6: Global M&A Market 2010 - 2020: Countervalue by Geographical Target Area and Number of Completed Transactions



Source: KPMG, Report M&A, 2020

Furthermore, the seventh merger wave can be analyzed with a central focus on three key themes that underpin the escalating trend of these activities.

- **BRICS:** The acronym BRICS designates a critical factor contributing to the substantial upsurge in M&A operations. Comprising Brazil, Russia, India, China, and South Africa, these nations represent emerging global economies, encompassing developing countries as well as newly industrialized ones. This aspect rationalizes the pronounced concentration of M&A undertakings in these countries in the upcoming years, compounded by their status as some of the most populous nations worldwide. The success of M&A endeavors in these regions can be attributed to two primary factors. Firstly, there's a substantial concentration and potential within commercial activities. Secondly, the various trade and fiscal policies within these economies play a significant role. Acquirers in emerging markets often employ "non-conventional" integration strategies that resemble alliance management (Kale & Singh, 2012).

- **Mega-acquisitions:** In industries characterized by sluggish growth, such as consumer products, a trend of consolidation among significant firms is observable. This consolidation is driven by the pursuit of scale expansion, operational and market synergies, and tax advantages. The strength of the dollar and low financing costs have facilitated firms in raising capital for these substantial deals. Notably, the consumer goods and pharmaceutical sectors witnessed mega transactions at the outset of 2017.
- **Found Rates:** the Federal Found Rates corresponding to these years were notably low, facilitating the easy procurement of funds for merger endeavors. These monetary policies, also adopted by the European Central Bank (ECB), aimed to counteract the prolonged adverse impacts of the Global Financial Crisis and played a substantial role in revitalizing the M&A industry.

There exists a discernible pattern showcasing the resurgence of sizable M&A deals. However, this trajectory experienced a slowdown in 2020. As mentioned earlier, M&A waves constitute a cyclical phenomenon heavily influenced by market circumstances. External events can wield significant influence over the yearly trend and subsequently, the transaction volume. The advent of the Covid-19 pandemic led to a noticeable decline in M&A transactions during the first half of 2020. The global response to the pandemic, including widespread lockdown measures to curb its spread, caused activity levels to plummet to levels not observed since the Global Financial Crisis.

Figure 7: Mergers waves

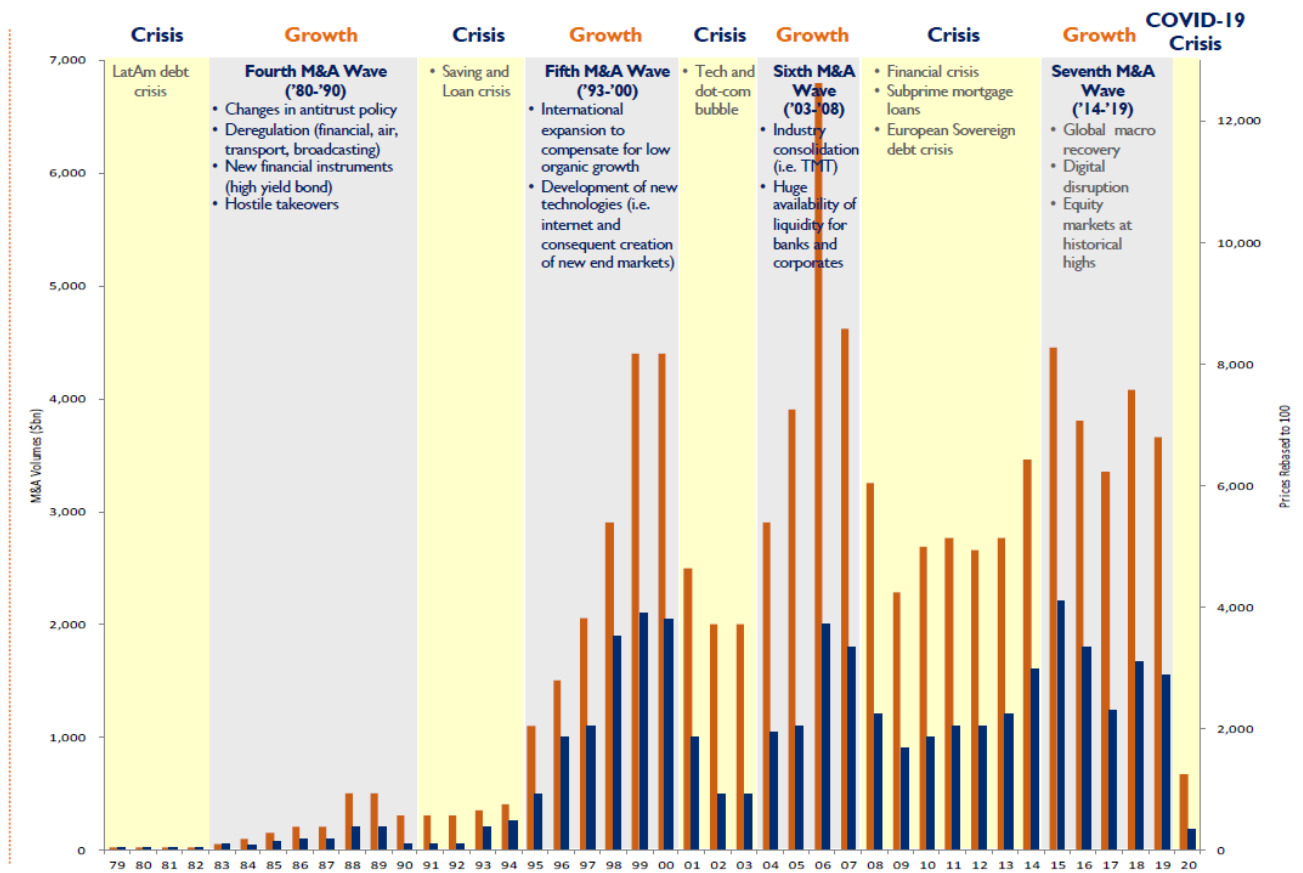
Year	Wave	Description
1893 – 1904	First Wave	Horizontal merger
1919 – 1929	Second Wave	Vertical Merger
1955 – 1973	Third Wave	Diversified conglomerate
19080 – 1990	Fourth Wave	Hostile Takeovers; LBO ²⁶

²⁶ Leveraged BuyOut (LBO) Technique of buying a stake (total or controlling) in a company, business, line of business, or group of assets (target), which has the characteristic of using debt to finance most of the purchase value.

1993 – 2000	Fifth Wave	Mega Deals; Cross-border mergers
2003 - 2008	Sixth Wave	Shareholders Activism; LBO
2014 - 2019	Seventh Wave	Economic Expansion; digitalization; return of mega-deals
From 2019	Eight Wave	Market Volatility; Spin off; Carve out

Source: Realized by the Author

Figure 8: Global M&A historical trends overview



Source: Dealogic

1.5.2 From Covid 19 to nowadays

In 2020, the market faced a period of crisis due to the global Covid-19 pandemic, which had impacts on the overall economy. According to a study conducted by Bain & Company²⁷, the global crisis triggered by the pandemic led the management of many companies to revise business portfolios to reevaluate their strategies. These revisions led companies to concentrate resources and funds in businesses with the highest growth potential and where they enjoyed a distinctive competitive advantage already built; reflected in a trend of strategic acquisitions motivated mostly by the opportunity to acquire know-how (mainly in the tech sector) to enhance existing capabilities and consolidate the competitive advantage already held. Business leaders have recognized the importance of acquiring these assets either through outright acquisitions or through joint ventures and strategic alliances. The strategy of focusing on existing competitive advantages had positive impacts on all those companies that were able to incorporate technology into their products and services during the pandemic.

Recent examples of such deals based on know-how and technology transactions include Panasonic's signing of a \$7.1 billion deal in April 2021 to acquire Blue Yonder Inc., a developer of enterprise supply chain management software, with the aim of strengthening Panasonic's portfolio and accelerating the companies' shared mission for autonomous supply chain, that of Walmart in the same year as MeMD, a telemedicine company, with the goal of furthering Walmart's omnichannel health delivery strategy, or Nike's acquisition of virtual sneaker and fashion start-up RTFKT, so to accelerate digital transformation and also be a leader in apparel in the metaverse. For these reasons, we can say how resilient M&A transactions have been to the pandemic, although this led to a sharp slowdown in early Q1 and Q2, but with a sharp recovery at the end of the year. In the end, corporate acquirers signed more than 28,500 agreements in 2020, totalling \$3.6 trillion. This was mainly due to the digitization process that allowed acquisition and merger transactions to be conducted virtually even if the world was in lockdown. In the entirety of 2020, there were significant drops in both the worth (decreased by 15%) and the quantity (decreased by 11%) when compared to the preceding year. Among different

²⁷Bain & Company, *Global M&A Report; As the world locked down and masked up, M&A endured*, 2021.

regions, the Americas experienced the most substantial decline at 25%. On the other hand, Asia-Pacific and Europe, the Middle East, and Africa displayed relatively better performance, with decreases in deal worth of 4% and 6% respectively, by the end of the year.

In 2021 the global M&A activity reached its all-time high, thanks to low interest rates implemented to combat the pandemic crisis, substantial liquidity in the market, and the vigorous endeavors of Private Equity (PE) firms. In 2021, global PE activity represented 27% of the total worldwide M&A activity in terms of value, and 9% in terms of the number of deals, marking a historic milestone in the proportion of sponsor-led dealmaking. Buoyed by the aforementioned factors, the PE sector witnessed an exchange of USD 1.5 trillion across 2,869 transactions. During the same year, there were a total of 2,120 buyouts amounting to USD 990.8 billion. The technology sector continued to fuel investor appetite, accounting for 470 deals valued at USD 225.7 billion. Additionally, the telecom and real estate sectors garnered significant attention, with investments of USD 69.6 billion and USD 37 billion respectively. Notably, the largest buyout deal of 2021 was KKR's acquisition of Telecom Italia for USD 40.1 billion in November. Exit valuations reached unprecedented heights, and the number of sponsor exits nearly doubled compared to the previous year, with a total of 1,245 exits valued at USD 800.1 billion recorded in 2021.

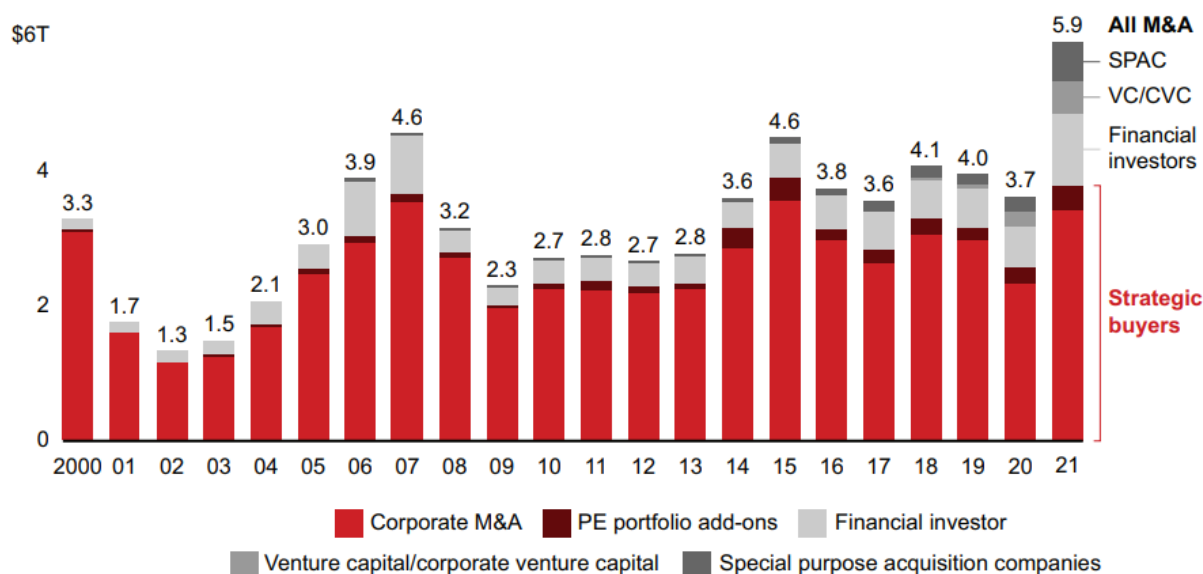
Figure 9: Financial Sponsor Buyouts



Source: Dealogic

The **total value of transactions** reached an unprecedented **\$5.9 trillion**. Some buyers were motivated by the abundance of available assets and the low cost of capital, while others engaged in the competition to match their peers' deal-making activities. Companies rushed to acquire both transformative capabilities and to expand significantly in a historic race for expansion. In contrast to the relatively straightforward deal market of two decades ago, which mainly consisted of corporate buyers and limited financial investor involvement, the current M&A landscape involves substantial participation not only from corporate buyers but also from add-on deals (where investors purchase and combine multiple foundational assets to achieve scale), financial investors, Special Purpose Acquisition Companies (SPACs), and Venture Capital (VC). SPACs are investment vehicles containing cash only, created to raise capital with the aim of acquiring or merging with unlisted companies while profiting from the transaction. The *SPAC* is financed at the outset by promoters who contribute venture capital to them. VC is a form of medium- to long-term investment in unlisted companies with high potential for development and growth (high-growth companies) that are in the start-up stage, carried out mainly by institutional investors to obtain a substantial capital gain from the sale of the stake acquired or from the stock market listing. These figures, along with PE companies will be analyzed in detail later in the discussion. While strategic buyers (including corporate buyers and private equity portfolio add-ons) saw total deal value increase by 47% year over year in 2021, these other types of M&A rose about twice as fast.

Figure 10: M&A deal Market value (in trillions of US dollars)²⁸



Source: Bain, *Global M&A Report*, 2022

In the realm of strategic mergers and acquisitions (M&A), certain sectors are experiencing significant growth compared to others. Notably, Tech assets are thriving independently from the broader M&A market. The median multiples enterprise value/EBITDA has surged to 25 times in the tech sector. This trend can be partially attributed to the widespread necessity of digital capabilities, essential for maintaining competitiveness across various industries. Similarly, the healthcare sector has witnessed a considerable rise in asset prices, with median multiples reaching 20 times. Both in the technology and healthcare sectors, buyers are showing a willingness to invest a premium for assets that possess high-profit margins and substantial growth potential.

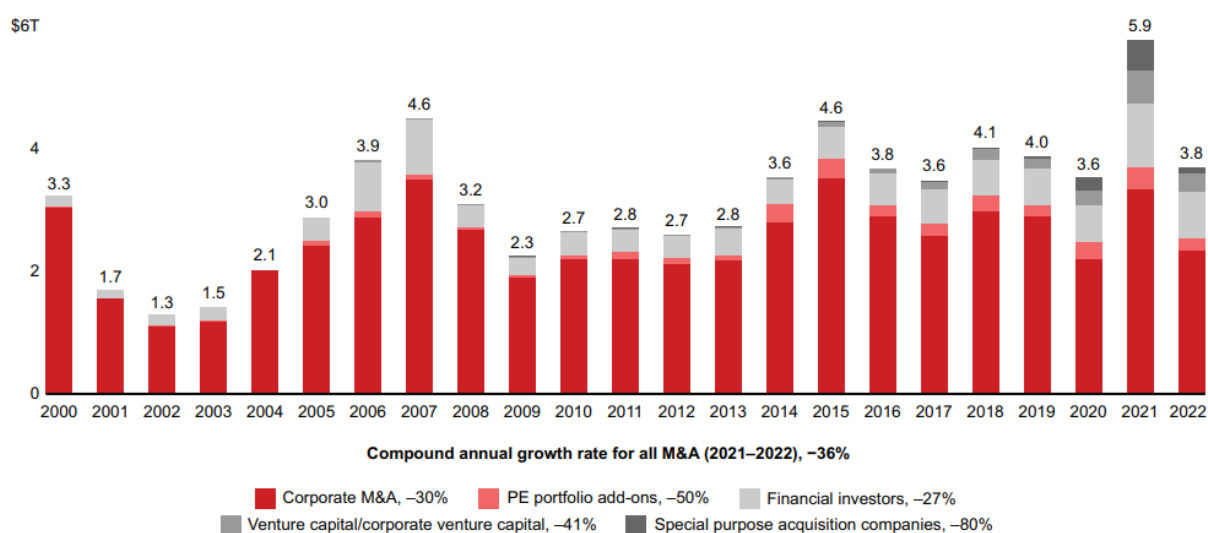
If 2021 saw a surge in M&A activity, 2022 was not a good year for the global M&A market, with volume (- 17%) and value (- 37%) declining due to concerns about a generalized recession, rising interest rates, inflationary pressures, and uncertainty related to the Russia-Ukraine war's progress. Due to changing inflation and uncertainty surrounding interest rates, businesses found it challenging to

²⁸ Strategic deals include both corporate M&A and PE portfolio add-ons; categorizations based on deal technique, industry, and acquirer business description.

assess acquisition prospects and estimate M&A deal costs. As a result, the M&A market started to slow down last year. Despite this, according to EY surveys, businesses are still keen to close agreements, although on a lower scale. Global mergers and acquisitions fell by 38.8% from 2021's record-breaking USD 5.9trn to USD 3.8trn in 2022. Deal value this year is 9.3% lower when compared to the pre-pandemic five-year average (2015–19), before the easy-money policies that followed Covid's start of turbocharged dealmaking in 2H20 and 2021.

All the above data can be expressed in *Figure 11* which highlights the M&A deal market value (in trillions of US dollars).

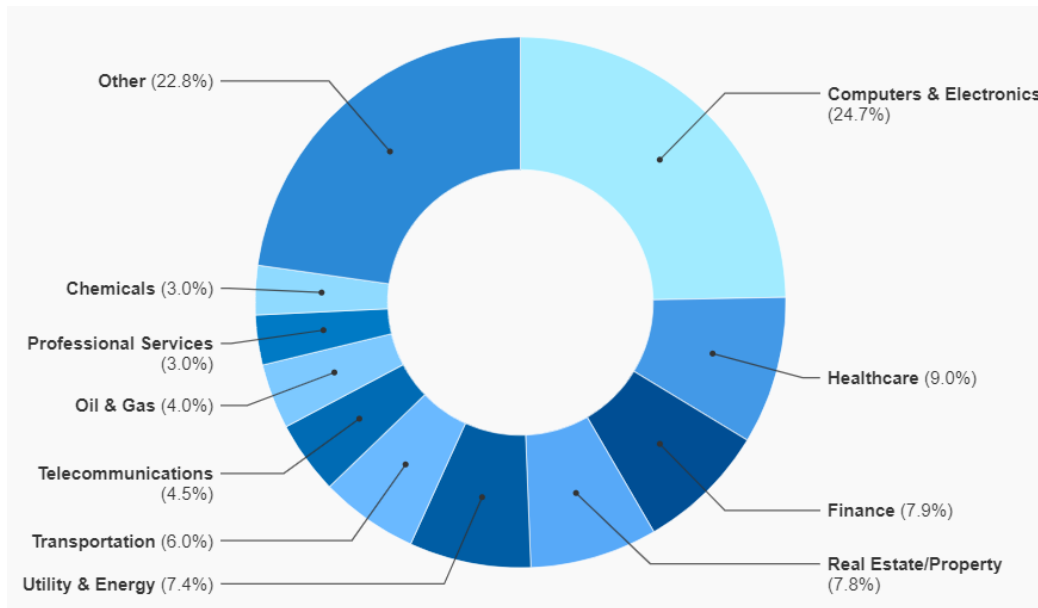
Figure 11: M&A deal market value (in trillions of US dollars).



Source: Bain, *Global M&A Report*, 2023

With over 20% of all agreements in 2022 coming from the **technology sector**, M&A will continue to be dominated by this industry. Although there is presently an absence of activity in this industry, this year we expect M&A, collaboration, and strategic partnerships to be more heavily focused on data use, solutions for cybersecurity, efficiency in operations, and quicker transactions. Large firms from various industries aiming to improve their IT products, as well as financially sound tech enterprises, are prepared to benefit.

Figure 12: Global M&A by sector (2022)



Source: Dealogic

A large-scale M&A resurgence this year is expected to be muted through at least the first half due to increasing volatility, higher costs of financing, political instability, and recessionary pressures. Technology is helping CEOs to make better choices and to digitally alter their companies. As corporate and PE firms strive to buy new enterprises or maybe leave them in order to maximize profits, the disruptive impact of AI on businesses and the economy will generate M&A possibilities. The rising skills gap encountered by companies pursuing acquisition strategies has been evident for some time. Competition has increased in this area as well because of AI, where AI talent is one of the scarcest resources to find. Other areas are also undergoing transformation. Companies are pursuing net-zero methods and trying to lessen their environmental effect. In some industries, the energy shift is causing enormous instability, and there are chances for M&A along the way. For example, mining businesses are being bought by automotive and industrial OEMs to guarantee the supply of vital minerals required for the manufacture of batteries and energy storage.

The drivers for 2023 will be²⁹:

²⁹ PwC, *Global M&A Industry Trends:2023*, mid-term update.

- *Strong Corporate*: Corporate financial balances continue to be in general good shape. Strong corporations are anticipated to seek highly advantageous and significant transactions to position themselves for the future.
- *Increased mid-cap activity*: Expect consolidation, including share-for-share transactions, driven by the demand for size and balance sheet stability. Given lower valuation levels, there is a strong amount of private equity interest in public to private mergers, and when valuations stabilize, pressure on boards to entertain alluring cash offers grows.
- *Asset Disposals*: As the emphasis on core companies grows and balance sheet structures are improved, expect to see more non-core disposals through asset sales, spin-offs, and carve outs.

Spin-off refers to the division of an existing or recently founded enterprise from another, over which the latter has a significant influence in terms of skills, know-how, and activities carried out. Through the equity **carve-out**, the *parent company* transfers a minority (fluctuating less than 20%) or majority (fluctuating at least 80%) share of a *subsidiary* to a newly formed corporate entity. In this scenario, the parent company gains a significant amount of strategic direction power while the *target business unit* gains a greater level of autonomy. Nevertheless, the **sell-off** occurs with the sell-off, along with a complete change in the subsidiary's ownership and a payment in the form of shares or *cash*.

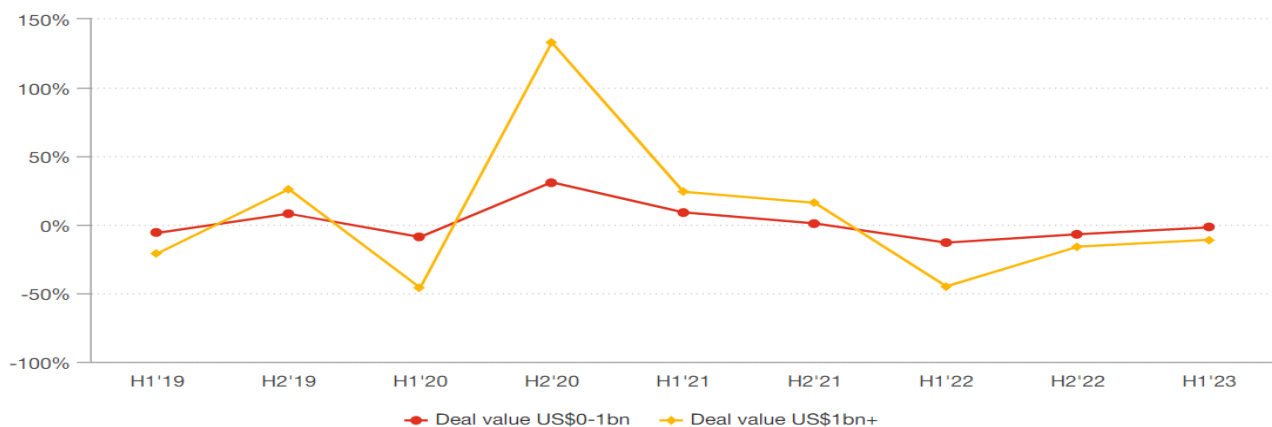
- *Activism*: As activists look for chances to earn outsized gains in a volatile market, activism levels will stay high.
- *Cash-Rich Middle East*: Middle Eastern businesses will keep making investments abroad to diversify their exposure away from the oil sector and toward sectors like telecoms and technology.
- *Regionalization*: As corporations try to further localize crucial suppliers, regionalization of supply chains, which has been accelerated by the Russia-Ukraine war, China, and other geopolitical challenges, will boost M&A activity.
- *Regulatory Scrutiny*: Across the board, regulatory scrutiny of M&A transactions is increasing, which raises process barriers and lengthens deal timelines.

- *Financial Sponsor*: Deals requiring greater equity will result from financing volatility, which will affect sponsor-led M&A activity. Infra funds will continue to fuel more activity. Leverage in current portfolio companies will have an impact on activity in the form of minority deals, consolidation of synergistic assets within PE portfolios, and restructuring transactions.

Global M&A volumes and values decreased by 4% and 12%, respectively, during the first half of 2023 (H1'23), from already low levels in the second half of 2022 (H2'22). The decreases were 9% and 39% when compared to the first half of 2022, respectively. As various macroeconomic and other factors came into play, overall M&A activity was unequal among countries and territories, which presented chances for investors ready to pursue expansion in other areas.

The most active industry for dealmaking in H1'23 was the technology, media, and telecoms (TMT) sector, which accounted for almost 26% of all global deal activity. But when it came to deal values, the energy, utilities, and resources (EU&R) and industrial manufacturing and automotive (IM&A) sectors took the lead with 25% and 21%, respectively. The EU&R sector's 21% share of the total transaction value (on just 9% of deal volumes) shows how investment financing is still flowing into the industry. Significant investments in the energy transition made by businesses as they strive to meet their net zero emissions targets have attracted investors to the sector. Companies are increasingly integrating the acquisition of innovative **start-ups** into their strategy, capable of being true **game changers** in the near future.

Figure 13: Percentage change in global deal volume, H1'19 – H1'23



Source PwC, *Global and Italian M&A Industry Trends 2023 Mid-Year update*, 2023.

Chapter 2: The Start-ups' world

2.1 Definition of Start-ups

The phenomenon of start-ups is one of the major worldwide trends that has recently attracted significant attention and garnered enormous relevance. It's important to realize that there isn't one complete explanation for this kind of business when using the term "start-up." Therefore, considering several ways to interpret this idea could be a useful first step. A start-up is generally understood to be the beginning of a new commercial activity that is defined by significant innovation and rapid growth goals. According to Paul Graham, a venture capitalist and co-founder of the well-known start-up accelerator and seed funding organization known as "Y Combinator":

“a start-up is a company designed to grow fast”.

In this instance, growth is emphasized as a particularly important component of these kinds of businesses. Bob Dorf, a renowned expert on start-ups, and Steve Blank, an entrepreneur lauded for implementing the customer development approach and leading the lean start-up movement, assert that:

“a start-up is a temporary organization designed to search for a repeatable and scalable business model, working under conditions of extreme uncertainty”³⁰.

This statement highlights the transient nature of the start-up status and the fact that it is a stage in the development of a firm. Furthermore, the term "**repeatable and scalable business model**" relates to the goals of these organizations to create an innovative business model that can be utilized concerning new products and markets in order to achieve continuous expansion. Furthermore, this statement makes clear that "**uncertainty**" is an intrinsic characteristic of start-ups, acting as a factor that directly affects their value, viability, and sustainability. However, starting a new business entails a range of challenges. Not all small, emerging firms are able to grow without failing, broaden their horizons, or establish themselves as industry leaders. These factors contribute to the start-up process' inherent complexity.

³⁰ Blank, S., Dorf, B, *The Start-ups Owner's Manual: The Step by-Step Guide for Building a Great Company*, K&S Ranch, Inc, 2014

According to a more technical definition, an innovative start-up is a capital company, which can also be constituted in the form of a cooperative, which has as its social object the development, production and marketing of innovative products or services of technological value. By its nature, the typical start-up tends to be a low-cost operation, with initial funding from the founders or their friends and families. Finally, it could be helpful to remember the following definition, which is comprehensive and includes most of the points mentioned above, which is the following:

“a start-up company is an entrepreneurial venture which is typically a newly emerged, fast-growing business that aims to meet a marketplace need by developing a viable business model around an innovative product, service, process or a platform. A start-up is usually a company designed to effectively develop and validate a scalable business model”. (Sivitska, Y., 2018)³¹

2.1.1 Business and financial characteristics

After reviewing several meanings of the phrase "start-up," it is feasible to condense the key components from both an economic and financial perspective. From a business perspective, it may be claimed that start-ups have six essential traits in common:

1. **New Business Model:** start-ups are businesses seeking a business model, as was previously stated in one of the explanations given. This implies that they work to create new business models that allow them to capture the value of customers and convert it into money for the firm instead of using those that have already been established and embraced by traditional enterprises. It is accompanied by the Business Plan which is a document aimed at representing in perspective the business development project, with the intention to assess its feasibility - in relation to both the business structure in which this project fits, and the context in which the proposing company operates - and to analyse the possible repercussions on the main business choices and its economic and financial results. To this goal, a business plan must contain all the information necessary to:

³¹ Sivitska, Y. *Features of valuation of startup companies*, Consulting Forex, 2018.

- Know the characteristics of the reference company;
- Illustrate the contents of the project that you intend to realize;
- Demonstrate its feasibility, i.e. the pursuit of the established objectives;
- Analyse all its possible repercussions on the company³².

It meets 5 requirements:

- Define the product system (what you intend to produce, deliver and sell);
- Outline the market segment (customers to whom you intend to sell);
- Identify the corporate structure suited to production and sales;
- Describe the communication policy that conveys its image to customers and contributes to the formation and maintenance of a positive reputation of the company with them;
- Term the funding policy and specify who will support the initiative financially.

2. **Repeatability:** a business model is repeatable when the start-up can offer consumers its product or service with no inventory cap regardless of demand and with little need for customization and adaptation (De Oliveira, F. B., Zotes, L. P., 2018)³³. This indicates that the company can repeat its business strategy across a range of regions and timeframes without generating substantial changes.

3. **Scalability:** another adjective that needs to be related to start-up business models is scalable. A business model is scalable when it allows the company to change size by growing exponentially using few resources. Indeed, as we have analysed, start-ups are usually characterized by a limited amount of resources. That is why the real challenge for these young companies is to expand in a short time and to be able to multiply, in an exponential way, the audience to which they relate, attracting the most new customers;

³² Bnl, *Guida alla Redazione del Business Plan*, available at www.bnl.it.

³³ De Oliveira, F. B., Zotes, L. P., *Valuation methodologies for business startups: a bibliographical study and survey*, Brazilian Journal of Operations & Production Management, 2018.

4. **Innovation:** these types of businesses are characterized by their inherent ability to innovate, creating new goods and services that either meet the needs of existing customers or generate entirely new ones. This phenomenon has become more widespread in all areas with a high technological content, are fast-paced, and have a high investment intensity in R&D. The tech industry stands out among them for the reasons mentioned above, followed by ICT, life science, automotive, finance (start-up fintech), aerospace, and most recently, anything related to the web 3 (Metaverse, NFT, AI, VR).

5. **Uncertainty:** if it is true that all businesses face an uncertain future, start-ups face an even greater degree of uncertainty. In fact, start-ups operate in a highly uncertain environment because, despite the market analysis, financial viability, and working viability that led to the formation of such businesses, they lack certainty regarding the project's success and the customer's acceptance (De Oliveira, F. B., Zotes, L. P., 2018).

6. **Temporary nature:** A start-up can be defined as a real stage of starting the business. This stage is very delicate for the company, as it is the first phase of its life cycle and defines its ability to become, in the future, a large enterprise; the duration of this phase depends on many factors but what is certain is that no start-up is intended to stay a startup forever.

It is possible to state that all start-ups create negative economic outcomes which are often defined by negative net earnings, when it comes to their financial features. This is due to the simple fact that start-ups first must test their products and services, as well as their business strategy, and make them known to consumers. Therefore, the amount of revenue produced is often much less than the number of fixed expenses. There isn't a perfect financial structure for start-ups, although there are several pro-tempore structures that may be more or less suitable. It is crucial to maintain a dynamic balance between different sources of funding, and all financial choices should be made in this direction. In truth, selecting the appropriate debt-to-equity ratio depends greatly on the strategic character of the company. It implies that there must be a connection between the company's financial structure and the degree of risk that results from its commercial activities (Donna, G., 1996). Since implementing a financial structure with a sizable portion of debt increases financial risk, it is a strategy better suited for companies operating in mature industries with lower operational risk. It's more appropriate for companies with high growth potential operating in fast-moving industries with high levels of

operational risk, such as start-ups, using primarily equity. However, achieving a high degree of financial elasticity is crucial during the start-up phase of a business. For this, the creation of credit balances can be very helpful because the chances that something unexpected or different from what is foreseen in the financial plans is truly plausible as planning with no company history as recommendations get complicated, especially in fast-growing industries that depend on variables that are uncontrollable and unpredictable by the company. A suitable combination of funding sources can also contribute to reducing financing costs. In fact, in scenarios marked by rapid growth, a well-balanced expansion can be achieved by introducing equity, thus mitigating the financial risk associated with excessive and rapid expansion, which can lead to unfavourable consequences such as heightened expectations for returns and, consequently, a higher cost of capital. For start-up companies, a substantial presence of equity can be viewed not only as a necessary choice due to the challenges in obtaining bank financing, primarily due to limited collateral, low liquidity, and significant information asymmetry between entrepreneurs and investors, but also as a favourable position for these firms when facing unfavourable financial outcomes. This is because a significant level of capitalization allows them to absorb losses, preventing situations of failure. (Cosh, A., Cumming, D., Hughes, A., 2009)³⁴. On one hand, debt can accelerate a company's immediate growth, but on the other hand, it constrains its future expansion potential. As the leverage ratio increases, future self-financing cannot be allocated to fuel growth because it must be canalized into servicing existing debt.

2.2 The main stages of the start-up's lifecycle

Start-ups must follow a specific path and carry out a specific set of tasks in order to transform their initial idea into a successful company. Although the term "start-up" alludes to a time of transition in an organization's lifecycle, even start-ups can have a defined lifecycle with several stages.

The first phase called **Pre-seed** is the initial phase in which the start-up consists only of a business idea that is about to move its first steps. At this stage, the project is still in an embryonic stage, and it is necessary to devote itself to the development and perfection of the idea and the business model. In Pre-seed it is of considerable importance to focus on the definition of the target clientele and to identify

³⁴ Cosh, A., Cumming, D., Hughes, A., *Outside Entrepreneurial Capital*, The economic journal, 2009.

customers with a specific problem or need that the business idea can solve. The study of consumer segments is fundamental, such analysis must be as accurate as possible as the company must capture the tastes and needs of its consumers, in order to offer them and the market the best possible product. Pre-seed is a delicate phase for developers, as it is characterized by considerable difficulty in finding sources of funding (on average the capital contribution is between 30,000 and 50,000), as few people will be willing to invest in projects not yet started and at high risk of failure. Given the criticality of finding funds, this phase is also called “bootstrap”, as often the only funding comes from the entrepreneur’s savings or the so-called FFFs, that is, Family, Friends and Fools who are willing to finance the start-up on trust. Occasionally funds are raised through public facilitated funding initiatives or incubators.³⁵.

Next, we have the **Seed phase**, where the project begins to be implemented and you have the first developments of the business idea. After passing the targeting phase, and having found the existence of a market where you can operate, you have to work on the definition of the business plan and refine the idea to develop a MVP (Minimum Viable Product), that is, a minimum marketable product.

According to E. Ries, start-ups must apply and repeat the three simple stages of build, measure and learn. It starts with the creation of a “minimum viable product”, which will subsequently be improved based on feedback received from the target market. In this way, the company demonstrates the great importance it attaches to its customers and minimizes market risks. From the simplicity of the structure of this procedure derives the term “Lean Start-up”. The start-up will need initial structural funding to finance the business idea through the elaboration of the product/service, the development of a business plan and the conduct of the market analysis. The average investment ranges between 200 and 500 thousand euros, but since there is not yet a structured business plan, only those operators who have sufficient knowledge (technical and specialized in the field in question) to fully understand the validity

³⁵ The term incubator refers to an institution that interacts with potential entrepreneurs, offering services and sometimes financial resources, with the aim of encouraging and supporting the start-up of new forms of enterprise. (...) Incubators are generally presented as a physical space where start-ups can find all the equipment and assistance, they need to get their business idea off the ground. The explosion of the new economy has shifted the identification of such operators from the 'physical' to the 'virtual' level, which offers all the ingredients needed to create new businesses: space, consultancy, networks, financial resources, and professional expertise. (AIFI , *Guida al Venture Capital*.)

and good prospects of the project join the family investment. These are business angels³⁶, incubators or specialized Venture Capital funds. The risk at this stage is very high.

The **start-up phase** consists in the beginning of the production activity when a tested product already exists but whose commercial validity is still to be proven. There is an entrepreneurial organization, characterized by informal relations between individuals and the absence of bureaucracy. Any completion/perfection of the product are made, the strategy of the company is defined, and the first commercial feedback is obtained. At this stage in order to be able to develop your company you need enormous financial resources to support the productive activity of the various business functions and to carry out operations such as the launch of new products or other necessary marketing initiatives. Along with the progressive recognition by the market, the interest and willingness of investors to acquire venture capital shares increases. Venture Capital funds invest between 1 and 5 million euros on average at this stage. It enters a crucial phase for the continuity of the start-up, where it meets the greatest criticalities in the implementation and implementation of the business idea and its encounter with the market: 75% of them do not pass this stage, which has therefore been called “Death Valley”³⁷.

We also talk about the **first stage** regarding participation in the very first phase of development, if the start of the production activity is already completed, but you still have to fully validate the commercial validity of the product offered. The business, of a modest size, seeks funds to finance its growth and its consolidation which, for various reasons, is not appropriate to find in the form of debt capital. For the investor it is easier to evaluate the business, having already completed the phases of ideation, design, experimentation and start of the production activity. Therefore, even the most “generalist” operators, who do not have special experience and knowledge of the business in question, can take part in the financing at this stage, based on the market analysis and the commercial potential that they find in the business.

³⁶ They are professionals who have experience in the sector because they have already worked in it or are still active in it and intend to invest in a high-risk, high-return sector. Business angels offer their knowledge and expertise and concretely help start-ups develop their idea, acting as advisors and mentors to new entrepreneurs. They are mainly interested in start-ups in their early stages and can grant up to approximately EUR 200,000. IBAN (Italian Business Angel Network) definition.

³⁷ According to the CBI Insights report, 'The Top 20 Reasons Start-ups Fail', November 2019, out of a sample of 101 failed start-ups, the main causes that each indicated for failure are: lack of Product Market Fit (42%), lack of funding (29%), an inadequate team (23%), competition (19%).

The growth and development phase can be divided into early growth and sustained growth, it then follows the real expansion phase to finally reach maturity or listing on the Stock Exchange.

In the **early growth phase**, we are still working on the business model, the marketing plan and the strategy, with the aim of consolidating the business activity and acquiring new loyal customers, laying the foundations for a greater expansion. When the company manages to consolidate its track record, consisting of a user base, 30 constant figures on revenue and a concrete validation of the market, then the institutional investors provide the so-called financing, or round, of series A and series B. The first generally ranges between 3 and 10 million euros, the second between 10 and 20 million euros, all depending on which industry your business is in. Series A funding is generally aimed at the launch of new by-products, and the development of new distribution channels, and therefore falls into the category of investments in support of early growth. Series B funding is intended to replicate on a large scale the results achieved until then, expanding the activity beyond its traditional boundaries, and increasing the company's market share, to achieve what is called **sustained growth**. The company that aspires to Serie B financing must demonstrate to potential investors both that it can succeed in the international market and that it has not yet reached the peak of its growth. Generally, therefore, they are enterprises that have reached medium sizes and aim to consolidate or improve their competitive position, whose growth prospects are high, certain and sustainable. With the obtaining of the Series B funding, you technically move from the start-up to the scale-up phase³⁸.

When the company starts to grow at a sustained pace, we talk about **expansion stages**. The investments in this phase are called expansion financing, or development finance, and are provided mainly by private equity funds, hedge funds and investment banks, or Venture Capital funds that have already supported rounds A and B (and whose capital contributions at this stage are therefore called round C, D and so on). At this point, in fact, the enterprise transits to its real maturity phase, in which it will obtain the maximum economic results, being able to produce profits with its operational activity. The products or services that the company market is affirmed and known on the market, and the customer base is loyal and satisfied. At this stage, since the experience of the entrepreneur is not sufficient, the

³⁸ The scale-up is an innovative company that has already developed its product and business model, operates in the market and has certain successful characteristics that enable it to aspire to international growth.

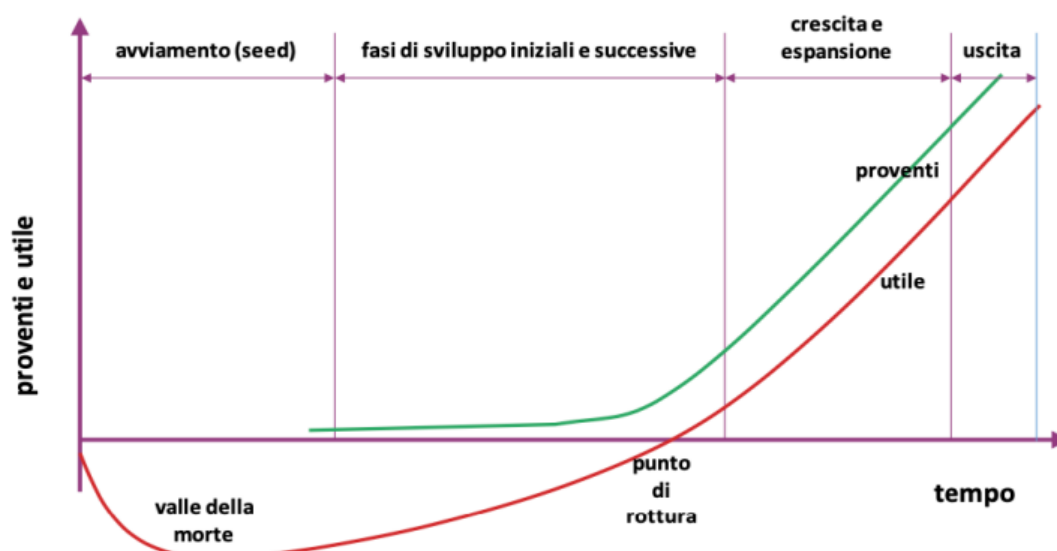
management will be assisted by third parties, such as consultants and investors, who have an interest in the positive development of the company. Expansion financing operations are carried out by the subscription of a capital increase or a convertible bond loan, aimed at the acquisition of a minority share in the company. The amount of investment at this stage is enormous: It generally ranges between EUR 10 million and EUR 50 million, but it may result in even higher figures. During development, the private equity provider does not exercise control over the company, which remains in the hands of the majority shareholder (typically, the entrepreneur himself). Therefore, it is used to talk about a real partnership between a Private Equity operator and an entrepreneur.

Finally, when the company is already consolidated but wants to resort to the help of the institutional investor to perfect its development projects, we talk about the **maturity phase** or listing on the stock exchange. When the development objective is directly connected to the will to reach the critical mass necessary to deal with the listing process in the Stock Exchange in the short term, we are talking precisely of bridge financing or pre-IPO (Initial Public Offer)³⁹: a real financing “bridge” between the status of a closed-capital company and that of a listed company. Private equity investors are attracted to this type of investment because, having confidence in the potential of the business, they believe that the value of the company will grow as a result of the planned development, allowing it to have a substantial capital gain in the event of dismissal of the stake. However, developing investments can be more complex for the financial operator than those at the start-up stage, due to the greater number of stakeholders involved as shareholders, the presence of a past business history, and an already structured organization.

The final phase of a start-up is the exit phase, in which it becomes a real company and represents the moment when investors begin to exit from the young firm. It is usually considered the ultimate goal of a startup as it is the time when both founding partners and investors can maximize their profits thanks to the collection of surplus value, i.e., the monetization of the company's value increase. The de-investment strategies will be analyzed later in the next paragraph.

³⁹ An initial public offering (IPO) refers to the process of offering shares of a private corporation to the public in a new stock issuance. An IPO allows a company to raise capital from public investors. It will be explained deeply in the next paragraphs.

Figure 14: Start-up phases and evolution of revenues and profits



Source European Court of Auditors, 2019

2.3 Main actors in start-up financing

As seen above, the financing needs of the enterprise change according to the phases of its life cycle, under the double financial and strategic profile. For this reason, the intervention of the specialized operator must have very different characteristics between the stages, in order to respond adequately to the changing needs of the enterprise. At each stage of the company's development, which corresponds to specific and heterogeneous size, profitability, requirements and prospects, a different intervention of the institutional investor is necessary, especially in terms of different combinations of the two key variables, capital and know-how. Venture capital interventions by institutional investors can therefore be classified into three macro-categories:⁴⁰:

- **Early stage financing:** within this category are all the interventions aimed at supporting the birth of a new entrepreneurial initiative, from the embryonic phase to the first marketing. Financial problems represent one of the important aspects not only in the start-up phase, but also in the early stages of development, with the financial criticalities that any enterprise faces

⁴⁰ AIFI classification

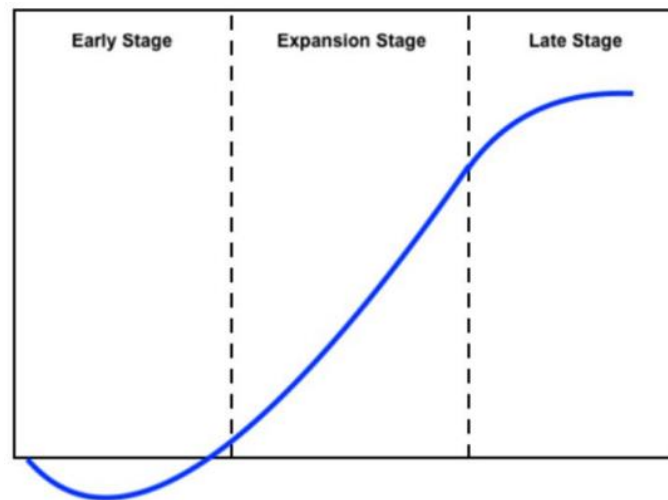
until it is able to trigger virtuous circles of self-financing. What the neo manager needs most during the start of the business is therefore, in addition to an adequate capital contribution, support in terms of managerial, corporate and entrepreneurial skills, to be able to define a formula that has prospects for success in the market, especially with about the correct identification of its competitive position. It is important to stress that in this context the investor must necessarily have confidence in the potential of the business and the people who will run it.

- **Expansion stage financing:** The birth phase follows the true growth phase, in which the company is experiencing a moment of strong expansion. In the course of this development, the company starts by reaching the break-even point and recording the first profits, then targeting the growth of profits and the acquisition of a wider market share. The organizational structure evolves and, along with the growth of the customer base and the production activity, the number of employees, the procedures and the degree of formalization increase. There is still a need for substantial external funding, intended to support the size growth and development of the company and its reputation, but, since the activity has already begun, a part of the funds is beginning to be recovered through self-financing. The company is no longer fully exposed to the dynamics of the markets, the time horizon of the investments is narrowing and the risk of the same decreases. Even at this stage, however, the contribution of the institutional partner is not exhausted in financial support, but is necessary its managerial, strategic and advisory support, in order to properly direct the development of the company and its subsequent industrialization; The network of national and international knowledge that this partner has also becomes extremely valuable.
- **Late stage financing:** The third macro-category of venture capital investments concerns those situations of the maturity phase of the enterprise's life cycle in which the presence of the institutional investor becomes necessary to "reflect" or revitalize the business. To overcome the moment of stall, internal changes are made which, although they may be more or less drastic, generally change the ownership of the organization. In this last stage, start-ups prefer to get new funds that have no dilution effect on equity but since getting access to bank loans is too expensive, they rely on hybrid forms of investment which are typically the mezzanine

capital and the bridge loans. Mezzanine capital allows the company to get new funds while providing investors with a portion of the profits if the project turns out to be successful (Dec, P., Masiukiewicz, P., 2017). Bridge loans are short-term loans that are issued to reach sooner short-run goals or in preparation for a future IPO (Morghen, P., 2021). As a matter of fact, the final phase of the start-up funding cycle aligns with shareholders selling their shares, whether through acquisition by other firms, initial public offerings (IPOs), or leveraged buyouts (LBOs).

The first category refers to the proper activity of Venture Capital⁴¹, while the second and third to the Private Equity, although the funds of venture capital are very active also in the second phase, especially with regard to the so-called early growth.

Figure 15 Funding cycle of a start-up



Source: Goldberg, R.T *An Introduction to Start-up Financing and a New Approach to Attracting Capital Resources*, StartupFactory LLC, 2012.

⁴¹ It is important to make a terminological clarification, as the concept of institutional investment in venture capital has in the past taken on different connotations between the US and Europe. According to the US definition, private equity identifies the totality of venture capital investment activities by institutional investors; within the Private Equity species, a distinction is made between Venture Capital (financing the start-up and development phases of a new business) and buyout (financing the change phase of an already established business). In Europe, on the other hand, a distinction has traditionally been made between Venture Capital activity, concerning the earliest phases of a company's life (generically, the start-up phase), and Private Equity activity, referring to investments concerning the later phases (of development and change). Following a process of methodological and lexical standardisation, Europe and Italy have also adhered to the US definition, so that Private Equity is the term used to indicate, in a general way, the activity of the venture capitalist. Gervasoni, A. e Sattin F.L., *Private equity e venture capital. Manuale di investimento nel capitale di rischio*, Guerini e Associati, 2008.

2.3.1 Venture Capital Funds

One of the main players in financing start-ups is venture capital funds. The term Venture Capital (VC) refers to the **institutional investment**⁴² activity in venture capital **of unlisted companies**, generally in the start-up phase, **characterized by a high potential for development and growth, to obtain a significant capital gain** through the sale of the acquired shareholding or the listing on the stock exchange. Venture Capital's activity, however, is not exhausted in the contribution of venture capital, but includes the presence of the venture capitalist⁴³ within the company more or less marked, in order to contribute to growth by participating in the definition of strategies, conducting financial advice, bringing valuable professional experiences, monitoring and supervising the decision-making process, and at the same time leaving the operational management to the company management.

The acquisition of the shares has, therefore, a contingent and transitional duration, as the intention of the buyer/venture capitalist is to promote a disinvestment of the own shares subsequently and in a medium-long time frame, to realize a substantial capital gain. In order for this to be possible, the share must undergo a considerable increase in value between the time of the investment and the disinvestment. For this reason, the business to which the Venture Capitalist directs its attention presents very high growth opportunities, found mainly in companies with high technological content (so-called "high tech") or that can demonstrate that they can exploit the discontinuities created by radical innovations, through the identification of macro-trends or critical success factors.

The high levels of returns associated with these business categories are accompanied by equally high risks, therefore, the Venture Capitalist must carefully select the most attractive investment opportunities, carrying out a verification of the growth prospects and feasibility of the development plan. The risks the venture capitalists have to bear are mainly related to the rapid obsolescence of the product or service offered, its failure to commercial success and the risk of the need for refinancing. The overall risk of the investment is dramatically amplified by the inability to mobilize the invested

⁴² The institutional investor is the economic operator that continuously and professionally exercises the activity of investing, in securities or real estate, significant financial resources, the fruit of collection from communities, often very large, of savers. This category includes insurance companies, investment and merchant banks, mutual funds, pension funds, hedge funds, asset management companies, and public social security bodies. Laura Ziani, *Dizionario di Economia e Finanza*, 2012.

⁴³ Venture capitalists are those operators active in the market that are generically defined as such regardless of the type of operation

capital before the planned size of growth is reached. For these reasons, Venture Capitalists develop diversified portfolios of several young companies within a single fund, within the limits of the fund's portfolio eligibility fees (qualifying portfolio undertakings)⁴⁴.

The differences with other forms of funding can be linked to three important factors:

1. *assumption of enterprise risk*, which is manifested precisely in the material acquisition of shares within the share capital. In fact, with the conclusion of this transaction, the buyer ends up achieving the qualification of an entrepreneurial partner, financing, among other things, a partnership and a project whose outcome and whose horizon is not said to be certain and defined;
2. *financial support coupled with management support for the funded enterprise*. The activity of the venture capitalist is not an aseptic provision of capital, but it is a contribution that is also adapted to the human, professional and managerial profile; The venture capitalist provides a real consulting activity with financial and managerial support to the social partnership. The venture capitalist brings ideas, incentives, experience, contacts, relationships and is an intermediary actively involved in the management of the companies it finances;
3. *the ownership of capital is temporary and generally minority*. Although the venture capitalist is limited to the purchase of shares, its objective is not the acquisition of control but to give the enterprise that liquidity and that management contribution necessary so that the company itself can increase its value exponentially and allow the Venture capitalist to realize a significant surplus value coming from the subsequent dismissal of the shares. It is, in short, a completely transient activity where, already from the genetic stages, the exit moment is programmed and planned. This means that, despite having a shareholding in venture capital, financing ends up crystallizing, anyway, like a financial intermediation operation. The activity ends with the disinvestment of the shares, which results in a rotation of the share portfolio.

There is often confusion with the figure of the **Business Angel**, which differs from the VC fund in terms of money and timing of investments. These funds provide start-ups with money in the very last

⁴⁴ Regulation (EU) No 346/2013 of the European Parliament and of the Council.

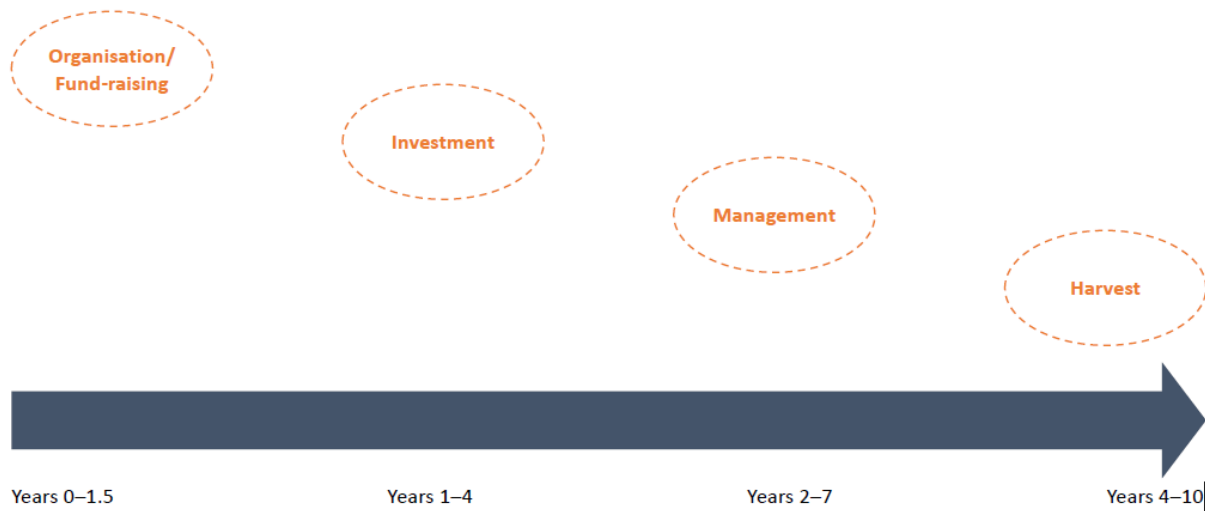
moments of the early stage, meaning when the firm looks for a Series A round; they keep on investing in start-ups also with Series B, C and beyond rounds, providing impressive amounts of money. It is possible to claim that venture capital funds and business angels are not alternatives, but they complement each other. This type of investor usually acquires a minority stake and invests in sectors in which he has previously operated as a manager, freelancer, or entrepreneur, and therefore knows well of their characteristics and opportunities. He offers the company, in addition to financial support, also his management skills, technical and operational knowledge, and a well-established and extensive network of relations with the economic and financial world. The Business Angel can support the entrepreneur according to two different approaches: participating actively in management with their own know-how and their own managerial and professional skills (so-called **Industrial Business Angels**) or opting for a marginal involvement in the management activity and choosing to carry out mainly the activities of supervision and control, thus acting as a simple facilitator of the business (so-called **Financial Business Angels**). However, It should be noted the Business Angel usually has an interest in monetizing, within a medium-term time horizon (3-5 years), a significant surplus value at the time of departure in both cases. Business Angels, therefore, carry out exactly the same activity as Venture Capital funds, but the amount and duration of the investment is reduced as they are informal private investors. Business angels invest their own money, whereas venture capitalists invest money that is not directly held but that they are asked to manage financially. Due to this distinction, business angels have a considerably stronger sense of emotional commitment than venture capital firms, which place a greater emphasis on objective results (Fairchild, R., 2011). In line with this, there is a significant difference between venture capitalists and business angels when it comes to the contract of the deal: the latter requires clarity and accuracy regarding the terms and conditions of the contract from the beginning, whereas the former tends to be more flexible when defining the terms of the agreement and allows for changes along the way.

2.3.2 Private Equity

VC funds are flanked by **PE** firms, again with the objective of filling the gap left by institutional providers of debt capital, providing companies with high growth potential with the necessary capital, in a medium- to long-term investment perspective, aimed at achieving a capital gain on divestment.

These are **operators that invest in the equity of unlisted companies** or conduct buyouts of public companies that result in a delisting of public equity. The provision of capital repayable only in the long run by specialised operators, makes it possible to cope better with the most delicate moments in the life of a company, such as, for instance, the implementation of strategies, development plans, new products or new technologies. These are situations where the investment is risky but the prospects for business growth are very high. Capital for PE is raised mainly from institutional investors (pension funds; insurance companies) and is used to expand the circulation, finance acquisitions, strengthen the financial structure of the company, carry out generational transitions or other critical processes of the corporate life cycle. In all these delicate situations, the support of the institutional investor is not exhausted in the financial aspect but is enriched with another component equally necessary and valuable for the enterprise: **strategic and managerial support**. In fact, in addition to providing venture capital, the specialized operator of Private Equity provides its know-how, experience and knowledge to help the company its development goals through the creation of a realistic growth plan over of 3-5 years. He supports external growth through contacts, investments, collaborations and more, with entrepreneurs in the same or other sectors. Usually, he also has a lot of experience in accompanying the quotation and can be helpful in defining the timing and optimal internal procedures. The specialized operator therefore configures itself as a strategic shareholder, but he doesn't run the business. The investment in Private Equity is made through the purchase or subscription of shares or shares of capital, or convertible bonds or other equivalent instruments. If the company you invested in is successful, the institutional investor's exit is when it has achieved the planned development through sale or IPO, and this phase is called harvest. The reward earned from management when they add value is one of the primary motivators for PE funds. Investors in PE funds typically anticipate a 100% return over an average of 7-8 years.

Figure 16 Typical Stages of a Private Equity Fund



Source: Cendrowski, H., Petro, L.W., Martin, J.P., Wadecki, A.A., *Private Equity: History, Governance, and Operations*, Wiley Finance, 2012

In the case of a radical change in the ownership of the company, it is generally referred to as a buy-out operation. This more drastic requirement can arise from a multitude of factors, among which:

- The mere willingness of the business group to liquidate the activity carried out, or a branch thereof, ceding it in full;
- The absence of a successor in the case of generational transmission;
- Privatisation (the process by which public administrations, central or local, transfer a business activity from the public sphere to the private sphere).

In these situations, the objective of the institutional investor is to support the enterprise financially and to help with the change of ownership. Simultaneously with the investment, therefore, there is a change in the controlling stock structure that is normally acquired by the Private Equity operator (or by a set of operators), with all the consequences and responsibilities that this entails. However, despite being in fact the majority shareholder, the operator of Private Equity does not perform the role of operational management, which is left to the management team, but its role is as always that of strategic direction, development support, monitoring and evaluation of results.

Regarding the management team that takes over operational and management control, it is possible to distinguish between *management buy-out* (MBO), in case the management group was already operational within the company; management buy-in, in case it comes from outside; *buying-in management Buy-out* (BIMBO), in case the group has a mixed origin. We also talk about *employee or worker buyout* (EBO or WBO) if the new ownership structure provides for the participation of a larger company of employees of the company, or family buy-out (FBO) if the management control is assumed by a part of the family interested in the continuation of the business activity that, in order to do so, records the shares of the other family members.

In the **reverse buy-out**, you have a buyout operation called “reverse” because it consists of offering to the public or private persons the sale of shares of a previously returned private company after a listing experience on the market that has not given the expected results. In order to carry out this operation, the institutional investor must first privatise the listed company, purchasing the securities available on the market (we talk about “venture purchase of quoted shares” or “public to private”) in such a quantity to perform the so-called *delisting*, that is, precisely, the company’s exit from the list of companies in the market. Secondly, the institutional partner must prepare the company for its next sale or listing on the stock exchange, using its know-how, experience and skills so that, this time, the transaction gives the desired results.

Leveraged buy-out refers to any acquisition of companies or corporate assets made by resorting to the capital of third parties (usually banking institutions) and limiting the financial contribution of the buyer, in terms of venture capital, to a limited part of the price paid: a debt-funded acquisition. These operations simultaneously cause two major changes for the target company: the change of ownership (buy-out) and the restructuring of all liabilities of the company being assigned (leveraged). The operations of LBO can be schematized in a sequence of phases⁴⁵:

1. The establishment of a vehicle company (*newco*), in which some investors (internal or external to the target investment), supported by an institutional investor, pay sums of money as equity.

⁴⁵ Schematisation by Borsa Italiana, available at <https://www.borsaitaliana.it/notizie/sotto-la-lente/leveragebuyout.htm>.

This amount represents only a small part of the amount necessary for the acquisition of the target company;

2. One or more financial companies shall grant capital to the vehicle company for an amount sufficient to cover the remaining part necessary for the acquisition. This funding, given that it is provided to a company with no operating structure, is typically not guaranteed;
3. Having raised the necessary capital, the vehicle company proceeds to the merger by incorporation of the target company, resulting in the incorporated company, (the most frequent event), or the acquisition of the shares of the same (not so frequently).

As a result of the merger, the funding provided to the vehicle company will become part of the liabilities of the target company, drastically increasing its degree of indebtedness. Therefore, an essential condition is that the target company is characterized by a low degree of financial leverage and a high ability to produce abundant and constant cash flows, precisely because the new company, born from the incorporation, will have to be able to repay the debt used for the acquisition. This debt will be, at the end of the transaction, secured by the target's activities and its ability to produce positive cash flows. For these reasons, the ideal LBO target company should present several characteristics to be able to bear a large amount of debt:

- a. little or no debt to begin with;
- b. be able to produce steady and predictable cash flows in order to service interest payments and reduce debt;
- c. have a strong market position and management team;
- d. limited CAPEX and NWC requirements;
- e. large amount of tangible assets for loan collateral enables lower-interest financing;
- f. divestible assets provide the acquirers with extra means to raise cash to pay off the debt.

With these characteristics, the company target is a good candidate. However, we have to perform several stress tests to take into account all possible scenarios.

2.4 Disinvestment Strategy

As was previously said, the final stage for start-ups with organized and effective business models is exit. The term exit refers to the moment when a significant change in the ownership structure of the company happens. **Disinvestment consists in the total or partial transfer of the shareholding held by the investor/entrepreneur**, who, in some cases, may also decide to retain a minimum share of capital in the more durable enterprise. So, the disinvestment phase is an extremely delicate phase that determines the actual achievement of the capital gain, the fundamental motivation of the entire investment process and the ultimate end of the investor in Private Equity, or its failure and the failure of the whole operation.

In the divestiture of previously acquired participations, two aspects are of major importance on which the venture capitalist and the other partners must absolutely agree: the identification of the most opportune moment to realise the disinvestment (timing of the transaction) and the definition of the most appropriate disinvestment channel (exit modality). With regard to the timing of the disinvestment transaction, it is important to remember that this is defined in the negotiations. This does not mean, of course, that the parties agree on a certain date, but simply that they are both aware and agree that, after a certain period, consistent with the duration of the operation put in place and congruent with the growth objective set, the institutional partner will be given the opportunity to liquidate its investment, according to predefined modalities. The actual time of liquidation and the method chosen will then depend on market conditions at the time of disinvestment and on the results achieved in terms of increasing the value of the company. In addition, it is necessary to take into account the impact on the company of the exit of the fund from the company. The achievement of the financial objective by the investor must be well combined with several factors but also with the company's ability to continue its own development path. The analysis of some cases has revealed the causes of failures or more frequent problems, related to the investment process. These factors can be summarized as follows:

- The limited appreciation of the participation by the stock market;
- The low interest in the securities by institutional investors in an IPO operation;
- Low interest from potential industrial buyers in the event of trade sale;
- The lack of cooperation between management and co-investors;

- Reduced corporate performance.

Prevention of these problems is possible thanks to careful planning of the entire investment process but very important is also an analysis of the conditions of the enterprise. The approach of a venture capital investor to the disinvestment problem is also influenced by other factors, including his/her ability to evaluate technologies and people and to make interpersonal contacts. It is therefore a broad set of elements that can have a strong impact on the choice of timing and manner of divestment. Late-stage start-ups have various strategies they can employ to exit⁴⁶:

- **Trade Sale:** the transfer of the share to an industrial partner. This path opens up a development perspective for the company since the buyer can be another business group interested in developing its own business area by realizing operational and strategic synergies. One of the most significant disadvantages of the trade room may be the disappointment of the management, fearing to lose its independence as a result of the change of the company's heads;
- **Replacement and *Secondary Buy Out*:** it is the transfer of the share to another operator of Private Equity or Venture Capital. We speak of replacement when we refer to the mere replacement of minority shareholders, whose departure generally does not involve major changes at the level of corporate strategy. If the assigned share is of control, the term secondary buy out is used. The main difference with trade sale transactions lies in the nature of the buyer. In fact, in this case, the buyer is not an industrial company, but an institutional investor: not only the strategic incentive is lacking (and the resulting higher price that the industrial buyer is willing to pay), but also the institutional buyer will tend to pay the participation the lowest price possible, so that the investment is as profitable as possible, achieving high levels of IRR (Internal Rate of Return). Secondary buy-out operations take place exactly like buy-out operations, with the difference that both parties are a Private Equity fund;
- **IPO:** For private equity operators, the preferred route to divestment is the listing of the investee company's securities on a regulated market. Primary offers are called initial public offerings (IPOs), secondary offers are called offer for sale. Admission to the official list is not an easy

⁴⁶ AIFI Classification,

process and is time consuming and expensive; therefore, one must be reasonably certain that the transaction will be successful. Borsa Italiana defines IPO as a particular type of public offer for sale or subscription aimed at admission to listing on a regulated market. More specifically, the IPO is the instrument through which a company obtains the diffusion of its securities among the public (the so-called creation of the free float), which is a necessary requirement for obtaining the listing of its securities on a regulated market. Since the IPO is addressed to the indistinct public of investors, it constitutes a case of solicitation of investment. The company must follow all necessary rules in order to ensure transparent information to the recipients of the offer. The IPO procedure takes four to six months, and includes a series of alternating phases of planning, *due diligence*, drafting of the mandatory listing documents, listing, formation of the underwriting syndicate, marketing activities, road shows, *bookbuilding*⁴⁷, actual placement and trading. Generally, a company relies on one or more investment banks to file for an IPO and this bank (or these banks) takes the name of underwriter. The underwriter is in charge of setting up the offering price of company shares and selling these shares to a pool of selected investors, with whom it usually has a relationship. This is initially determined based on parameters such as the price-earnings ratio of the company, its main competitors and cash flow forecasts. Subsequently, this price is adjusted downwards in consideration of the underwriters' spread and underpricing⁴⁸. The spread is the difference between the price at which the underwriter buys the shares from the issuer and the price at which they are resold to the public. The spread is therefore the percentage gain that the underwriters demand, which is generally 7%. There are several reasons for the preference of the institutional partner, the other partners and the entrepreneur for the IPO solution, although it can be time consuming and expensive. First of all, listing on a regulated market gives the venture capitalist the opportunity to realise a capital gain by liquidating his shares at a higher price (a condition highly dependent

⁴⁷ Book Building is the process by which an underwriter determines the price at which the shares must be sold in an Initial Public Offer

⁴⁸ A typical phenomenon in IPOs and offer for sale that occurs when the placement price is lower than the market price of the securities at the time of listing. Companies may consciously choose this type of approach in order to provide an incentive for investors to take up the offer, or to encourage maximum circulation of the securities among a wide public, or because of the existence of significant information asymmetries between the participants in the transaction. The discount is usually fixed at around 10% but may be influenced by the necessity to own the stock, and the existence/inexistence of alternative investments.

on the market) than the price at which he had acquired the stake. Once it has been verified that market conditions are optimal at the time of listing, and that a sufficiently satisfactory capital gain can be realised for the institutional investor, there are a number of other advantages from which both that investor and the company can benefit. The shares can be immediately liquidated, but a part of them can be kept in the portfolio to realise a further gain from the post-listing increase in value, with the remaining shares then being disposed of in one lump sum or in a gradual form, depending on one's beliefs about the price trend.

The IPO process also often meets with the favour of the entrepreneur and management, because it allows them to retain control of the company while obtaining a number of financial and operational benefits. Among the former, the most decisive is certainly the possibility of raising low cost liquidity on the market, facilitating new share issues and thus expanding the business. Moreover, as a result of the company's increased capitalisation, it improves its debt ratio and obtains the possibility of financial restructuring and, consequently, can raise debt capital on more advantageous terms. In addition, it is used to speak of stock currency to indicate the fact that, as a result of the IPO, the company acquires a new currency in the form of its own shares, which can be used as an actual payment for, for example, merger or acquisition transactions, limiting the use of capital. Moreover, due to the many formal obligations that companies have to comply with in order to access the market, the listing is a kind of certificate of trustworthiness, thanks to which the company acquires greater credibility in the eyes of banks and other financiers. In fact, as a result of a successful listing, they can gain great benefits in terms of reputation, gaining more visibility, more consideration and more trust from the financial environment. We have already discussed the importance for a specialised Private Equity operator of its ability to have a successful track record, attracting both more investors to its fund and more funding requests from companies (deal flow creation). As far as the company is concerned, its success on the stock exchange leads to an improvement in its image and credibility, not only towards its subscribers, but also towards customers, suppliers and any partners who are not necessarily subscribers of the company's securities. However, listing on the stock exchange also has its downsides. It exposes the company to a dilution of control from the original owners and to a great deal of scrutiny by supervisory authorities, resulting in huge

costs for the company. Indeed, the costs of IPOs are many, both with regard to direct costs, such as administrative and bureaucratic costs, legal and advisory costs, and with regard to indirect costs, such as spread and underpricing costs;

- **Buy Back:** it's the repurchase of the participation by the original partner. Another possibility of disinvestment consists in the repurchase of the participation by the original shareholder. This mechanism, which obviously entails a large financial commitment on the part of this party, is often used by the activation of *put option* clauses (activation is carried out by the institutional investor) or *call option* clauses (activation is carried out by the entrepreneur). These clauses provide for parameters defining the transfer price of the participation. The most frequent cases of buy-back can be traced back to situations of company development that do not allow its listing on the stock exchange;
- **Write Off:** it consists in the write-off of the participation following its complete or partial loss of value. This is not a true disinvestment mode, because it does not contain any discretionary element on the part of the institutional investor, but it is brought within this scope because it determines the cancellation or reduction of the value of the participation in the balance sheet of the specialised operator, effectively determining the end of the investment's life cycle.
- **M&A**⁴⁹.

The choice between disinvestment channels depends firstly on the type of the target company and its characteristics in terms of size, business sector and organisational and operational features. Secondly, this choice depends on the results achieved through the collaboration between investor and entrepreneur. Third, many cyclical elements must be taken into account, such as stock market or merger & acquisition market conditions. Finally, the specific wishes and preferences of all shareholders are also part of the assessments made.

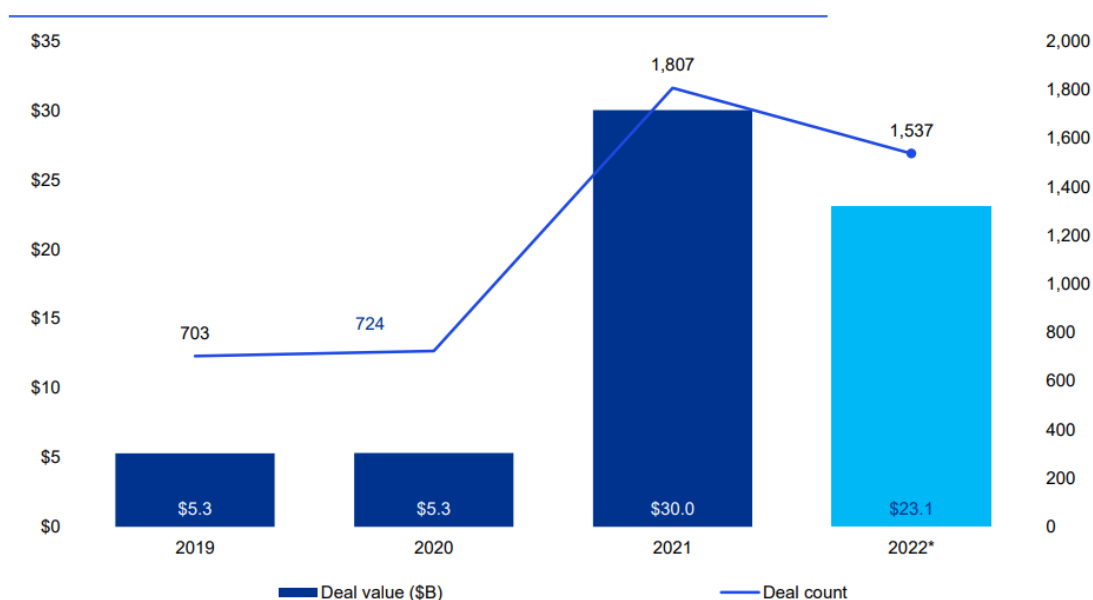
⁴⁹ See Chapter 1: What is an M&A transaction and how does it create value.

Chapter 3: The disruptive impact of Blockchain in the market

3.1 Main Blockchain aspects

Thus far, blockchain technology, like Distributed Ledger Technologies, is becoming increasingly important in the financial and other sectors, catalysing a great deal of attention and investment towards it. Suffice it to say that 2021 was a blockbuster year for cryptocurrencies and blockchain as well, with \$30 billion in investments globally, surpassing the previous high of \$8.2 billion set in 2018 and increasing by more than five times the \$5.5 billion in investments recorded in 2020.

Figure 17: Total global investment activity (VC, PE, and M&A) in blockchain and cryptocurrency



Source: KPMG International, *Pulse of Fintech H2'22*; *Global Analysis of Investment in Fintech, 2022*

However, in 2022, the cryptocurrency space witnessed a significant decrease in investment following the crash of Terra (Luna) in May. Investors became more cautious as they sought to comprehend the aftermath and the potential consequences on centralized trading platforms and associated businesses. Concerns were further heightened by the bankruptcy of the \$32.5 billion cryptocurrency exchange, FTX, in November.

In his original Bitcoin white paper titled *A Peer-To-Peer Electronic Cash System*, Satoshi Nakamoto defined a digital coin, Bitcoin, as "*a chain of digital signatures*," which is famously known as the "*blockchain*." The blockchain enables each owner of a coin to directly transfer currency to any other party within the same network without requiring the involvement of a financial institution to facilitate the transaction. Initially, the concept of blockchain was conceived in relation to Bitcoin as a digital currency. However, this technology has applications far beyond Bitcoin and the financial sector. It can serve as a public ledger for various types of transactions, not limited to digital currencies. A **blockchain** is essentially a **shared** and **immutable database that simplifies the process of recording and tracking information in a shared environment**. It's important to note that blockchain is a technology that establishes trust in an environment that may not inherently be trustworthy (Clavin et al., 2020). It falls under the category of Distributed Ledger Technology (**DLT**), which enables **secure, transparent, and immutable** storage of data on a network of interconnected computers referred to as nodes. This technology allows for the creation of a digital record of transactions or other data types, which are organized into blocks and linked together in chronological order, hence the name blockchain.

At the core of the Blockchain lies the concept of recording transactions within a Ledger, a tool quite similar to a master ledger. Blockchain is part of the Distributed Ledger Technology (DLT) family, which is defined by the Bank for International Settlements (BIS) as:

“Processes and related technologies that allow nodes in a network to propose, validate, and securely record state changes (or updates) in a synchronized ledger distributed among network nodes” (BIS, 2017)

In other words, Distributed Ledger Technology enables a network composed of equally significant actors (nodes) to manage a synchronized ledger among all participants, utilizing encryption, and without the necessity of a centralized node for management and control. DLTs are, therefore, computer protocols that employ a shared, distributed, simultaneously accessible, and architecturally decentralized ledger based on cryptographic principles. This enables the recording, validation, updating, and storage of data that is verifiable by each participant, unalterable, and immutable (Cascinelli, Bernasconi, Monaco, 2019). This shift moves from a centralized architecture where all

data is stored in a single database to a decentralized peer-to-peer architecture. This means that each participant possesses a copy of the same data, which is distributed across different databases.

Blockchain differs from other DLTs by identifying specific protocols in which the evolution of data within the ledger is managed through block structures, all cryptographically linked to one another, ensuring that every node in the network holds a complete copy of the ledger containing all transactions carried out by participants. It is possible to add new blocks of information, but the removal or alteration of previously added blocks in the chain is not allowed. Each block must undergo a consensus mechanism before it can be authorized to enter the blockchain. Going into more detail, we can represent the blockchain as a database in which various blocks are interconnected, ensuring that every transaction on the network must be verified and initiated by the network itself. Transactions are considered valid only when their candidate block becomes a confirmed block and is added to the blockchain. The connection between the blocks is established through a cryptographic function known as a **hash function**, which can be defined as a digital identity or digital fingerprint used to map data of arbitrary size into fixed-size data. In other words, the hash is a mathematical function that converts any text string, regardless of its length, into an alphanumeric code with specific characteristics, including a predefined number of characters. It's important to note that with the hash function, the same input always produces the same output, and even a minor alteration in the input will result in a noticeable change in the function's output (Hosp, 2019).

Returning to the structure of blockchains, for each new block generated, the hash belonging to the previous block is included in the input to generate the hash of the new block. Therefore, each new block contains information, data, and the hash of the previous block. Consequently, if there is an attempt to add, remove, or modify information in any block of the chain, it would alter the hash of that specific block and all subsequent hashes, immediately revealing the attempt at modification. To assess the current state of a blockchain, it is not necessary to analyse the entire chain's contents; it is sufficient to verify the hash belonging to the last block (Antonopoulos, Masutti, 2019).

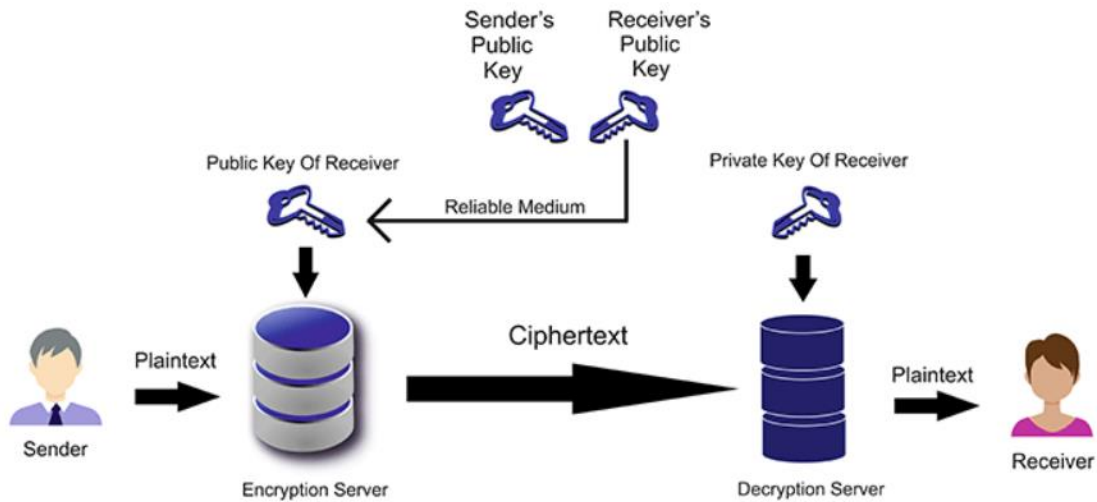
One of the primary purposes of blockchain technology is to enable anyone to conduct transactions without the need for a central institution. Hence, there is a clear need to reach an agreement on the correct state of the blockchain, deciding and identifying which transactions have actually occurred and in what order. This is where the so-called **consensus algorithms** come into play: mechanisms that

enable consensus to be reached among the various versions of the ledger, even though they are updated independently by network participants, making the transaction immutable and verifiable by each of them, as it is validated and recorded in the ledger, each client holding a copy. Consensus is a general agreement among members of a given group (represented by the nodes of the blockchain), seen as an ongoing process involving all the various participants, each of whom has a share of decision-making power and responsibilities. Satoshi Nakamoto himself introduced one of the fundamental pillars of the Bitcoin blockchain: the decentralized mechanism of emerging consensus, where the term "emerging" refers to the fact that consensus is not explicitly reached but is achieved through the asynchronous interaction of thousands of independent nodes. To better understand this aspect, it is necessary to grasp how a transaction is generated and when it can be considered valid (Antonopoulos, Masutti, 2019).

The primary requirement for executing a transaction on a blockchain is ownership of the object of the transaction, thus necessitating the demonstration of actual ownership of the object in question. This is made possible through digital signatures. This tool is created through a combination of hashing and public-key cryptography. Assets within a blockchain are not linked to a person but to a specific address. For this reason, possessing the private keys of an address translates into the ability to access the assets associated with it. Therefore, the sender signs a transaction with their private key and, by applying the hashing function, ensures its integrity. Once created, the transaction is broadcast to neighbouring nodes responsible for verifying its validity and, if approved, propagating it further within the system. Indeed, every transaction must undergo this verification process to be included in a block and thereby recorded immutably within the blockchain (Garavaglia, 2018).

In summary, initially, the message to be transmitted is subjected to the hashing function, and subsequently, the resulting string and the initial information are digitally signed with the sender's private key. Once the entire package reaches the recipient, they decrypt it using their own public key, calculate the hash of the received message, and compare it with the hash included in the transmitted set. This process endows the system with three properties: authentication, integrity, and non-repudiation, and is defined as asymmetric cryptography.

Figure 18: Asymmetric Cryptography



Source: Cyberment

"**Miners**" play a crucial role in the consensus mechanism. To add each new block of transactions to the blockchain, it is essential to ensure its control, validation, and encryption. To achieve these objectives, whenever a block is formed, a complex mathematical problem needs to be solved, which demands a substantial commitment, particularly in terms of computational power. This process, known as **mining**, is carried out by miners. In detail, a miner is responsible for several functions. Firstly, they must ensure the validity of transactions by verifying if the amount or object being transferred is genuinely available, that the transaction has been signed with the correct private key, and that there are no double-spending issues. Once the validity of the transactions is confirmed, each miner selects the desired ones and collects them into a block, known as a candidate block. Subsequently, they share this block with the rest of the network, which then validates it. Conversely, if a miner creates a block recognized as invalid, other nodes on the network will reject it (Garavaglia, 2018). Whenever a miner's block is added to the blockchain, they receive a reward, most often represented by transaction fees associated with the block's transactions.

Once these points are clarified, we can discuss the two main consensus algorithms implemented:

- **Proof of Work (PoW):** This algorithm is used to confirm transactions and produce new blocks in the chain, utilizing what was previously explained in mining. At the core of this system, we

find complex mathematical problems and the simple need to prove the solution. As the network expands, the problems gradually become more intricate, and the algorithm requires greater computational power to solve them. However, these puzzles should strike a balance, not overly complex, as that would result in prolonged block generation times, leading to transaction processing delays and network stagnation. Conversely, if the problem lacks a well-defined resolution timeframe, generating new blocks would become virtually impossible. On the other hand, if the problem were overly simplistic, it would render the network highly susceptible to external attacks. Once a miner successfully solves the problem, a new block is created, and transactions are incorporated into it (Sayeed & Gisbert, 2019). In the event of an attempted attack on a blockchain, the attacker would need to consume an extensive amount of computational power, invest significant time, and incur exceedingly high costs (Bentov, Gabizon, and Mizrahi, 2016). However, the high energy consumption is the price to be paid to reap the benefits in terms of immutability. Another weakness of Proof of Work lies in its difficulty to scale the system, evident in the slowness of transactions and the high fees demanded, considered responsible for hindering the widespread adoption and application of blockchain on a large scale.

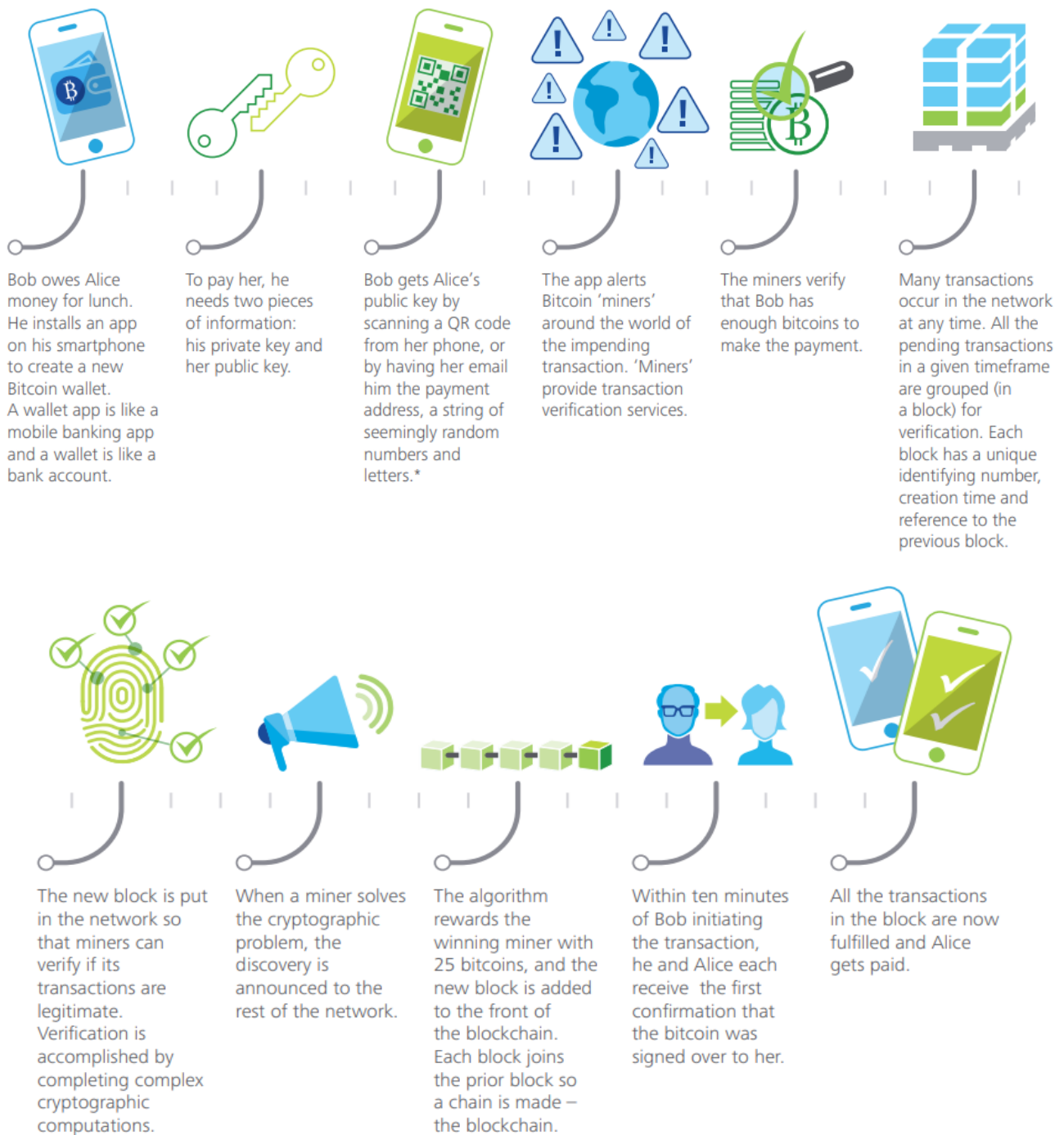
- **Proof of Stake (PoS):** It serves the same purpose as Proof of Work but with a completely different process, where certain actors known as "validators" play a fundamental role. Unlike traditional Proof of Work, the addition of new blocks to the chain is referred to as "forging," and users who want to participate in the forging process (the aforementioned validators) must temporarily lock a specific amount of coins (tokens) within the network, referred to as "stake." Participants can lock cryptocurrencies in staking, and the protocol will randomly assign one of them the right to validate the next block in order to receive transaction fees. Typically, the probability of being chosen is proportional to the amount of coins you possess: the more coins you have, the higher the chances of validating the next block. They receive compensation in the form of cryptocurrencies when they successfully validate a block, and it becomes part of the blockchain. However, if they fail to verify it correctly, their participation will be adversely affected, potentially resulting in the loss of some or all of their coins. Since there is no incentive to engage in dishonesty or attempt theft of currency, this process is inherently more secure

(Reaume, 2022). One criticism directed at PoS is that it tends to favour large holders who, by having more cryptocurrencies staked, are selected more frequently to validate blocks and earn incentives. However, the size of the stake serves as an incentive to perform the validation work correctly and consistently. The higher the stake, the greater the risk of losing it when validation errors occur.

In conclusion, we can summarize the key characteristics of Blockchain as follows:

- a. **Decentralization:** Information is recorded for distribution among peers, ensuring security.
- b. **Traceability of transfers:** Each element registered in the ledger is traceable, allowing for the identification of its origins at any time.
- c. **Disintermediation:** Blockchain platforms need no intermediaries.
- d. **Transparency and verifiability:** Data registered in the ledger are easily visible and accessible to each peer.
- e. **Immutability:** No registration can be modified without the shared consent of the majority of peers.
- f. **Programmability:** It is possible to program certain actions which take place only when predefined conditions are met (the foundation of smart contracts).

Figure 19: How the Blockchain works



Source: Deloitte, *Blockchain Enigma. Paradox. Opportunity*, 2019

3.2 Cryptocurrencies and tokens, the new monetary system

In recent decades, the global economy has been moving towards a future characterized as never before by the digital realm, thanks in large part to the ongoing development of technologies that underpin the virtualization of economic instruments. Today, the world of economic and financial transactions primarily operates on a virtual layer, initiating a process of "digitization" of currency. The pivotal event that marked this transition is undoubtedly the emergence of cryptocurrencies: digital currencies capable of being generated and distributed via the Internet. From an etymological analysis, it is easy to observe that the term consists of two words: "crypto" and "currency." When we refer to cryptocurrencies, we are therefore talking about a "hidden" currency, visible exclusively through knowledge of the so-called public and private access keys (Consob, 2019).

3.2.1 Cryptocurrencies

Digital money is a digital form of fiat currency⁵⁰, and cryptocurrencies are a subset of digital currencies. Therefore, every cryptocurrency is a digital currency, but not all digital currencies are cryptocurrencies. Specifically, when we refer to cryptocurrencies, we are talking about assets that are based on blockchain and DLT (Distributed Ledger Technology) technology. Cryptocurrencies, as a means of exchange, were the first application to harness the full potential offered by blockchain and DLT technology, ushering in a new paradigm in the realm of payments, often referred to as the Internet of Value. With the advent of cryptocurrencies, transactions directly connect the sender and recipient without allowing anyone access to the funds.

From an application perspective, the internet operates based on the TCP/IP protocol (Transmission Control Protocol / Internet Protocol), enabling the exchange of data worldwide, transferred as copies. In fact, whenever we upload a string of text, images, or information online, we are essentially uploading a digital copy, perceived as indistinguishable from the original, effectively generating a duplication of that content. However, when it comes to the transfer of value, the situation takes on a

⁵⁰ In economic terms, it is referred to non-convertible paper currency, generally accepted as a means of payment because it is declared as legal tender (also known as fiat currency) by the issuing state, regardless of its intrinsic value. (Treccani).

completely different perspective than the one just described because duplicating a transaction inevitably results in the loss of its uniqueness. Therefore, a scenario involving the transfer of money in the form of a copy is not conceivable, as it would immediately create the problem of double spending (Chiap, Ranalli, Bianchi, 2019). The issue in question, in traditional systems, is easily avoidable through a centralized authority responsible for acting as a guarantor between the parties and ensuring the correct execution of the transfer. Through blockchain and DLT (Distributed Ledger Technology), the problem can also be resolved in a decentralized system by leveraging the consensus aspect discussed earlier, thereby allowing the elimination of third parties in financial transactions and granting users the freedom to transfer value directly to one another. Each cryptocurrency develops its properties based on the blockchain on which it is built. Bitcoin, for example, will have different characteristics and properties from Ethereum or other altcoins⁵¹, because the blockchains on which these cryptocurrencies are developed also have different features. However, it is possible to identify common properties shared by most cryptocurrencies (Chiap, Ranalli, Bianchi, 2019):

- **Digital:** There is no physical equivalent of cryptocurrencies, so their form is purely virtual.
- **Global:** Cryptocurrencies have global validity, transcending physical or political borders, giving anyone the ability to conduct transactions;
- **Secure:** Security is one of the main strengths of cryptocurrencies, and ownership belongs to those who possess the private keys;
- **Immutable:** Once a transaction is added to the blockchain, no one can modify or remove it.
- **Open:** Due to the absence of a central authority and the fact that the network is open-source software, the code is freely accessible, allowing everyone to propose improvements and modify the code, facilitating updates to the blockchain software;
- **Neutral:** The cryptocurrency system is censorship resistant. Discrimination against the sender, recipient, or the subject of the transaction will never occur;

⁵¹ Altcoin, or 'Alternative Coin', is another term used to define cryptocurrencies other than Bitcoin.

- **Consensus-based:** In the cryptocurrency landscape, consensus is the tool that verifies whether a transaction is valid or not and defines the monetary policy to be implemented, taking into consideration various parameters, including Total Supply, Circulation Supply, and Max Supply, which respectively refer to the total quantity, quantity in circulation, and maximum quantity (Tubili, 2020).

3.2.2 Tokens and tokenization

The Digital Innovation Observatory of the Politecnico di Milano defines a token as a "*digital information, recorded on a distributed ledger, uniquely associated with one specific user of the system and representing some form of right: ownership of an asset, access to a service, receipt of a payment, and so on.*" The possibility of "**tokenizing**" assets, products, and services has also opened up the opportunity to use token sales as a form of financing for new project initiatives through Initial Coin Offerings (ICOs)⁵². Through ICOs, the investor supporting the issuing company receives tokens in return. These tokens can indeed be traded via the blockchain but are not equivalent to cryptocurrencies. Instead, the investor who has received the company's token acquires a specific right recognized by the issuer. For example, the token could be used to access the services of the same company or could represent, more akin to a share, an ownership stake in the company. The crucial difference between cryptocurrencies and tokens is that the latter do not have their own blockchain but rely on existing ones. What can confuse is that some tokens are actually used as a form of payment. This is why the Politecnico di Milano Observatory encourages making a distinction between fungible tokens and non-fungible tokens (NFTs). Stablecoins⁵³ and the digital currencies of central banks currently under study belong to the former. Fungible assets are those that can be replaced with something identical, and this

⁵² Initial Coin Offerings (ICO) are a form of financing used for blockchain projects and are nothing more than initial public offerings to the public in the cryptocurrency universe. The term ICO is derived from the traditional Initial Public Offering, which is the initial offering of financial instruments by an issuing entity that intends to be listed on the stock market for the first time. The difference is that in Initial Coin Offerings, the primary object of the offering is represented by a Coin or Token. These offerings materialize in the sale of a token, from which it is possible to obtain other cryptocurrencies or fiat money in exchange, with the aim of financing a project related to the blockchain. The entire process of token sale is entrusted to smart contracts, responsible for eliminating the need to go through the intermediation of a third party, thereby reducing transaction costs. (Capoti, De Lorenzo, Maggioni, 2018).

⁵³ Stablecoins serve as a bridge between the world of cryptocurrencies and the fiat currencies we use in our daily lives because their price is anchored to a reserve asset such as the US dollar or gold. Therefore, stablecoins are much less volatile than Bitcoin and represent a form of digital currency that is much more suitable for everyday commerce and cross-currency transfer operations (Coinbase).

category includes tokens that can be used as cryptocurrencies and, in general, those that have characteristics similar to those of digital money. The most intriguing tokens in terms of future scenarios are those belonging to the second category, non-fungible tokens. With these tokens, it is possible to represent any type of asset, both digital and physical.

We can distinguish two main categories of tokens: Security Tokens and Utility Tokens.

- **Security Tokens:** They represent ownership of a financial asset, essentially conferring a right of credit to which other subjective legal rights or situations can be accessed by law or contract. They are further subdivided into Equity Tokens and Asset Tokens. Equity Tokens grant the holder a right to earnings based on the capital held, derived, for example, from an application or platform. Asset Tokens, on the other hand, confer exclusive ownership of an asset. Just as credit instruments like bonds or other forms of borrowing grant the holder the right to the indicated performance. It is important to specify that tokens confer the right that the Distributed Ledger on which they are implemented has assigned, through Smart Contracts.
- **Utility Tokens:** They allow the purchase of a specific good or service, granting the holder an option to purchase or administer current or future things or service supplies, thus reserving benefits and premium services for those who hold them. This type of token also has subcategories: Voting Tokens, Work Tokens, and Consensus Tokens.
 - a. *Voting Tokens* grant governance voting rights to the holder;
 - b. *Work Tokens* reward those who perform certain actions or behaviours;
 - c. *Consensus Tokens* provide an incentive reward to nodes that ensure data validation and network consensus. The latter can be observed in Bitcoin, which rewards those who offer substantial computing power with new bitcoins.

We can, therefore, talk about a new phenomenon today, that of tokenization. One of the peculiarities of tokenization is that when an asset is associated with a token, its shares can be divided into smaller parts for sale. This is not always possible to do in a traditional manner. Fractionalization opens the doors to these investments even for those who want to get involved with limited amounts. This characteristic is also typical of cryptocurrencies; for example, one Bitcoin is worth about €24,000

today, but you don't need astronomical sums to buy it. You can get a fraction of it, even with just €10. Among the areas where tokenization can develop, we can mention:

- **Real estate**, which becomes more accessible when fragmented. Market participation expands.
- **Financial instruments**, in this case, tokenization is useful mainly because it provides shared ledgers between issuers and buyers.
- **Commodities**, offering greater liquidity and fewer barriers to entry compared to, for example, the purchase of gold bars.
- **Art, collectibles, and intellectual property.**

Taking the case of bonds, thanks to this new technology, physical or digital certificates for the issuance of securities are eliminated because the blockchain permanently stores everything, making it difficult to steal or alter information. The issuance details are encoded in a *smart contract*, ensuring authenticity, traceability of origin, and transparency. Payments are also processed immediately through a simple transaction without intermediaries like brokers. Furthermore, while bonds are typically settled during bank opening hours, with tokens, you can do it anytime. The blockchain operates 24/7. By eliminating latency periods, price fluctuations can be avoided, making everything faster.

Explaining what tokenization is and its significance, it is evident that the first advantage is the ability to trade and manage assets simply and efficiently. This is why Bank of America supports the idea that this practice is becoming a key factor in the adoption of digital assets. The strengths of tokenization are:

1. **Transparency**: all parties involved in buying and selling have access to up-to-date documentation.
2. **Traceability**: thanks to the blockchain, the origin of any payment or ownership transfer can be traced.
3. **Security**: certificates that cannot be modified or stolen.
4. **Efficiency**: the process is streamlined and requires minimal human intervention.
5. **Decentralization**: intermediaries are no longer necessary, reducing costs.

6. **Increased users:** they can buy assets without geographical limits and even in small fractions. Entry barriers are eliminated; one of the problems with traditional finance is that it is not always accessible to everyone in terms of both capital and procedures.
7. **Liquidity:** the ease of buying these tokens leads to an increase in capital volume in the reference market.

3.3 A new trend: Smart Contract, Metaverse and NFT

3.3.1 Smart Contract

Blockchain technology, in addition to recording simple data such as date, time, and transaction details, can also play a more active role. By incorporating more complex code within it, transactions can be executed automatically when certain conditions are met. This is done using **Smart Contracts**, which allow developers, entrepreneurs, and lawyers to write custom logic in the form of algorithms that leverage the characteristics of blockchain, namely immutability and distribution, thereby causing the automatic and irreversible execution of contract clauses translated into computer code (Boucher Philip, 2017). A Smart Contract is defined as **a program that operates on distributed ledger technology, whose execution automatically binds two or more parties based on predefined outcomes determined by the parties themselves** (Art.8-ter co. 2 D.L. 135/2018). Self-executing Smart Contracts, based on this functionality, are currently used in various projects and are continuously evolving. Simply put, the terms of an agreement between two or more parties are programmed in the form of computer code, a set of instructions that are stored in a blockchain. When specific conditions described accurately in the code are met, specific actions, also defined in the code beforehand, are automatically initiated. For example, a request for product delivery could trigger an instruction to make a payment. In turn, such an instruction could potentially trigger other guidelines present in other smart contracts. These "contracts" are "smart" because they optimize outcomes, streamlining the mechanism that governs relationships between parties. Furthermore, such a contract is "smart" not because it is "intelligent" in a rational sense, but because **it does not admit exceptions** or interpretations; it operates in a programmed and predetermined manner.

To make their operation possible, smart contracts rely on **oracles**⁵⁴, which are the primary source of information from outside the blockchain, providing inputs to them. Many upcoming applications primarily involve the financial sector, such as loans and insurance products that require substantial manual resources susceptible to automation. These types of contracts can fit into a myriad of applications, streamlining slow traditional bureaucratic procedures. By using smart contracts, one can generate and process contracts of any level of complexity without the need for a third party to intervene in the process. The intriguing nature of smart contracts arises from the fact that they can offer higher levels of transparency. For example, you can enter into a contract with an unidentified entity to exchange a valuable item for something else. The funds are held within the contract and will remain there until the counterparty fulfils its obligation to deliver the goods as part of the agreement. You can broadcast it to the network and validate it if all conditions are met, including verifying that the goods conform to what was stipulated in the contract. This ensures that both parties receive the agreed-upon items. Now, if the contract's counterparty fails to fulfil their part of the agreement, the funds would be automatically unlocked and refunded after a predetermined period. There's no need for the parties to communicate with each other to ensure the contract will be honoured.

The **Ethereum** blockchain was one of the first to implement its programming language and its own currency, specifically configured to support smart contracts. It's referred to as "a blockchain with a built-in Turing complete programming language that can be used to encode arbitrary transaction state transition functions, [...] by writing the logic in just a few lines of code" (Buterin Vitalik, Ethereum Whitepaper, 2014). (Buterin Vitalik, *Etherum Withepaper*, 2014) .

Smart contracts allow developers to create a wide variety of decentralized apps (DApps) and tokens. They are used in various fields, including new financial instruments, logistics, and games, and are stored on a blockchain like any other cryptocurrency transaction. Once a smart contract app is added to the blockchain, it generally cannot be deleted or modified. Decentralized applications, created through these codes, are abbreviated as **DApps** and form the foundation of Decentralized Finance (*DeFi*) and *Web3*.

⁵⁴ Oracles are third-party services that provide foreign information to Smart Contracts, acting as a bridge between the blockchain and the outside world (Binance).

- **DeFi:** The acronym DeFi, which stands for decentralized finance, is a general term used to refer to peer-to-peer financial services executed on public blockchains. With DeFi, most operations supported by traditional banks can be performed, such as earning interest, initiating loans, lending, purchasing insurance policies, trading derivatives, exchanging assets, and more. The key difference is that all of this happens more quickly and does not require documentation or the involvement of third parties. Like all cryptocurrency transactions, DeFi is global, peer-to-peer (transactions occur directly between two individuals without the intermediation of a centralized system), pseudonymous and open to everyone.
- **Web3:** The term Web3, coined in 2014 by Gavin Wood, co-founder of Ethereum and developer of Polkadot, is used to denote cutting-edge digital innovations and their applications on the internet that are based on blockchain technology. In Web3, the utmost importance is given to claiming ownership of digital assets, digital identity, and data decentralization.

DApps are applications built on a blockchain, and their functions correspond to various smart contracts, which are sets of code for various use cases beyond finance, including gaming and social networks, for example. Smart contracts can also support social functions: Decentralized Autonomous Organizations (DAOs) virtually bring together holders of a specific cryptocurrency (token holders) who have the right to express their views on DAO-related matters. The right to vote forms the basis of all governance functions, which are realized through smart contracts.

As of today, configuring smart contracts requires an initial expenditure of energy and expenses, making them more suitable for repetitive agreements rather than one-time contracts. Due to their very specific nature, they are not particularly suitable for situations subject to substantial changes during the contractual period. Their use effectively falls outside the control of established entities like nation-states and other jurisdictions. In this case, the code is considered part of the law, and all accidental errors or vulnerabilities become part of the contract. Exploiting bugs to take control of assets would not be considered theft since the error is part of the code. The goal is to place smart contracts within the broader legal framework and, as with paper contracts, impose additional requirements and invalidate clauses based on the parties' intent and the law as a whole. Smart contracts can lack

flexibility and the ability to adapt to changing circumstances or the parties' preferences. Therefore, to convert contracts into executable code, programmers may need to assume greater legal responsibility in terms of practical implementation. Changes to traditional contract law may be necessary to allow the evolution of these technologies, particularly regarding documentation retention rules and other considerations for the automated and deterministic nature of smart contracts, as well as their validity and applicability, which are becoming increasingly common today⁵⁵.

3.3.2 Conquering the Metaverse

The **Metaverse** is considered the **next Internet** by most, a technology ready to revolutionise our lives, not only online.

3.3.2.1 When the metaverse is born

The first meaning of the Metaverse, however, originates from the work of Neal Stephenson, who coined the term in “*Snow Crash*” (1992): A dystopian novel wherein the virtual realm provides a sanctuary from a world undergoing economic and social deterioration, devoid of national governance and under the control of organized crime. From this science fiction tradition, films on the subject have emerged, contributing to its operational definition: they do not explain what the Metaverse is or how it works, but they propose what could be done and become in the virtual world. In this regard, “Matrix” was one of the first examples of a cinematic Metaverse, followed by the recent “Ready Player One” by Spielberg. The narrative has no constraints other than imagination, but to truly build the Metaverse, one must confront technological limits. The early virtual worlds, therefore, were fantasy video games based on the exchange of simple text messages (Multi-User Dungeons), the height of technology in the 1970s. These “proto-metaverses” became increasingly complex, eventually creating three-dimensional environments populated by avatars, as seen in *The Sims* or the early 2000s’ *Second Life*.

These examples of the “modern Metaverse” embody the concept of a virtual society, characterized by aggregation, collaboration, and value exchange. The Linden Dollar, the currency of *Second Life*, has

⁵⁵ Partz Helen, *La banca centrale norvegese sceglie Ethereum per sviluppare la valuta digitale nazionale*, Cointelegraph., 2022, available at <https://it.cointelegraph.com/news/norwegian-central-bank-uses-ethereum-to-build-national-digital-currency>

indeed allowed various businesses (such as Adidas and the BBC) to enter the virtual world and raise capital by selling products and services. The torch then passed to gaming platforms like Minecraft, Roblox, and Fortnite, also based on blockchain technology, such as **The Sandbox** and **Decentraland**. These latter platforms have built the Metaverse empire. According to Statista.com, in 2022, the global Metaverse market was estimated at 65.5 billion US dollars. In 2023, it is expected to rise to 82 billion US dollars before reaching 936.6 billion US dollars by 2030. Instead, According to a recent McKinsey & Co. report, annual global spending in the metaverse by both businesses and consumers could potentially reach \$5 trillion by 2030. E-commerce activities within the metaverse are projected to account for approximately \$2 trillion to \$2.6 trillion, while virtual advertising efforts are estimated to contribute another \$144 billion to \$206 billion. Some visions of the metaverse not only involve immersive digital platforms where users can interact, shop, and engage in activities but also emphasize interoperability between these virtual worlds. This means that users can transfer their avatars from one platform to another. Today, while the metaverse may currently be perceived primarily as a gaming or entertainment experience, the concept has the potentiality to be spread to other aspects of our lives.

3.3.2.2 Definition and practical example of Metaverse

*“The Metaverse is a scalable and interoperable **network of 3D virtual worlds**, rendered in real-time, which can be experienced synchronously and persistently by an unlimited number of users with a sense of individual presence and **continuity of data**, such as identities, history, rights, objects, communications, and payments. (Matthew Ball, 2022)⁵⁶*

These elements form the building blocks for constructing the Metaverse, but its meaning will always be evolving. Present-day technology has not yet fully realized its potential, leading to skepticism when trying to explain what the Metaverse is and what it serves today. But how does the Metaverse work?

Analyzing the etymology of the word, we can define the Metaverse as the "universe of universes," meaning the collection of all virtual worlds, much like the way the internet brings web pages together into a single network. Specifically, the Metaverse should be unique and scalable, capable of accommodating a potentially infinite number of virtual worlds, which are computer-generated

⁵⁶ Matthew Ball, *The Metaverse: And How It Will Revolutionize Everything*, Liveright, 2022

simulated environments. Furthermore, these individual digital realities should be interoperable, meaning they share a common language, rules, and technical standards. However, as of today, there is some fragmentation observed: there isn't a single Metaverse but rather several closed and incompatible ecosystems. Various companies have created their own Metaverse, hoping to gain economic advantage. Nevertheless, the history of the internet domains teaches us that collaboration and open-source efforts have created value online. To understand what the Metaverse is and how it functions at a technical level, we need to consider three properties:

1. **Persistence:** The virtual world should not reset itself; our actions must be recorded, and the results preserved over time. Each user leaves a trace so that they can have a digital identity, formed by the memory of their achievements;
2. **Real-time rendering:** Environments must be generated live to respond to user inputs. The ability for free interaction would make the Metaverse truly immersive;
3. **Synchrony:** There exists only one valid version of the Metaverse, achieved by coordinating the devices of all participants. It is a contemporary and continuous experience.

These operations must then be "scaled" for an unlimited number of participants because the Metaverse is social and shared. However, even the best Graphic Processing Units (GPU) and Central Processing Units (CPU) currently available on the market are not capable of handling the immense amount of computations that arise from the definition of the Metaverse.

According to the Credit Suisse report⁵⁷, the Metaverse is an evolution toward a 3-D Internet achieved through the enhancement of five crucial components:

- **Devices/Hardware:** These serve as the primary interface between users (humans) and the Metaverse. These devices could include smartphones (which are expected to evolve and incorporate more functionalities in the coming years) as well as AR (Augmented Reality) and VR (Virtual Reality) devices.

⁵⁷ Credit Suisse, *Metaverse: A Guide to the Next-Gen Internet*, 2022.

- **Infrastructure:** the network and devices establish connections between the hardware and the content.
- **Content:** All types of software and content, including games offered within the Metaverse.
- **Community:** This relates to various use cases where multiple users interact and socialize within the platform.
- **Currency/Settlement:** This denotes the method employed for settling transactions related to participation, content creation, or direct commerce within the Metaverse.

Virtual Reality (VR) technology is continuously advancing to enhance the user experience, aiming for greater immersion and realism. Meta has been actively investing in Virtual Reality. In 2014, Meta acquired the Oculus company for \$2 billion. Furthermore, in October 2021, Meta announced the launch of a new visor known as "Project Cambria⁵⁸", which Zuckerberg considered superior to Oculus Quest 2 in terms of both user experience and technological capabilities. Meta's technology in Cambria will incorporate internal sensors for tracking eye and facial movements, enabling avatars to mimic our facial expressions effectively. This feature enhances communication of emotions and moods during interactions with others. Cambria will also include precise gesture detection technology, allowing users to manipulate virtual objects seamlessly. Additionally, it will include a sophisticated camera system capable of capturing real-world scenes in high resolution, facilitating integration with three-dimensional objects and the advanced avatars currently under development in Meta's research labs.

Among the 5 things you can do in the Metaverse, **gaming** stands out as the dominant application. However, you can also find **concerts**, **work meetings**, and even **fashion events** like Fashion Week. In the Metaverse, you can encounter digital twins of real cities, designed to optimize their functioning and create **smart cities**.

The most common criticism is that the two main crypto-based metaverses, The Sandbox and Decentraland, appear empty. While this may be a drawback, the low estimates of daily users could change over time. Additionally, many activities associated with The Sandbox and Decentraland occur outside of the Metaverse. For example, tokens like SAND and MANA enable users to participate in

⁵⁸ Everyeye Tech, *La grande confusione di Meta: I progetti per Metaverso, VR e social*, 2021.

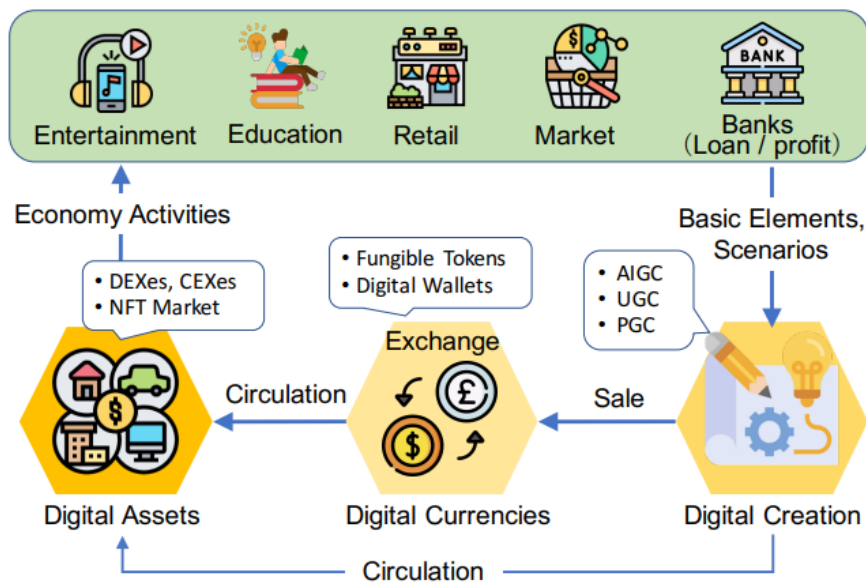
Metaverse governance by voting on significant decisions in dedicated forums. Similarly, in marketplaces like OpenSea, **players can trade items, avatars, and land because they are stored as NFTs in their wallets.** So, if these virtual worlds seem deserted, it's also because much happens elsewhere: the distribution of power and ownership are the real advantages of the crypto Metaverse.

Facebook's virtual world, on the other hand, will control its users' data, meaning they won't truly own their digital identity. However, decentralization can be both a pro and a con for the Metaverse. Despite the cited benefits of blockchain and cryptocurrencies, it currently seems impossible to do without a **powerful central server** capable of performing the complex calculations required by the Metaverse. The need for sophisticated and expensive hardware might hinder some users from accessing the Metaverse, presenting a downside unless cloud-based solutions are developed.

The definition of the Metaverse doesn't inherently feature blockchain as an essential technology; however, a significant portion of virtual worlds are also "crypto." In addition to the previously mentioned The Sandbox and Decentraland, there's Axie Infinity, a blockchain game that combines Metaverse elements with DeFi in a Play-to-Earn model, and Otherside for Bored Ape, the famous NFT monkeys. Within these new three-dimensional spaces, you can have a house, an office and it allows you to personalize your avatar with decorative items, furnishings, and finishes that can be purchased. Just like in real life, the Metaverse inevitably involves marketing strategies and a digital economy based on supply and demand. It also creates space for new specialists and designers affiliated with well-known brands or ready to take a leading position in this innovative context.

The concept of the "produser" is emerging, a neologism that refers to each user's dual role as a content creator and/or buyer within the context of an online free market utopia.

Figure 20: Framework of economic systems for the metaverse



Source: Huang, Huawei, et al., *Economic Systems in Metaverse: Basics, State of the Art, and Challenges*. arXiv preprint, 2022.

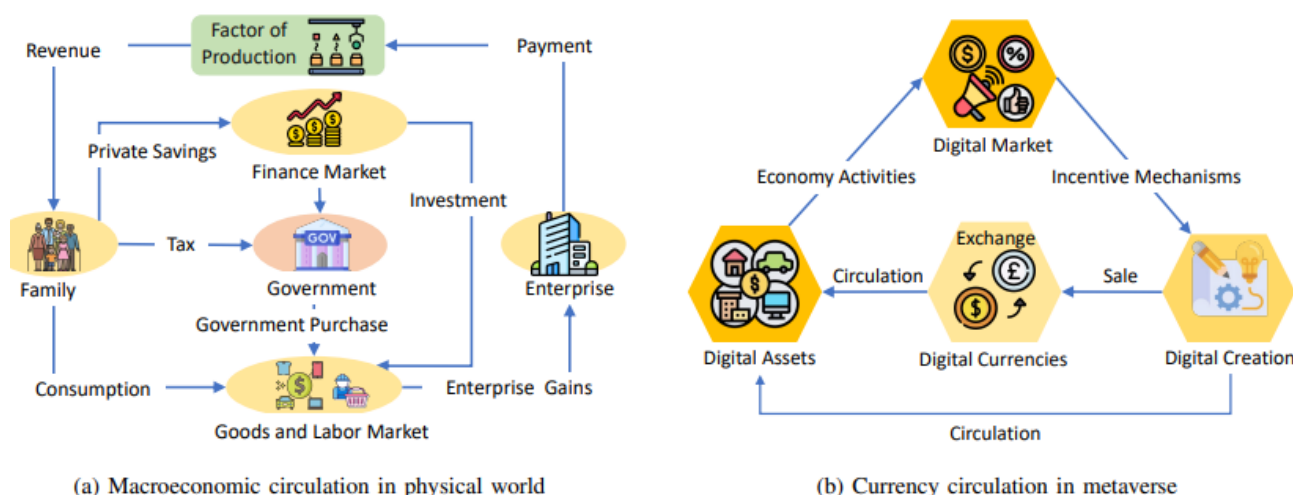
3.3.2.3 Economic System in Metaverse

Although the economic systems in the current physical world have been extensively developed, the fundamental question arises: "What should economic systems look like in both the current and future Metaverse?" In this virtual realm, economic systems must handle activities vastly different from those in the physical world, making real-world economic systems unsuitable for the Metaverse's digital landscape.

The digital market encompasses all product and service exchange activities reliant on internet-based digital technologies. It involves digitizing traditional products and services, like e-commerce and online marketplaces, which essentially transition offline transactions to the digital realm. At the micro level of the Metaverse's economic system, clients serve as the foundation for economic activities, acting as both producers and consumers of user-generated content. The exchange plays the role of an intermediary bridging the gap between production and consumption. In comparison with Figure 3a, the metaverse economy is powered by blockchain and cryptocurrency technologies. This new economic model differs from the traditional financial system, as seen in Figure 3b. Users can obtain

financial items from the decentralised metaverse market without the involvement of intermediaries such as banks, brokerages, or insurance firms. Decentralised finance (DeFi) is a novel way to innovate economic models in the metaverse that is based on smart contracts and crypto tokens. Empowered by advanced blockchain technologies, DeFi can boost the growth of decentralized markets and businesses in the Metaverse. Proven solutions like Uniswap, a decentralized exchange (DEX) built on Ethereum, automatically provide users with liquidity for their Metaverse tokens. Currently, major economic activities in the Metaverse are predominantly the auctions of virtual assets, including land, rare items, valuable real estate, land development and leasing, rewards for completing in-game tasks, and returns from cryptocurrency investments. These activities can be facilitated through cryptocurrency-based transactions. Moreover, cryptocurrencies find utility in various other Metaverse scenarios, such as advertising, e-commerce, event organization, social networks, and more.

Figure 21: Comparison of economic systems between the physical world and the metaverse



Source: Huang, Huawei, et al., *Economic Systems in Metaverse: Basics, State of the Art, and Challenges*. arXiv preprint, 2022.

3.3.3 NFT Era

Where do non-fungible tokens (NFTs) come from? In reality, the first NFT in history didn't even know it was one: it's Quantum, a video featuring a changing colour octagon button. Its creators, Jennifer and Kevin McCoy, were searching for a way to prove the "provenance" of digital artworks. In other words,

they wanted to certify their uniqueness, track ownership changes, and verify the artist's identity. In 2014, they recorded Quantum's information on the Namecoin blockchain, labelling the result as a "monetized graphic." This technology, by demonstrating the authenticity of non-copyable tokens, effectively gave value to online art. The verified data of Quantum, because it was stored immutably on a shared ledger, made its sale possible without intermediaries.

The acronym NFT, on the other hand, was coined only on September 20, 2017, when Dieter Shirley was working on the CryptoKitties project, a game based on breeding and caring for digital kittens in the form of NFTs. An **NFT** (Non-Fungible Token) is a **package of data recorded on a blockchain**, used to **prove ownership, authenticity, and uniqueness of physical objects and digital files**. Each NFT is associated with an **identification code** (ID) and **immutable metadata** written on the blockchain, the shared ledger that also certifies ownership transfers of the non-fungible token. This information is public and cannot be manipulated in any way.

In practice, the creation of an NFT, whether by an individual artist or a company, follows these steps:

- You choose the item to tokenize, such as images, music, or even a physical property. In the latter case, a **digital twin** is created, essentially a virtual representation of a real and tangible item.
- The information to identify the object is written on the blockchain, through the addition of a block, in the **minting process**⁵⁹.
- NFTs can then be created and sold through **marketplaces** like *OpenSea*, which allow anyone to carry out these operations independently.

If anything can be minted, the characteristics and purposes of the resulting tokens are equally varied. What unites them all, however, is their **non-fungibility**.

First of all, this quality makes each token **unique** in its kind, thus **not interchangeable** with others. Additionally, an NFT cannot be copied and is not easily spendable because it is **not divisible** into sub-

⁵⁹ In Web3, minting means coining new tokens and creating and distributing NFTs. Since tokens and NFTs are not tangible assets, minting involves the creation of new blocks within a blockchain. To generate a new block within a blockchain, it is necessary to register new information or validate transactions through a series of computational operations or Smart Contracts (Young Platform).

units. These are the main differences between NFTs and cryptocurrencies because cryptocurrencies are fungible in contrast: all Bitcoins are the same; therefore, each BTC can be replaced by any other, and they are divisible; the minimum unit is a *satoshi* (0.00000001 BTC), making them easily spendable. Their fungibility, in fact, makes cryptocurrencies a suitable means of exchange for payments, like fiat currencies.

From a technical standpoint, non-fungibility is achieved by assigning distinctive characteristics to each token, recorded in special software on the blockchain. These are the smart contracts that, precisely, enable minting, assigning an identification code (ID) to each non-fungible token and attaching essential information and characteristics to it, known as metadata.

In particular, each NFT is associated with a wallet address, which, along with its respective public and private keys, serves as proof of **ownership** of the work. In fact, a user in the blockchain network is identified by their *crypto wallet*. Smart contracts also govern the exchange of NFTs, transferring ownership when they are sent from one wallet to another. This ensures the traceability of the tokens and allows for the verification of their **authenticity**, tracing back to the creator's account. In summary, smart contracts define how NFTs function from a technical perspective. This means that non-fungible tokens are programmable: their operation can be predetermined, especially with regard to their intended purpose. In this regard, various **code models** have been proposed over time, based on the most common applications of this technology. Most of these are standardized on Ethereum and are therefore denoted by the acronym **ERC** (*Ethereum Request for Comment*) followed by a unique number identifier.

3.3.3.1 Main NFT's Standards

- **ERC-721**: This standard was created for crypto **tokens** that should **not be fungible**, meaning they should not be equivalent or perfectly divisible but rather unique and with richer metadata. ERC-20 tokens of the same type are interchangeable because they are fungible, whereas each NFT has a different value, so there are no equivalent ERC-721 tokens. The most famous collections, such as *Cryptopunks* and *Bored Ape Yacht Club*, are ERC-721 tokens, and due to their ability to hold value over time, supported by a solid project, they are also called *blue chips*.

- **ERC-1155**: When an object is tokenized into **multiple identical copies**, it is defined as **semi-fungible**. The reference standard for this is ERC-1155, which assigns the same ID to all replicas. This is the case for some in-game items in the Metaverse, music tracks, or limited-edition collectibles. A particular example of *semi-fungible tokens* (SFT) could be tickets for access to a concert without assigned seats: they have a finite number but all serve the same purpose, so they are interchangeable (fungible). However, after serving their function, they lose their face value, becoming a simple collectible, now non-fungible. In other words, they "transform" from fungible tokens into NFTs.

3.3.3.2 Types and various uses of NFTs

First of all, the **art world** is fertile ground for non-fungible tokens (NFTs), such that Beeple, a digital artist, managed to sell the artwork "*Everyday, the First 5000 Days*" for \$69.4 million. In the realm of NFTs, two artistic trends have emerged, dividing artists. On one hand, there are artists who create 1/1 artworks, which are unique and non-replicable pieces sold in a single copy. On the other hand, there are those who create entire collections containing numerous works, which in some cases may be sold in multiple copies. There is also the realm of **generative art**, where NFTs are generated by algorithms that combine various artistic styles and subjects based on precise directives, partly from the artist and partly from **artificial intelligence**.

Non-fungible tokens also find a natural application in the world of **videogames** because they can represent any in-game asset. Players can monetize their enjoyment by becoming direct owners of their progress and the items they have acquired. **Gaming NFTs** (gNFTs) require specific functionality and greater complexity, achieved through two new standards, 998 and 3664. Consider, for instance, a character in an online role-playing game, composed of weapons, shields, accessories, and virtual currencies in the form of tokens. **ERC-998** allows all these tokens, both fungible and non-fungible, to be merged into a single NFT. **ERC-3664**, on the other hand, allows NFTs to change over time; the characteristics of in-game objects can be modified, improved, and transferred to other items.

The case of gaming is representative of a certain dynamism of non-fungible tokens: this variability, however, may also depend on information coming from the offline world. In other words, **dynamic**

NFTs change their characteristics based on weather forecasts, the outcomes of a sporting event or the results of a poll; all data suggested to the smart contract by oracles.

Among the types of **NFTs**, we find **fractional** ones. In short, a non-fungible token is transferred to a smart contract, which in return generates a certain number of fungible tokens. Each of these represents a part of the ownership of the NFT and a fraction of its value; the asset is thus shared among multiple users who couldn't afford to purchase the entire work. Fractional tokens are an extreme case among non-fungible tokens because they eliminate exclusivity and uniqueness.

POAP, an acronym for the *Proof of Attendance Protocol* on which they are based, are essentially NFTs that certify your **participation** in a certain **event**. These tokens, built on the ERC-721 standard, also record personal achievements on the blockchain, including educational degrees and work experiences. They are similar to **badges**, pins to be added to your crypto wallet, in order to demonstrate your accomplishments.

If credits are individual, however, they must be irrevocably linked to your wallet address to prevent the sale of false certifications. This is where **soulbound NFTs** come into play. In practice, these are tokens that cannot change ownership; once minted, they remain locked in the destination wallet. There is a specific standard for soulbound NFTs, known as **ERC-5114**.

NFTs are often used as profile pictures or avatars. There are collections with limited elements designed for this purpose, known as **PFP** (profile picture) collections. With the help of computerized support that operates based on precise code instructions provided by the artist, a series of NFTs that are similar to each other but entirely different are created. The main characteristic is to portray a character or animal in an entirely new way and with an artistic quality that sets it apart from everything else. This trend has proven to be particularly influential in recent years (recall the Bored Ape phenomenon that involved many international celebrities). Especially when followed by public and famous figures, this usage of NFTs suddenly receives significant free publicity, and as a result, the artist behind it gains popularity.

Figure 22: Example of PFP NFT



Source: Andrea Biancolli, I vari tipi di NFT che devi conoscere, Blockchainitalia, 2022

A significant portion of the overall NFT revenue today is represented by collectible NFTs. The secret of these NFTs lies in their rarity, which inevitably influences their price and artistic value. Collectibles are a sector easily accessible through NFTs, especially if these NFTs originate from existing projects or well-known brands, such as the NBA. Today, there are many NFTs based on NBA team series, naturally attracting investors who aim not only to acquire the rarest NFT but to complete the entire collection to which that NFT belongs.

To mention other types of NFTs, we can talk about **photographic NFTs**, born from the desire of professional photographers to bring their work into the world of NFTs. The idea of these artists is to combine the world of photography with other artistic disciplines to create ever-new NFTs.

Furthermore, this technology can be highly functional for musicians and creators, whose income has progressively reduced in favour of a few prestigious labels and record companies that are impossible to compete with. This is why the advent of **musical NFTs** has represented a real turning point for this sector. Through NFT technology, artists regain control of their art, which now, with NFTs, allows them to receive fair compensation. The ability to trace ownership, in addition to proving originality, makes blockchain an effective tool for protecting **copyright**. Thus, digital art can receive the recognition it deserves, and artists will regain their rightful profits through **royalties**. Musical NFTs, in fact, can be described as a tokenized version of the artist's track or composition.

We conclude the examination of various types with those that will be analyzed in the case study of this dissertation, **NFT wearables**. They refer to virtual clothing that can be worn by the user's avatar in the metaverse, including items such as bags, shirts, hats, shoes, etc. What sets NFT wearables apart is all the uses that emerge for the user's greatest benefit. Instead of just offering digital garments for the avatar, NFT wearables also allow the user to wear those virtual clothes thanks to technologies like AR. This latter can possibly provide two versions of just one single item: one In Real Life and the other one for the metaverse. It is commonly known that brands are looking to expand into new areas of digital engagement with their customers. Creating a vibrant platform that offers digital experiences and ownership for users will help brands expand their image and products.

3.3.3.3 What is the real NFT value?

Non-fungible tokens have demonstrated that images on the internet can hold value. With their characteristics of authenticity, traceability, and uniqueness, it is easy to recognize the **originals**, allowing one to trace back to the creators of non-fungible tokens, thus providing an advantage that holds economic significance. The ability to distinguish fakes and counterfeits, in fact, protects the value attributed to an NFT by its **creator**. The mere name of the artist, especially if talented and renowned, sometimes sets a high price.

Even in the crypto art market, **the law of supply and demand** is applied. A non-fungible token has limited availability by nature: it can be a single copy or have a specific number of copies defined at creation. Therefore, if the circulating quantity is fixed, the supply of an NFT cannot change over time. Consequently, as demand increases, the price should statistically rise. **Scarcity**, therefore, is a value in the price calculation: the rarer a token, the more valuable it will be, at least according to the law of supply and demand. However, when a non-fungible token is unique but part of a larger collection, it is its "traits" and attributes that determine its rarity. In addition, NFTs provide value due to their permanence. They cannot be destroyed unless the creator decides to do so, which gives them permanence.

Lastly, one must consider **market liquidity**: if no one is willing to buy a non-fungible token at the "recommended" price, despite its scarcity and rarity, its value would inevitably decrease until it meets

the potential demand. This is the case with the first tweet in history, tokenized and purchased for nearly 3 million dollars, but now struggling to receive "adequate" offers on Opensea.

Of course, the **utility** of an NFT must also be taken into account. We discussed earlier the various uses it can have and how owning an NFT allows its holder to be part of an exclusive **community** that enjoys benefits such as project governance powers, exclusive airdrops, brand product discounts, as well as access to real-life events. In a sense, we could say that the true value of an NFT that is part of a collection lies in its community, gathered around the project: it's the users who invest it with meaning and make the tokens valuable. To determine the value of a non-fungible collection, we must consider its ability to generate **interest**, build customer loyalty with those inside and attract those curious observers from the outside. On the other hand, someone purchasing a token might be seeking a sense of community: it allows them to join a group of like-minded people with shared interests and values. Aggregation is a human tendency, but at the same time, we seek to assert our **individuality**: we might identify perfectly with the image of a non-fungible token, choosing it to represent our online identity.

In other words, the value of an NFT is both **subjective** and **socially recognized**: the community and individuals justify the cost, and as a result, the market will appreciate the tokens. In fact, the virtuous circle generated by the shared ideals of the community and tokens as an "extension of personality" drives the demand for certain collections.

Chapter 4: Nike's acquisition of RTFKT

Before going into the specifics of the case study in this dissertation, it is necessary to examine the valuation methods that will be used to analyse, from a financial perspective, Nike's acquisition of RTFKT, a web3 start-up operating in the digital fashion sector by creating NFT wearables for the metaverse. Additionally, it is crucial to make acquisition considerations from a strategic standpoint in relation to the objectives of the giant street and sportswear brand.

4.1 Valuation Methodologies

4.1.1 Discounted Cash Flow Theory

During various financial processes such as IPOs, corporate debt restructuring, investment decisions, and assessments for mergers and acquisitions (M&A), one of the most commonly used valuation techniques is the **Discounted Cash Flows (DCF)** model.

In the valuation process, it is essential to differentiate between valuing the target company's stock (**Equity side**) and valuing the entire organization, which includes its debt (**Asset Side**). This differentiation significantly impacts the model, particularly affecting the discount rates and cash flows (CF).

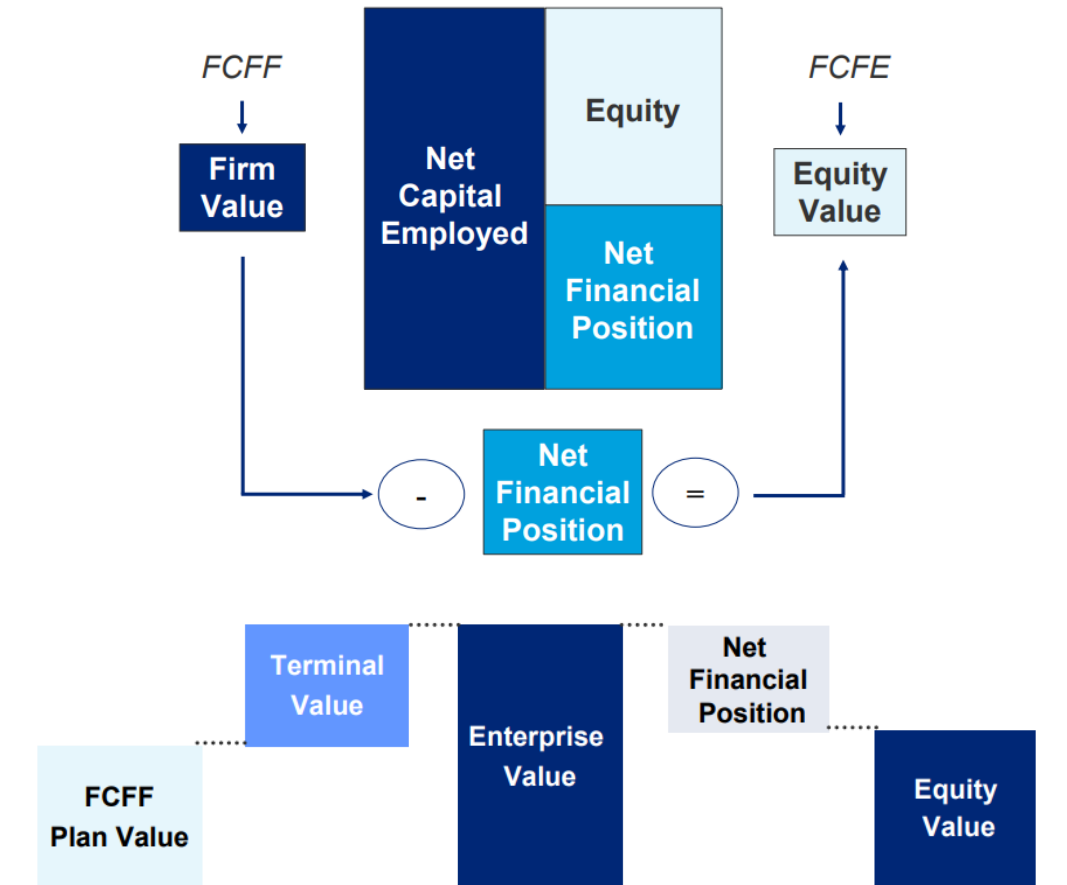
The DCF model considered an asset-side model, operates under the assumption that the present value (PV) of a company equals the sum of its future cash flows, suitably discounted with a **discount rate** that incorporates the **time value of money** and the **uncertainty** of the future CF, for an effectively infinite period. Since it is inherently challenging to predict a company's exact duration, the notion of a company having a hypothetically infinite lifespan is generally accepted. For practical purposes, this infinite period is divided into two segments: the *explicit forecast period* and the *Terminal Value*, which represents the free cash flows (FCFs) generated beyond the defined forecasting horizon.

The DCF approach's principal goal is to assess the firm's worth for all stakeholders, including both equity and debt holders. It enables them to determine the current value of their investment based on the company's future expectations.

$$\text{Enterprise Value (EV)} = \text{Market Value of Equity} + \text{Net Financial Position}$$

$$\text{Net Financial Position} = \text{Debt} - \text{Cash and Cash Equivalent}$$

Figure 23: Relation between EV, Equity Value, NFP



Source: M. Vulpiani, *Special Cases of Business Valuation*, McGraw Hill, 2014

Enterprise value represents the unencumbered worth of the core business, excluding both debt and cash. It can be thought of as the net expense of acquiring the target company's equity, assuming control of its cash, settling any outstanding debts, and thereby acquiring ownership of the unlevered business⁶⁰.

To accomplish the evaluation goal, The analysis can be organized into a sequence of crucial steps and the model can be executed by employing the following equation:

⁶⁰ Berk J. & De Marzo. *Corporate Finance*, Pearson, 2020

$$EV = \sum_{t=0}^T \frac{FCF_t}{(1 + WACC)^t} + \frac{TV}{(1 + WACC)^T}$$

Where:

EV = Enterprise value

FCF = Free Cash Flow for period t

WACC = weighted average cost of capital, the discount rate that we must use

TV = Terminal Rate

According to "A Tutorial on the Discounted Cash Flow Model for Valuing Companies⁶¹" by Lars Peter Jennergren, the model's primary elements are:

1. Using historical data, free cash flow is estimated by taking into account the assets and liabilities associated to the firm's operating activities. Cash flows are determined net of financial charges (**Unlevered Cash Flow**), that is, without the influence of debt leverage. The following formula is used to determine the funds available to fulfil obligations to both debt and equity holders.

$$EBIT = EBITDA - Depreciation$$

$$NOPAT = EBIT * (1 - t)$$

$$FCF = NOPAT + Depreciation - CAPEX - \Delta NWC$$

Where:

EBITDA = earnings before interests, taxes depreciation and amortization

EBIT = earnings before interest and taxes

(1 - t) = Tax Payment

NOPAT = net operating profit after taxes

CAPEX = Capital Expenditure

Δ NWC = Increase (Decrease) net working capital

2. The next step is to forecast future free cash flow. To do so, you must first choose a projection horizon, which commonly covers from 5 to 10 years, and then calculate the **terminal value**.

⁶¹ Jennergren L. P., *A Tutorial on the Discounted Cash Flow Model for Valuation of Companies*, SSE/EFI Working paper series in business administration, 2011.

This value is calculated using the *growing perpetuity formula*, which assumes that the value of the normalised cash flow will grow at a steady rate each year of the remaining life.

$$TV = \frac{FCF_n * (1 + g)}{(WACC - g)}$$

Where:

g = growth rate of FCFs

n = last period considered

3. The final stage is discounting the free cash flows using an appropriate discount factor. The expected cash flows must be discounted at the opportunity cost rate, corresponding to the rate of return that could be achieved on a comparable-risk investment. This approach might be applied to an entire company. This strategy might be used across the whole company. For both debt and equity investors, the **WACC** is required to discount the free cash flow (Garca, F. J. P., 2017). Its formula is as follows:

$$WACC = Ke * \frac{E}{(D + E)} + Kd \frac{D}{(D + E)} * (1 - t)$$

Where:

E = Market value of equity

D = Market value of debt

Ke = Cost of Equity

Kd = Cost of debt

t = corporate tax rate

The **Ke** is calculated through the application of *CAPM formula*:

$$K_e = R_f + Beta_l * MRP$$

Where:

R_f = Risk - free rate

Beta_l = Beta levered

MRP = Market risk premium

The equation for WACC considers that both debt and equity should be valued at their market values. Additionally, it considers the tax shield effect of debt, which results from the ability to deduct interest payments when calculating taxes. Proper identification of both the cost of debt and the cost of equity is crucial for arriving at a reliable result.

In summary, by combining the discounted terminal value with the cumulated discounted cash flows, we get the company's enterprise value.

The Enterprise value can be seen as the net cost of acquiring the firm's equity, collecting its cash & equivalents, settling all debt, and holding the business without debt financing.

By utilizing data related to the company's performance, cost of capital, and expected future growth rate, the discounted cash flows model allows for a highly accurate evaluation, although not entirely exhaustive.

4.1.2 Dividend Discount Model Theory

The **Dividend Discount Model** is an equity side valuation method focusing exclusively on dividends as cash flows to equity. The rationale of this model is that the price paid for a stock by an investor is equivalent to the **predicted future cash flows**, which **are the dividends** paid during the holding term and the final sale price at the end of the investment horizon. This principle is rooted in the present value rule, which regards the value of any asset as the outcome of its future associated cash flows, discounted at a rate commensurate with the risk assumed (Berk & DeMarzo, 2019). Consequently, based on what has just been explained, when examining a two-year investment scenario, it is possible to establish the stock price at time 0 as equal to the present value of the expected cash flows:

$$P_0 = \frac{DIV_1}{1 + Ke} + \frac{DIV_2 + P_2}{(1 + Ke)^2}$$

Even when considering an investment horizon of one year or extending it by several years, the valuation methodology remains unchanged. This approach is applicable regardless of the investment horizon, enabling the Dividend Discount Model equation to be defined for any N years. Since even the

expected prices are derived from future dividends, the value of the stock is determined as the present value of perpetual dividends:

$$P_0 = \sum_{n=1}^{\Delta} \frac{DIV_n}{(1 + Ke)^n}$$

In a simplified growth model scenario, for a company to witness an increase in the value of its shares, it would need to raise both its dividends and its growth rate (g). However, achieving both simultaneously presents a challenge because there exists a trade-off: an increase in the growth rate can be the result of investments, and these investments would restrict the funds available for dividend payouts. To address this, we introduce the concept of the **dividend payout ratio**, i.e., the percentage of earnings distributed to shareholders in the form of dividends each year. The company has the discretion to decide whether to retain earnings for internal investment (*retention rate*) or distribute dividends to shareholders. (Berk & DeMarzo, 2019).

The assumption of steady growth can be maintained, making Gordon's model suitable for stable growth companies. It is particularly effective for businesses that are expanding at a rate equal to or below that of the overall economy and have established dividend distribution policies they intend to maintain in the future.

However, despite its simplicity and logical reasoning, the Dividend Discount Model has limitations. Future dividends are subject to a significant degree of uncertainty, and even small discrepancies in growth rate estimates can result in substantial changes in stock value. Additionally, some companies pay out dividends that exceed their actual cash flows, often covering the gap through additional debt or equity issuance. Valuing such firms using the DDM can lead to an overly optimistic assessment of their value (Damodaran, 2011).

4.1.3 Multiple Method Theory

Valuation methods can be categorized from both an analytical and a relative perspective:

- *Intrinsic valuation*: These methods focus on the fundamental aspects of a business, such as the cash flow generated by the company. Models like the Discounted Cash Flow (DCF) method

rely on the company's business plan to assess its cash position. The timing is critical in these methods, as the accounting values used for analysis must be taken from a specific date;

- *Relative valuation*: this approach determines a firm's value based on values observed in comparable firms. Instead of directly calculating the firm's value, it is estimated by examining market-derived values.

The **Multiple Method** is the most commonly used relative valuation approach, which involves comparing the target firm to similar assets or companies, analysing their key balance sheet, income, and key performance elements.

By identifying comparable companies, this method assumes that their future free cash flows, risk profile, payout ratio and growth rate will be similar. This approach is based on the assumption that there exists a sufficient number of firms that are comparable to the subject of value (target).

The market multiples technique is based on the idea that market prices provide the best indicator of a firm's value and aims to establish the relationship between price and the company's economic parameters. As a result, the target's value, as determined by multiples, may be overestimated, or underestimated when the market overestimates or underestimates comparable firms.

The Multiple Method has both advantages and disadvantages, which can sometimes overlap.

Analysts opt for relative valuation due to its simplicity and efficiency, as it demands less time and data compared to the DCF model. However, this streamlined approach may result in less comprehensive estimations and fail to encompass crucial and distinctive factors of the organization, such as risk and growth potential. The popularity of using multiples is also associated with its ability to mirror current market trends. Nonetheless, this reliance on market trends can sometimes be counterproductive, as it may highlight instances of potential market overvaluation or undervaluation. Furthermore, from an analyst's standpoint, valuations based on multiples may be easier to justify and present to potential investors, given their reliance on more evident and market-consistent rationales, in contrast to absolute techniques, which rely on several underlying assumptions.

After discussing the widespread adoption of this method and its limitations, we can now proceed to explain how market multiples are utilized in valuation and outline the primary steps involved. These steps encompass five key phases:

1. *Select the universe of comparable companies:* begin by conducting research to identify a suitable set of comparable firms for the subject company. Typically, there's a tendency to narrow down this set to companies operating within the same industry and of similar size. However, it's essential to acknowledge the uniqueness and distinct characteristics of each organization. The two most commonly utilized metrics for comparison are *business-related factors* (such as sector, products, services, customer base, end markets, distribution channels, and geography) and **financial profile factors** (including size, profitability, growth, return on investment, and creditworthiness);
2. *Gather the Necessary Financial Data for Calculating Multiples:* A multiple is essentially a market valuation measure with the numerator representing factors like enterprise value or equity value, divided by an accounting metric of financial performance in the denominator, such as EBITDA or net income. For Enterprise Value Multiples, the denominator involves a financial metric that applies to both debt and equity holders, such as sales, EBITDA, or EBIT. Conversely, Equity Value (or Share Price) multiples use equity in the numerator, and the denominator must be a financial metric that pertains solely to equity holders, such as net income or diluted earnings per share (EPS);
3. *Standardize market prices* by converting financial measures into **ratios** such as earnings, revenues, and book values. This standardization allows for the scaling of prices when comparing companies of varying sizes, thereby making them directly comparable;
4. *Benchmark the comparable companies:* Analyse and compare each of the comparable companies with one another and the target to determine the target's relative ranking. First, benchmark financial statistics and ratios to identify the best comparable and note potential outliers; then benchmark the trading multiples;
5. *Determine the valuation:* From trading multiples you derive the appropriate valuation rate for the target, using means and medians of the most relevant multiple for the sector. Define the

high and the low. The multiples of the best comparable are relied upon for selecting the tightest most appropriate range. The selected multiple range is applied to the target's appropriate financial stat to derive an implied valuation range.

There are two primary categories of multiples: **equity value multiples** (equity side) and **enterprise value multiples** (asset side). The former establishes a connection between the market value of a company's stock and one of the most common indicators like earnings, revenues, cash flows, and book value. In contrast, the latter employs enterprise value as the numerator, providing an overview of a company's comprehensive worth and facilitating the analysis of companies with varying degrees of leverage.

Therefore, the most widely recognized equity and asset-side multiples include:

- *Price-to-Earnings (P/E) ratio*. this ratio relates the market value of a company's equity to its earnings. In this ratio, the numerator represents the share price, and the denominator corresponds to earnings per share (EPS), ensuring consistency. The multiples valuation model considers the same attributes as financial methods, such as the company's capacity to generate cash flow, its growth rate, and its level of risk. To gain a proper understanding of it, we have to start by considering Gordon's model of perpetual growth. By dividing both sides of the equation by EPS, we get:

$$\text{Forward} \frac{P}{E} = \frac{P_0}{EPS_1} = \frac{Div_1}{EPS_1} * \frac{1}{(Ke - g)}$$

- *Price-to-Book (P/B) ratio*: the P/B ratio is a measure of the relationship between a company's market value and its book value. In this context, the numerator reflects the market's expectations for future growth and performance, while the denominator signifies the disparity between the book value of assets and liabilities. It evaluates a company's capability to generate future returns on the capital invested. Computing this multiple directs attention to how the

⁶² Forward P/E (Forward Price to Earnings) is a measure of the price-to-earnings ratio that indicates the company's earnings in the coming year. Through this indicator, it is possible to tell whether the company is headed for earnings growth or decline. The Forward P/E is about the company's own forecasts.

market perceives the company in comparison to the historical equity value recorded in its balance sheet;

- *Enterprise Value to EBITDA (EV/EBITDA)*: this multiple is based on the premise that a company might experience a significant reduction in overall profitability due to country-specific tax regulations or improper application of depreciation policies. These factors distinguish a firm's EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) from its corresponding net profit. By dividing the enterprise value by EBITDA, analysts obtain a measure of how the market values the company concerning its performance before considering the effects of depreciation, amortization, and taxes;
- *Enterprise Value to EBIT (EV/EBIT)*: This multiple indicates company's capacity to generate value through its core operations before taxes. The weaknesses of this market multiple include the temporal misalignment between the numerator and denominator (a ratio between market data and accounting values) and the necessity to account for the company management's accounting policies;
- *Enterprise value to Revenue ratio (EV/Revenue)* or *Price-to-Sales ratio (P/S)*: these are revenue-based multiples utilized to evaluate start-ups that may not be profitable yet or possess substantial growth potential.

4.2 The reasons behind RTFKT acquisition

Based in Oregon, Nike (NKE) is one of the most famous brands in the world. Founded in 1964 under the name Blue Ribbon Sports, the company is still one of the strongest in its field. Renowned for its iconic “Just Do It” slogan, Nike is the world's largest supplier of sportswear and footwear and has announced a four-year strategy that highlights its main areas of focus: a business model based on investments in DTC (Direct to Consumer), strategic selection of wholesale partners and significant investments in digital technologies. As part of its strategy, it plans to allocate \$1.2 billion to digital transformation by 2025. In fact, several acquisitions have been made in recent years targeting the data collection and analysis sector, such as Celect (a predictive analytics and demand sensing company) and Datalogue (a leading data integration platform start-up) acquired in 2019 and 2021 respectively.

And it is precisely on November 13th, 2021, that the world's leading sports brand announced the acquisition of RTFKT, a creator-led organization producing digital artifacts, specifically sneakers, backed by NFTs. The agreement would allow Nike to capitalise on the metaverse's prospects by exploiting RTFKT's expertise and community. According to Nike CEO John Donahoe, this transaction serves **Nike's digital transformation goal**, and it is the sixth acquisition focused on the digital side of retail since 2018. Nike has officially bought RTFKT on December 13th, 2021. (the terms of the agreement were not disclosed).

“This acquisition is another step that accelerates Nike’s digital transformation and allows us to serve athletes and creators at the intersection of sport, creativity, gaming and culture. We’re acquiring a very talented team of creators with an authentic and connected brand. Our plan is to invest in the RTFKT brand, serve and grow their innovative and creative community and extend Nike’s digital footprint and capabilities.” (John Donahoe, President and CEO of Nike).

Founded in 2020 during the onset of the Covid pandemic by Benoit Pagotto, Chris Le, and Steven Vasilev, **RTFKT** is an avant-garde **digital fashion start-up** specializing in **NFT collectibles**. RTFKT is at the forefront of innovation, pushing the boundaries between physical and digital value to create the next generation of collectibles that blend culture and gaming.

RTFKT leverages cutting-edge technologies, including in-game engines, NFTs, blockchain authentication, and augmented reality, combined with their manufacturing know-how. This unique mix enables them to create exclusive **limited edition custom sneakers**, accompanied by distinct virtual counterparts that users can try on and enjoy special effects. Beyond their own NFT releases, RTFKT has collaborated with other crypto creators to design physical shoes incorporating imagery from various NFT projects, including CryptoPunks and Bored Apes.

The start-up secured an impressive **\$8.2 million in seed round**, obtaining a **valuation of the company equal to \$33.3 million** in 2022. Their expansion plans include scaling up their team from three members, with a focus on recruiting creators and artists, establishing an NFT marketplace, and investing in individuals contributing to the development of the metaverse and virtual environments.

In the broader context, the global sports equipment and apparel market size was valued at USD 341 billion in 2022 and is anticipated to surge to USD 611.27 billion by 2031, exhibiting a robust CAGR of 6.7% during the period from 2023 to 2031. Very appealing is Morgan Stanley's prediction of the future of clothing brands, which states that the demand for digital fashion and luxury is growing fast. As many young people spend much more time with friends on social rather than in real life, they are shifting their social needs to the metaverse, thus increasing demand for wearable NFTs. Although they have high potential, NFTs for luxury brands represent a minimal share of the market (1% by 2021). However, analysts predict that metaverse gaming and NFTs may constitute 10% of the Luxury Goods addressable market by 2030, with revenue growth of up to €50bn⁶³.

Figure: 24: 2030 Luxury Goods TAM (Total addressable market) and blue-sky scenario to revenue and EBIT from NFT and Metaverse gaming collaborations

	2019	2020	2021e	2025e	2030e	Blue Sky	
						NFT % TAM	Gaming % TAM
Personal luxury goods (total)	281	217	290	380	520		
Five-year CAGR				+12%	+6%		
Luxury cosmetics	60	48	60	79	104		
Penetration of cosmetics	21%	22%	21%	21%	20%		
Personal luxury goods (ex. Cosmetics)	221	169	230	301	415	5.5%	6.2%
Average EBIT margin of names covered	26%	24%	30%	31%	31%		
Avg. industry EBIT margin	21%	19%	22%	22%	23%		
Luxury EBIT pool	45	33	50	67	95	19.8%	6.7%

Source: Morgan Stanley, *Luxury in the metaverse*, Europe Insight, 2021

The Covid-19 pandemic has significantly boosted the digitization process across various industries. Particularly in the consumer-oriented retail sector, nearly **every brand is embracing metaverse-related technologies through M&A activities or strategic partnerships**. Renowned sports and footwear giant like Nike is no exception, and its acquisition of RTFTK aligns with its ongoing digitalization endeavours. The talented team from RTFTK will play a pivotal role in Nike's strategy of integrating premium physical products with their virtual counterparts. The acquired company will fall

⁶³ Source: Morgan Stanley, *Luxury in the metaverse*, Europe Insight, 2021, available at <https://theblockchaintest.com/uploads/resources/Morgan%20Stanley%20-%20Luxury%20in%20the%20Metaverse%20-%202021%20Nov%20.pdf>

under the umbrella of the newly established "Metaverse Studio," a department dedicated to driving Nike's growth in the virtual realm.

Among the motivations behind this acquisition is the mounting competition from other households like Adidas, which recently partnered with the creator of the NFT collection Bored Ape, Yuga Labs. Thus, Nike's move can be seen as a strategic imperative move to remain competitive. Furthermore, RTFTK will aid Nike in various virtual initiatives the company has embarked upon, including video gaming, the Roblox world **NIKELAND**, and the development of their inaugural NFT customizable sneaker collection, **CryptoKicks**. The main idea is to fuse the purchase of a physical Nike shoe with a non-fungible token, serving as both proof of authenticity and a tradable asset.

Figure 25: Nikeland on Roblox and CryptoKicks NFT



Source: Eduardo Rosicart, *Marketing nel Metaverse*, Metaverse news, 2023 available at <https://metaverse-news.es/>

According to the crypto analysis platform *Dune*, Nike's non-fungible token projects have substantially increased the **company's revenue** to a remarkable **USD 186.34 million in 2023**⁶⁴. This figure is more than seven times the NFT revenue generated by the luxury fashion brand Dolce & Gabbana, which holds the second position in NFT profits. In contrast, Nike's direct competitor, Adidas, secured the fifth spot with a total revenue of USD 11 million, although it ranked second in terms of transaction volume, with more than 57,360 transactions.

From the point of view of the target company, RTFTK can benefit significantly from the alignment with Nike and tapping into the extensive resources available for growth within the Nike ecosystem.

⁶⁴ Data available at <https://dune.com/kingjames23/nft-project-possible-data-to-use>

Importantly, RTFTK will retain its name and its core team, safeguarding its distinct brand identity, which has been steadily gaining popularity within the NFT landscape. Additionally, the deep expertise of Nike's staff members is poised to substantially contribute to the innovation and expansion of this emerging start-up.

4.3 Financial Valuation of Nike

The acquisition of Nike represents a structural investment for the company, as the company in question will try to adapt to the market and the looming digital innovations, such as blockchain and NFTs, which are expanding in the market. Within this framework, in order to analyse the impact of this investment on the company in question, a financial analysis was developed, over a period between 2020 and 2024, based on three models: Discounted Cash Flow, Dividend Discount Model, and Multiple Method. Thanks to this analysis, it is possible to catch a glimpse of the future developments that this project will have, thus verifying the benefit or otherwise of this acquisition.

It is necessary, as well as fundamentally important, to bear in mind that the data in the evaluations was taken from the **Bloomberg Terminal** (BBG) and then processed personally. In order to obtain as accurate and consistent estimation as possible, the same sources were used wherever possible, so as to avoid errors caused by the choice of values or indices derived from different studies.

4.3.1 Discounted Cash Flow

The first model used was Discounted Cash Flow, which is based on determining the present value of the expected cash flow for a specific asset. The discounted cash flow valuation is a function of three important characteristics:

- The magnitude of the cash flow;
- The distribution of the flows over time;
- The discount rate.

The basic principle of the valuation process, through the discounting of cash flows, focuses on the determination of these flows and their consistency with the discount rate. The two possible options are as follows:

- The first refers to the use of cash flows available to shareholders, discounted through the CAPM;
- The second takes into account the use of cash flows, discounted through the application of the WACC, available to shareholders and creditors.

Table 1: WACC Calculation.

Y.2023	
NIKE	
Cost of Equity (Ke)	
Ke	10.44%
Cost of Debt (Kd)	
Kd	3.57%
Financial Structure	
Weight of Equity	93.00%
Weight of Debt	7.00%
WACC	9.96%

In order to obtain the Discounted Cash Flow, it was first necessary to make a study of Nike's Income Statement as reported below.

Table 2: Nike Income Statement

Nike Inc. Effective Tax Rate	18.24%
------------------------------	--------

Income Statement NIKE (mln\$)	2020	2021	2022	2023	2024
Revenues	37,403.00	44,538.00	46,710.00	51,217.00	53,708.10
<i>Growth rate of rev.</i>	-4.30%	19.08%	4.88%	9.65%	4.86%
COGS	21,162.00	24,576.00	25,231.00	28,925.00	29,522
<i>COGS margin</i>	56.58%	55.18%	54.02%	56.48%	54.97%
Gross Profit	16,241.00	19,962.00	21,479.00	22,292.00	24,186.10
SG&A	12,007.00	12,228.00	13,964.00	15,518.00	16,112.43
R&D	0.00	0.00	0.00	0.00	0.00
Other Op. Expense	0.00	0.00	0.00	0.00	0.00
EBITDA	4,234.00	7,734.00	7,515.00	6,774.00	8,073.67
<i>EBITDA margin (%)</i>	11.32%	17.36%	16.09%	13.23%	15.03%
Depreciation & Ammortization	1,119.00	797.00	840.00	859.00	890.70
EBIT	3,115.00	6,937.00	6,675.00	5,915.00	7,182.97
<i>EBIT margin (%)</i>	8.3%	15.6%	14.3%	11.5%	13.4%
Financial expenses	228.00	276.00	24.00	-286.00	-106.00
EBT	2,887.00	6,661.00	6,651.00	6,201.00	7,288.97
<i>EBT margin (%)</i>	7.7%	15.0%	14.2%	12.1%	13.6%
Taxes	348.00	934.00	605.00	1,131.00	1,329.51
Net Income	2,539.00	5,727.00	6,046.00	5,070.00	5,959.46

Initially, through BBG GAAP (Generally Accepted Accounting Principles) data standardised for consistent accounting treatment and presentation, the expected growth rates of total sales estimated by the company in the years 2020-2024 were acquired, with which the value of *Revenues* at the end of each year was calculated. The same procedure was done for *COGS* (Cost of Goods Solds), obtaining the amount of Gross Profit as the difference between the two values just mentioned.

A percentage of *SG&A expenditure* (Selling, General and Administrative) on Revenues of 30% was also assumed for 2023-2024 as it remained constant in the previous years. After calculating *EBITDA*

(Earnings Before Interest, Taxes, Depreciation and Amortisation) as the difference between Gross Profit and Operating Expenses, the growth rate of *D&A* (Depreciation & Amortisation) was estimated at 3.75% as the average between the growth of this item in 2022 (2.26%) and 2023 (5.24%).

Consequently, by subtracting *D&A* from *EBITDA*, *EBIT* was obtained, subsequently reduced by *Financial Expenses* to obtain Pre Tax Income also called *EBT*. It's interesting to note how, during the period 2022-2024, these financial expenses dropped significantly to the point of becoming negative. This occurred because the value of Other Non-Operative Income surpassed the Net Interest Expenses, resulting in a substantial increase in liquidity compared to 2020.

Finally, to calculate the *Net Income*, it's sufficient to compute the taxes paid by Nike on its *EBT* (Earnings Before Taxes), using Nike Inc.'s effective tax rate, which stands at 18.24% for this year, and subtract them.

In order to determine the *Free Cash Flow*, it was necessary to estimate the growth rate of *CAPEX* (Capital Expenditures) based on their historical trends (which amounts to 27.84%). Subsequently, the change in *NWC* (Net Working Capital) was subtracted, and *D&A* was added to the *NOPAT* (Net Operating Profit After Tax).

The resulting Free Cash Flows were then discounted using *WACC* as the discount rate, and the *Terminal Value* was determined using the growing perpetuity formula⁶⁵, assuming a constant growth rate of cash flows for each year of its residual life.

The ultimate goal of the Discounted Cash Flow analysis, as evident in Table 3, is to determine the stock price through the present value of expected cash flows. In this case, once the *Enterprise Value* was calculated as the net present value of total cash flows, Nike's stock price was derived by dividing the *Equity Value* (Enterprise Value - Net Financial Position) by the number of shares in circulation (n° share outstanding equals to 1532mln), resulting in a value of \$94.15.

⁶⁵ See Chapter 4, par 4.1.1 Discount Cash Flow Theory

Table 3: Nike Discounted Cash Flow

NIKE Inc. (mln\$)	2020	2021	2022	2023	2024
EBITDA	4234	7734	7515	6774	8074
D&A	1119	797	840	859	891
EBIT	3115	6937	6675	5915	7182
Taxes	375	973	607	1079	1310
NOPAT	2740	5964	6068	4836	5872
D&A	1119	797	840	859	891
Capex	1086	695	758	969	1239
Net Working Capital Variation	1173	-134	1698	88	-211
FCF	1600	6200	4452	4638	5736
<i>Discount period</i>	1	2	3	4	5
<i>Discount factor</i>	0.91	0.83	0.75	0.68	0.62
Discounted FCF	1455	5128	3348	3173	3568

Estimation of EV and Share Price	
Cumulated Net Available Cash Flows	16,672.02
Terminal Value 2024	207,422.68
PV of Terminal Value	129,034
Enterprise Value	145,706.25
Net Financial Position	1,469
Equity Value (Market Cap)	144,237.25
Shares Outstanding	1,532
Share Price	\$ 94.15

WACC	9.96%
G Rate Rev.	7.00%
Debito	12144
Liquidità	10675

4.3.2 Dividend Discount Model

The second method employed was the Dividend Discounted Model (DDM), which states that the value of a stock is determined by the present value of the dividends expected to be received in the periods following the period of analysis. Within an infinite valuation horizon, the stock's value represents a perpetual stream of dividends, where the discount rate applied is the cost of capital (the expected return of other investments available in the market with equivalent risk to the firm's shares). The use of this rate in the model is due to the fact that there is a risk component in the cash flows.

One of the fundamental characteristics of stocks is the uncertainty regarding their maturity. Therefore, to calculate the stock's value within the time frame defined by the DDM, it is necessary to estimate the expected stock price at the end of that period. The primary theoretical limitation of the DDM becomes apparent: the intrinsic value of the stock relies on the estimation of the terminal price, i.e., the value we aim to estimate. Additionally, estimating a company's dividend growth rate can be a complex task. Certain assumptions can be made, or trends can be identified based on the history of past dividend payments to estimate future ones. Nevertheless, even small variations in the expected dividend growth rate can lead to significant differences in the estimated stock price. Finally, if the value obtained from the DDM exceeds the current trading price of the shares, then the stock is considered undervalued; otherwise, it is overvalued.

In Nike's model, the net income, previously calculated with the DCF, is considered over the time frame from 2020 to 2024. Subsequently, it was assumed that the *Payout ratio* for 2023 (40.67%), which is the percentage of earnings distributed to shareholders in the form of dividends, calculated by dividing *Dividend Per Share* (DPS) by *Earnings Per Share* (EPS), would remain constant for the subsequent periods. Furthermore, it can be presumed that the company has a fixed dividend growth rate, which refers to constant cash flows identical for an infinite period without an end date. This allowed for the calculation of dividend values (by multiplying the payout with net income) and the *present value of dividends* (by multiplying dividends with a discount factor that accounts for the cost of capital). The results obtained using this methodology are summarized in the following Table 4.

Table 4: Nike Dividend Discount Model

DIVIDEND DISCOUNT MODEL					
Periods	1	2	3	4	5
Years	2020	2021	2022	2023	2024
Net Income	2,539.00	5,727.00	6,046.00	5,070.00	5,959.46
DPS	0.96	1.07	1.19	1.33	1.52
EPS	1.63	3.64	3.83	3.27	3.73
Payout	58.90%	29.40%	31.07%	40.67%	40.67%
DIV	1,495.36	1,683.49	1,878.52	2,062.11	2,423.88
Discounted Dividend	1354.00	1380.25	1394.56	1386.14	1475.30

Cumulated discount dividend	6,990.24
Terminal Value	183,474.14
PV of Terminal value	111,671.64

Growth Rate (g)	9.00%
Cost of capital (Ke)	10.44%

Price	77.46
Equity Value	118,661.88

Share Price 16/09/2023	96.26
N° Shares outstanding	1,532.00
Equity Value (Market Capitalization)	147,470.32 €

As can be seen from the table above, in order to derive the share price of the company under consideration, the cumulated discount dividend was calculated, such as the PV of the terminal value. Thanks to this procedure, the obtained share price is \$77.46.

4.3.3 Multiple Method

Finally, the last method employed is the Multiple Method, which is used to estimate a company's value by considering the value of other comparable publicly traded companies in the same sector, from which similar cash flows are expected in the future. The prices of comparable assets are then applied to financial data, including Revenues, EBITDA, EBIT, Net Income, Equity, NFP, and free cash flow. An important indicator considered during the analysis is the Enterprise Value (EV), which is the sum of market capitalization (calculated as the product of the number of shares and their unit price) and the net financial position of the company. More generally, in the case of companies with a cash surplus, the Enterprise Value is lower than market capitalization, while in the case of indebted companies, the Enterprise Value will be higher than market value. The EV is related to EBITDA, EBIT, and revenues

(sales) in a way that allows for the subsequent determination of stock prices based on these multiples. The comparable companies used as benchmarks naturally belong to the same sector as Nike, and they include:

- **Adidas:** A multinational company headquartered in Herzogenaurach, Bavaria, Germany, which produces footwear, clothing, and other sports-related items for professional, amateur, or leisure activities. It is the largest sportswear manufacturer in Europe and the second-largest globally. Recently, this giant has also developed investment strategies in NFTs;
- **Under Armour:** Engaged in the development, marketing, and distribution of high-performance sportswear, footwear, and accessories for men, women, and youth;
- **Lululemon Athletica Inc:** Distributes and retails sportswear and accessories for women and men. It operates in two segments: company-operated stores and direct-to-consumer sales;
- **Puma:** A German multinational that designs and produces sportswear and casual footwear, apparel, and accessories, also headquartered in Herzogenaurach, Bavaria, Germany, like Adidas. Puma is the third-largest sportswear manufacturer globally;
- **VF Corp:** A US-based clothing company headquartered in Denver, Colorado, listed on the New York Stock Exchange. It is organized into three divisions: Outdoor, Active, and Work. It is the world's largest company in the workwear clothing sector and controls 55% of the US backpack market.

The process for conducting this analysis using the Comparable Method is shown in the following table:

Table 5.1: Multiple Method

COMPARABLES MODEL 2023 (mln USD)									
Company	Revenue	Free Cash Flow	EBITDA	EBIT	Net Income	Book Value Equity	Market Value Equity (mln \$)	NFP	Enterprise Value (EV)
Adidas	22,231.000	-1,238.00	1,900.00	525.00	712.00	5,351.00	31,226.40	4,925.00	36,151.40
Under Armour	5,903.600	-197.00	421.43	283.81	370.00	1,998.40	3,115.90	809.00	3,924.90
Lululemon Athletica Inc	8,110.500	966.46	1,634.89	1,326.10	854.80	3,148.80	49,340.00	-84.50	49,255.50
Puma	8,859.400	154.70	1,034.10	575.00	353.50	2,538.80	9,790.00	1,074.10	10,864.10
VF Corp	11,612.500	-917.05	1,325.03	1,062.72	118.58	2,910.07	7,060.00	7,336.10	14,396.10
<i>Average</i>									<i>22,918.40</i>

Company	Revenue	Free Cash	EBITDA	EBIT	Net Income	Book Value Equity	N° Shares	NFP
NIKE	51,217.00	4,638.16	6,774.0	5,915.00	5,070.0	14,004.00	1,532.0	1,469.00

The first step involved calculating the EV of comparable companies by adding the net financial position to the market value of equity. This allowed us to determine the value of 4 multiples:

1. **EV/Revenues:** This multiple is used to compare a company's value to its respective revenues. It is the multiple least influenced by accounting policies and tends to be more stable over time. However, it does not take into account a company's profitability or cash flow, which can provide a distorted view of its actual financial performance. A relatively low value of this multiple indicates that the company under analysis is undervalued and is likely to increase in price;
2. **EV/EBITDA:** This is the multiple that finds the most practical use as it relates to the income size, EBITDA, which better than others can express a company's ability to create value through ordinary activities. It is affected less by accounting and tax aspects since it is located in the income statement before all the items related to financial and extraordinary management, allowing for a more accurate comparison between the stock prices of different companies. The main limitation of this market multiple is the existence of a time lag between the numerator and denominator (the ratio between market data and accounting values). Additionally, EBITDA does not take into account income components such as financial and tax components, which can be highly relevant in a financial statement. Some companies may have a positive and high EBITDA value but, at the end of the accounting period, they are incurring losses due to high financial charges and taxes. The lower (higher) the EV/EBITDA ratio is, the more undervalued (overvalued) the company appears compared to its competitors;
3. **EV/EBIT:** It compares the total value of a company with its earnings before interest and taxes. It is a valid alternative to the EBITDA multiple, especially for companies whose assets are characterized by a significant presence of tangible fixed assets. While this multiple takes into account depreciation policies, it is more influenced by accounting rules (making it less neutral in this regard compared to EV/EBITDA). A high ratio indicates that a company's shares could be overvalued. Conversely, a low EV/EBIT ratio can be interpreted as an undervaluation relative to the entire sector.

To the Asset Side multiples, the Equity Side multiples were also added, including:

4. **P/E:** It indicates how many times the stock price incorporates expected earnings and how many times a company's earnings are contained in the market value. The higher the P/E ratio, the greater the investors' expectations for the company's growth. A high P/E value indicates that the market is willing to pay a premium for the level of earnings in the denominator, as it believes in the company's ability to further increase them. In the case of constant earnings, P/E represents the number of years it would take for an investor to recover the invested capital. It is easily calculable due to the extensive availability of necessary information. It is the most appreciated and widely used multiple in the stock market, justified by the fact that a company's ability to generate earnings is its primary value driver. However, it is highly influenced by accounting, tax, and extraordinary policies;
5. **P/FCF:** It compares the market cap of the company to its ability to generate cash flows. It represents the number of times (measured in years) the company would repay the investment with its cash flows. The lower the ratio, the more quickly a company will be able to repay the cost of its acquisition or generate liquidity for reinvestment in its business.
6. **P/B:** It expresses the ratio between the market price of a share and the book value per share (market capitalization/book value). It represents how much an investor is willing to pay beyond the company's book value. It is easily interpretable. Stocks sold at a price well below the book value of net equity are generally considered good candidates for undervalued portfolios. Conversely, those sold at a price above book value are the target of overvalued portfolios.

The next step, highlighted in the table below, was to determine the averages of each multiple. Thanks to these averages, it was possible to calculate the new market value of Nike's equity for each multiple by multiplying it by Nike's reference denominator. The market capitalization obtained divided by the number of outstanding shares determined the stock price.

Table 5.2: Multiple Method

Company	P/E	P/B	P/CF	EV/Revenue	EV/EBITDA	EV/EBIT
Adidas	43.9	5.8	-25.2	1.6	19.0	68.9
Under Amour	8.4	1.6	-15.8	0.7	9.3	13.8
Lululemon Athletica Inc	57.7	15.7	51.1	6.1	30.1	37.1
Puma	27.7	3.9	63.3	1.2	10.5	18.9
VF Corp	59.5	2.4	-7.7	1.2	10.9	13.5
<i>Average</i>	<i>39.45</i>	<i>5.87</i>	<i>13.1</i>	<i>2.2</i>	<i>16.0</i>	<i>30.5</i>

	Share Price					
	P/E	P/B	P/CF	EV/ Revenue	EV/EBITDA	EV/EBIT
Market Cap	199,991.32	82,193.65	55,780.17	109,467.46	106,696.27	178,669.68
Share Price	\$ 130.54	\$ 53.65	\$ 36.41	\$ 71.45	\$ 69.65	\$ 116.63
Average Share Price	\$ 79.72					

4.3.4 Final Considerations

After developing the evaluation of the company in question through the three methods explained above, it can be stated, in light of the results obtained, that all three are sufficiently reliable methods, each with their own criticalities.

- In the Dividend Discount Model, a Share Price of \$77.46 was obtained.
- In the Discounted Cash Flow, a Share Price of \$94.15 was derived.
- In the Multiple Method, the average Share Price is \$79.72

The average Equity value per Share of Nike is estimated to be \$83.78, while Nike's Price per share on September 16, 2023, is \$96.26. These models highlight that Nike's stock appears to be slightly overvalued because the price obtained from the evaluation is lower than its current price.

In the case of the **Dividend Discount Model**, as previously illustrated, the challenge lies in the difficulty of predicting future dividend growth with certainty. Indeed, the estimated price can vary significantly due to even small variations in the expected growth rate. However, this valuation method is considered adequate in light of the fact that the payout, i.e., the percentage of profit distribution, was

58.9% in 2020, 29.4% in 2021, 31.07% in 2022, and 40.67% from 2023 onwards. Therefore, it can be deduced that in 2020, the company preferred to distribute dividends rather than invest them, while in the subsequent years of recovery from the Covid-19 pandemic, with lower interest rates and significant tax incentives for companies, Nike began to invest rather than distribute profits. The model developed predicts that Nike will experience more growth in the future due to these investments.

In the second scenario, through the use of the **Discounted Cash Flow**, the potential limitations of the previously mentioned approach are inherently overcome as it considers cash flows from all investors, regardless of whether they are shareholders or debt holders. This method gives us a very accurate estimate of Nike's share price compared to the market at the moment because it is based on accounting data related to the company's performance, which are much more certain and reliable than equity values.

The **Multiples Method** is the most complex to discuss because, although the average price is in line with that obtained by the other methods, the individual multiples, when taken individually, give a very different price estimation. This method has 3 main limitations:

1. It does not take account of the differences between firms such as the difference in the managerial team, whether they have developed an efficient process or whether they possess patents or new technologies. Therefore, it is tough to establish an adequate set of comparable to find the fair company's value.
2. The second problem concerns the companies chosen for the comparable panel. It is intuitive that the size of other comparable is not as large as Nike ones, especially in terms of revenue and cash flow. Moreover, being a relative valuation model, this model does not allow us to determine whether an entire industry is over or undervalued.
3. when evaluating a company using the multiples model, it is unable to capture the continuously evolving and dynamic nature of the business and competition, as the multiple represents a snapshot of where the company stands at a particular moment.

Furthermore, multiples are based on historical data or short-term forecasts. Valuations based on multiples will, for these reasons, struggle to perceive differences in long-term expected performance.

In conclusion, the price obtained from the application of the three valuation models differs from Nike's current price by \$12.48. The reason for this difference lies in the fact that, from an accounting perspective, Nike deviates significantly from its respective market value.

Being one of the world's most famous multinational corporations, Nike seeks to leverage the significant opportunities offered by the world of technological and digital innovations, thereby gaining a competitive advantage in the market and a strong reputation among investors. Furthermore, through this new strategy, it can optimize all the services it offers, establishing direct contact with customers without the need for intermediaries. Through this drive for innovation, Nike is experiencing significant and exponential growth internally. Indeed, by investing in NFTs, thanks to the acquisition of RTFKT, it has decided to enter a highly innovative new world, becoming a pioneer in its field. The benefits of this acquisition are tangible, even if slower revenue growth in the future is plausible due to the highly volatile NFT market.

Conclusion

In the contemporary business landscape, marked by intense competition, the pursuit of growth emerges as a critical factor for a company's sustained viability over the medium and long term. Consequently, expanding the scale of a company represents both an opportunity for advancement and a strategic response to the challenges posed by the dynamic business environment. Company growth can be realized through two primary ways: internal or organic growth and external growth, each offering distinct advantages and disadvantages.

Mergers and acquisitions (M&A) represent a strategic approach to external growth, notable for the rapid acquisition of valuable resources and capabilities. This stands in contrast to the organic growth path, which typically entails a more protracted timeline. However, it's essential to acknowledge that a successful M&A transaction is often accompanied by obstacles and challenges, both during the initial stages and in the subsequent integration of the two entities involved.

To determine the likelihood of a successful transaction, a thorough evaluation of the target company is imperative. This assessment should consider the strategic and financial objectives that the acquiring company aims to achieve. The prospective buyer must conduct a comprehensive stand-alone valuation of the target company, ensuring that this valuation is based on accurate assumptions. It serves as a crucial determinant in the decision-making process regarding whether to proceed with the transaction or not.

In the last two decades, these operations have become widely prevalent in the corporate strategies of businesses facing an increasingly interconnected and rapidly changing environment. These frequent changes force companies to respond swiftly and flexibly to ensure their survival and establish a lasting competitive advantage. That's why start-ups have become increasingly attractive targets for more traditional corporations. These emerging companies bring innovation, specialized know-how, and ideas that can enable acquiring firms to enter new businesses beyond their current scope. In light of the analyses conducted within this paper, it becomes evident that to foster a thriving ecosystem of start-ups, there must be a similarly robust network of funding entities, namely Venture Capital and Private Equity firms.

Firstly, it has been recognized that engaging specialized financial operators who invest their capital with a medium to long-term outlook allows companies to secure "patient" capital. This patient capital is instrumental in supporting the initial phases of development plans and new strategies in a balanced manner. Secondly, the role of Venture Capitalists extends beyond providing financial capital. They continue to contribute by offering valuable know-how and specialized expertise to benefit the company, thereby facilitating the achievement of development objectives. They aid in raising funds from other investors, improve relationships with financial institutions, and leverage their extensive network of connections to assist companies in internationalization processes and stock market listings. However, the entire world has been completely disrupted by the emergence of Blockchain technology, which has piqued the interest of many companies, both new and established. These firms are aware that it can represent a significant asset to invest in for the future. In fact, blockchain technology possesses enormous potential, as it can make the corporate system not only more secure but also more transparent. It falls under the category of Distributed Ledger Technology (DLT), which enables secure, transparent, and immutable data storage on a network of interconnected computers referred to as nodes. Thanks to its decentralized nature and advanced cryptography, blockchain enables secure financial transactions without intermediaries, eliminating the need to rely on banks or other financial intermediaries. As we have seen in the dissertation, this technology is the foundation of a new economic system concept based on crypto assets, tokenization, and the execution of predefined contracts automatically by Smart Contracts.

Additionally, we can add the creation of a parallel universe to our own, the metaverse, where it's almost possible to do everything, we do in our daily lives but in a virtual world inhabited by avatars. It may seem like science fiction, a utopian future, but this is already the present, and many companies have taken notice. With the boom of NFTs in 2021, these Non-Fungible Tokens, which are essentially packages of data recorded on a blockchain used to prove ownership, authenticity, and uniqueness of physical objects and digital files, have become increasingly desirable for companies and individuals. Their versatility of use (in art, music, gaming, fashion, etc.), along with their characteristics of certifying value, uniqueness, and their ability to be associated with the benefit of a good or service, make NFTs the next promised land for many companies.

Nike is well aware of this, and, along with some of its direct competitors like Adidas, has decided to allocate \$1.2 billion to digital transformation by 2025. Actually, several acquisitions have been made in recent years targeting the data collection and analysis sector, but the most notable is undoubtedly that of RTFKT, an avant-garde digital fashion start-up specializing in NFT collectibles.

The thesis delves into the rationale behind this acquisition, examining it from both a financial perspective, which involves assessing the current share price of Nike compared to prices derived from different valuation methods, and a strategic perspective, by analyzing the factors that led Nike to venture into this universe.

Starting from the outcomes of the financial valuation, which incorporates an average of the DCF Method, Dividend Discount Model, and Multiple Method price, the research calculates Nike's intrinsic value at \$83.78 per share. The price evaluated appears to be lower than Nike's current per share market price of \$96.26, suggesting that Nike may be overvalued by the market. The reason of this difference lies in the fact that, from an accounting perspective, Nike deviates significantly from its respective market value. According to the fundamental market assumption that stock prices will adjust over time to the fair value of the asset, Nike's shares present more of an opportunity for sellers rather than buyers. However, considering all the factors discussed in the thesis, Nike's investment should not be underestimated. A company like RTFKT, operating in an extremely dynamic sector with exponential growth rates, valued at only \$33 million USD in 2022 and able to generate revenues of \$186.34 million in its first year under American ownership, certainly cannot be considered a poor investment. Surely, marketing costs are currently having a great impact on the income statement of Nike, but since this investment was made with a longer-term perspective in mind rather than a short-term one, the increase in future revenues will offset these costs.

From a strategic standpoint, this acquisition aligns with Nike's ongoing digitalization efforts, allowing the company to maintain its leadership in the industry. Furthermore, this acquisition enables Nike to seriously embark on a metaverse conquest campaign, which has already begun with the creation of the Roblox world NIKELAND and the development of their inaugural NFT customizable sneaker collection, CryptoKicks. This would allow for the fusion of the physical purchase of a Swoosh sneaker (Nike's logo) with its corresponding NFT, further intertwining the virtual world with the real one.

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