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eSports Industry Analysis – M&A Case Study of a Fast **Growing Sector**

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Introduction

Always connected, constantly stimulated by innumerable contents, accustomed to a video culture and a very low attention span, these are the characteristics of modern consumers moving in the digital world. In particular, thanks to the development of technologies and the increased coverage of internet networks, all generations, from the Baby Boomers to the younger Millennials and Generation Z, can easily access the 'online' and appreciate the benefits of an increasingly interconnected world.

This technological progress has led the gaming industry to take a leading role in the world of digital entertainment, and many are the businesses with a strong development perspective. More than four out of five internet users, aged 16 to 64 around the world, play video games every day and companies in the industry, as well as those outside the entertainment landscape, see the gaming industry as a unique opportunity to capture new users and increase their market share and brand awareness.

Within this industry, there is one segment that is attracting the most the attention due to its exponential growth. This is the eSports phenomenon, which is of particular interest due to the huge amount of spectators it involves each year and because it represents, due to the strong experiential tools that will be discussed in detail in the first chapter, the best tool to convert young people born in the early years of the new millennium, the target that most interests companies today.

As a result of growing revenues and Key Performance Indicators ("KPIs"), such as the number of users and user profitability, the sector is experiencing a rapid increase from an investment point of view. It is facilitated by the unprecedented performance in 2020 following the restrictive measures imposed by various governments around the world, due to the global Covid-19 pandemic. The pandemic has also created significant chaos in the sector, giving space to important mergers and thus shaking up the M&A market.

In such a changing and dynamic scenario, it is extremely important that the management of companies involved in an acquisition process have the dynamic capabilities to modify their business models and facilitate the integration of the two entities, so as to maximise shareholders value and be immediately competitive with the changing needs of consumers.

The topic object of the following work will be dealt with by examining the eSports phenomenon in all its different aspects, leading to an analysis of a case study in which two different acquisitions will be evaluated, following the real options method in order to settle and measure the synergies of the deals and evaluate the dynamic capabilities of the management. The choice of using the real options method is mainly due to the

unique moment that the gaming market is living. Un-precedent growth, increasing investments and a strong concentration through M&A activities are all characteristics of such industry in 2020, that bring uncertainty and different scenarios about the future. The use of real options give the possibility to assess the effectiveness of an M&A deal, making a comparison between the premium paid for the takeover and the synergies realized.

In particular, the aim of the first chapter is to investigate the eSports market, giving an overall overview of the success and concern factors. After briefly covering the history and defining the phenomenon, the different players in the ecosystem will be analyzed to answer these questions: what are the various business models? What are their profit equations? What is the value chain that links them? The chapter will end with a market analysis, which will give visibility of the evolution of revenues and of the main KPIs of the wider gaming market and in particular on the eSports sector.

The first chapter describes the rise and the affirmation of the eSports phenomenon and the different determinants of this success. In particular, the structure of the sector and the business model of the main operators are highlighted, concluding with an analysis of the market from the revenues and the main KPIs point of view, such as the number of spectators and annual growth. The development of the whole ecosystem has led investors to pay more and more attention to this phenomenon, starting to consider the gaming industry, especially eSports, as a real business opportunity. This trend is confirmed by the increasing number of direct investments within the sector. As a consequence of the exponential evolution of the eSports market, in the second chapter the growing trends of investments in the sector will be deepened and highlighted, with particular focus on M&A. This analysis will be followed by a discussion of the theory behind each transaction, what are the strategic options that a firm has to grow? Which are the main differences between organic and inorganic growth? What makes an M&A transaction a successful investment for the acquiring company? All these questions will lead to the concept of synergies and dynamic capabilities of management, which will be tested in Chapter 3.

From the study of the industry showed in the first two chapters, it is evident that the gaming world is one of the most rapidly evolving of all sectors, but it is also one the most dynamic and insidious one. Companies have to continuously adapt to changes in the interest and perceived value of consumers. Mergers and acquisitions are therefore a valuable tool to react quickly to such changes, but it is not always easy to correctly measure possible synergies, especially in such a changing environment.

Through the real options methodology, in particular with the Black-Scholes Option Pricing Method and the Binomial Option Pricing Method, the objective of the third chapter is to analyze two different deals with both methodologies, in order to measure such synergies by assessing the dynamic capabilities of the acquiring and target firm. Once these synergies are valued and after studying the market reaction on the announcement of deals, they will be compared to the takeover prize in order to state the value creation of the transactions.

Chapter 1

eSports Market Introduction

1.1 'What is eSports, and how aware are people of the eSport culture?'

1.1.1 Definition of Esports

The academic study of competitive gaming requires a scientific definition of what we mean when we talk about Electronic sports ("*e-Sports*" or "*eSports*"). Interestingly, there is currently no generally accepted definition of this term by literature. Most often it is considered equivalent to "professional gaming", a competitive way of playing computer games within a professional setting ¹. Wagner believed that this definition is too narrow and should be redefined. He described eSport as "An area of sport activities in which people develop and train mental or physical abilities in the use of information and communication technologies" ².

He strongly believes that eSport should be viewed as sport, based on Tidermann's description: "Sport is a cultural field of activity in which human beings voluntarily go into a relation to other people with the conscious intention to develop their abilities and accomplishments, particularly in the area of skilled motion"³. Wagner's definition prompt arises some issues. There are three main aspects which are strongly argued. The first consideration comes from the conjunction he makes between "mental or physical", while one of the main aspects which differentiates eSports with traditional sports is the physical side. In all activity physical engagement has to be present to qualify as a sport (World Health Organization, WTO). "While Wagner categorizes eSport as sport, his definition goes against a characteristic which is widely accepted as a necessity for sports" ⁴.

The second issue is that Wagner left out the competition aspect. This is very significant since the eSport industry centralizes around competitions and competitive environment. Competition is one of the main differentiating factors between a leisure activity and traditional sports, so all sports have to include some sort of competition, which results is a winner and a loser. ⁵. Esports are usually highly competitive games and the

¹T. Welch, 2002; cited in Seo, 2013

²Wagner, 2007

³Seo, 2013

⁴Coakley, 2008; Suits, 2007

⁵Guttman, 1978; cited in Jenny et al., 2016

whole industry has been built around tournaments from the beginning. In 1997, there were already multiple gaming leagues that were made based on the US's major leagues systems ⁶. Since then the whole scene got more and more competitive, the last record for the pool prize was USD 34.33 million, settled in Shanghai in August 2019.

Every form of competition requires the presence of certain rules. While in off-line videogames (player vs computer), rules of the game are most of the times based on the original sports, for example FIFA, "*in eSport competitions there are rule books which specify the rules of the tournament event and include what the regulations are towards the players or the team*". ⁷. Regulation, tournament rules and requirement can vary from one league to another ⁸. In South Korea, the government recognized esports as a sport, they themselves are in charge of the regulation of the industry.

To better understand the distinction between eSports and traditional video games it's also important to distinguish between three types of video games: Sedentary Sport Video Games ("SSVGs"). They are video games which imitate real life sports, and the games are based on real life leagues such as UFC, NFL, MLB, NHL and FIFA, but do not have any physical activity included in them ⁹. Most often they are played on consoles, such as Xbox or PlayStation. The second category, eSports, which are not limited to any specific type of game by definition. The most popular esports are not connected to any existing sport, on the contrary they are typically played in a fantasy world ¹⁰. A great example of such a game is League of Legends ("LoL"), which take place in a non-existing world called Summoner's Rift.

The third subgroup of games are the Motion-Based Video Games ("MBVG"). These games are played via Nintendo Wii, X-Box Kinect and PlayStation 4. Oh and Yang in 2010 defined MBVGs as "*any video games that simulate physical ability, including balance, cardiovascular flexibility or strength exercise*".

So, according to recent literature, we can state a complete definition of eSport as a "*form of sport where the primary aspects of the sport are facilitated by electronic systems; the input of players and teams as well as the output of the e-sports system are mediated by human-computer interfaces*" ¹¹. In simpler words is a professional or semi-professional competitive video gaming where individual users compete in an organized format (tournament or league) set by rules, with a specific goal/prize, such as winning a championship title or prize money, using internet or LAN.

⁶Welch, 2002

⁷Jenny et al., 2016

⁸Pizzo et al., 2018

⁹Kim & Ross, 2006

¹⁰Jenny et al., 2016

¹¹Hamari & Sjoblom,

1.1.2 'History of eSports'

As anticipated in the introduction, eSports are becoming more popular every day, but it would be wrong to think that this is a recent phenomenon. The very first known video game-based competition was held on 19 October 1972 at Stanford University in California ¹². Students were allowed to participate in the 'Intergalactic Spacewar Olympics'. The first prize was a yearly subscription to Rolling Stone magazine (not exactly like the millionaire prizes in modern eSports)¹³

But it was with the spread of coin-ops and the first home consoles that the first real championships were born. In 1980, Atari organized the first Space Invaders tournament, one of the most successful titles of the time. Taking inflation into account, Space Invaders is still the highest grossing video game of all time. Over 10,000 players from all over the United States participated in the tournament and it was the first large-scale eSports event.

In 1983, the Twin Galaxies organization, which was already maintaining an archive of the best records achieved in each video game, founded the first eSports team. The U.S. National Video Game Team toured the U.S. challenging gamers to beat team members on different titles. In turn, Twin Galaxies also initiated an actual tournament, the North American Video Game Challenge.

In 1991, the success of Street Fighter II made the idea of direct confrontation between gamers enormously popular. Until then, eSports competitions had been based primarily on achieving the highest score. With Street Figther II, players were able to go head-to-head (at least virtually). This paved the way for a new form of competition, which would lead to modern multiplayer challenges. The success of this fighting game genre led to the birth of the Evolution Championship Series ("EVO") in 1996. This is an annual fighting game competition held in the United States with participants from all over the world.

Other important championships that emerged in the 1990s were the Nintendo World Championships, whose finals were held at Universal Studios in Hollywood, California, and the World Game Championships, organized by Blockbuster Video in collaboration with GamePro magazine. In the second half of the 1990s, computer games, which made more use of the Internet than consoles, entered the eSports scene. In the same period, the Cyberathlete Professional League (CPL), QuakeCon, and the Professional Gamers League were born.

It is since the 2000s, however, that eSports have enjoyed exponential growth, both in terms of players and spectators, and of course also in monetary terms. For example, while in 2000 there were about 10 eSports tournaments worldwide, by 2010 this had increased to 260. Today's most successful championships, such as the World Cyber Games, Intel Extreme Masters (sponsored by Intel), and Major League Gaming, date back to these years.

At the same time, TVs also started broadcasting eSports competitions, with the birth of dedicated channels. The preferred method of users to follow eSports however remains the internet, and in particular the dedicated

¹²Li, 2016

¹³Spacewar is the first video game in the modern sense ever made. It had been developed 10 years earlier at the Massachusetts Institute of Technology (MIT), and sees two spaceships facing each other near a star that constantly draws them in with its gravity.

social network Twitch. In 2018, the platform had 2.2 million monthly broadcasts and 15 million daily active users. In parallel, viewers following live eSports have also grown exponentially. In 2015 the Esports Arena opened its doors in Santa Ana, California, the first facility entirely dedicated to eSports. While in 2018 a second arena joined it on the premises of the famous Luxor Las Vegas hotel.

1.2 Success factors of this trend

1.2.1 Motivational Factors

The most valuable aspect for customers is the experience related to this form of consumption, which is co-created by the marketing actors in the value network. The most striking aspect of eSports for marketers is not its unprecedented growth and global presence. It comes from the nature of value that consumers seek through their engagement with competitive computer gaming. *"When a person buys a service, she purchases a set of intangible activates carried out on her behalf. But when she buys an experience, she pays to spend time enjoying a series of memorable events that a company stages to engage her in a personal way"*.¹⁴

Multiple marketing actors co-create the eSports experience by trying to collaborate with players, government representatives, gaming companies and online communities ¹⁵. There are four type of experience identified by Pine and Gilmore (1998) experience economy and the 4E model. The 4E refer to the four realms of experience which are the educational, esthetic, escapist, and entertainment. All the four aspects are equally important in understanding the experimental value of eSports. Researchers have found that companies and consumers are engaged in co-staging of the esports performance. ¹⁶

Escapism represents a central element of eSports. The consumption of video games is an *"imaginative escape"* representing the aspect of escapism in digital play through nostalgia, daydreams, media-derived fantasies, and virtual tourism ¹⁷. The most important aspect of the escapist experience is that the consumer can affect the performance or events in the real or virtual world ¹⁸. Platforms like Battle.net allowed players to host games together, to start forums and allowed them to connect with each other by creating clans and leagues ¹⁹. Battle.net gave the tools for the players to co-stage the core experience of escapism ²⁰.

eSports tournaments embody the esthetic experience of gaming, where consumers are overwhelmed with the vividness and ludic agency of retail spaces, involving consumers and fans in a 360° experience, acting as a bridge between all players of the industry, including game developers, teams, sponsor, streaming platforms and fans.

In esthetic experience consumers are still immersed within the performance, but they cannot affect the flow of the performance ²¹. All the consumers of eSports, players and viewers can immerse into the competitive eSports culture ²².

The education experience involves those performances where participants are actively engaged but they are

¹⁴Pine and Gilmore, 1999, p. 3

¹⁵Seo, 2013

¹⁶Pine and Gilmore, 1998; cited in Seo, 2013

¹⁷Molesworth, 2009; cited in Seo, 2013

¹⁸Oh-Fiore-Jeoung, 2007; cited in Seo, 2013

¹⁹Dyck- Pinelle-Brown-Gutwin, 2003; cited in Seo, 2013

²⁰Seo, 2013

²¹Pine and Gillmore, 1999; cited in Seo, 2013

²²Christopher-Scholz, 2010; Christopher-Scholz, 2011; cited in Seo, 2013

more outside the event than immersed in the action 23 . Communities are usually built around specific games with the intention of increase consumer's awareness and literacy; they share tactics information and ideas creating communities that want to improve their skills and learn more about the game. These communities often promote tournament and sometimes they even organize tournament themselves. This shows that they are engaging in other types of 4Es as well (entertainment and esthetic) 24 .

The experience we think of as entertainment involve those performances in which consumers participate more passively, where the connection with a performance is more likely to be the one of absorption than of immersion, and which generally occurs when we view a performance ²⁵. Entertainment is one of the most satisfying and outstanding experience, in esports, it is mainly linked with the broadcasting of competitive video games. In most parts of the world, excluding South Korea that has its own television broadcasting network, esports are broadcast via the Internet Protocol Television (IPTV). Most of these online platforms have integrated chat, so a connection can be created between the streamers and the viewers. ²⁶. The entertainment orientation is in the direction of full engagement and co-creation inside the value network, in a way that organizations, consumers and other stakeholders together co-create and grow the experiential value of eSports.

1.2.2 Technological and demographical factors

New Digital 2020 reports – published in partnership with Hootsuite by We Are Social – show that digital, mobile, and social media have become an indispensable part of everyday life for people all over the world. More than 4.5 billion people now use the internet, while social media users have passed the 3.8 billion marks. Nearly 60 percent of the world's population is already online, and the latest trends suggest that more than half of the world's total population will use social media by the middle of 2020. The role of the digital in our lives has reached new heights, with more people spending more time doing more things online than ever before. The number of people around the world using the internet has grown to 4.54 billion, an increase of 7 percent (298 million new users) compared to January 2019.

²³Pine and Gilmore, 1998; cited in Seo, 2013

²⁴Seo, 2013

²⁵Gilmore, 1998

²⁶Seo, 2013

Worldwide, there were 3.8 billion social media users in January 2020, an increase of more than 9 percent (321 million new users) since this time last year. Globally, more than 5.19 billion people now use mobile phones, with user numbers up by 124 million (2.4 percent) over the past year.



Figure 1.1: Digital around the world 2020

App Annie's new State of Mobile 2020 report also reveals that games account for the greatest share of mobile app downloads – more than one out of five of the totals – and drive 70 percent of worldwide consumer spending on mobile apps.

JAN 2020 MOBILE APPS: GLOBAL CATEGORY RANKINGS RANKINGS OF MOBILE APP CATEGORIES BY TOTAL GLOBAL DOWINGARDS AND ANNUAL GLOBAL CONSUMER SPEND										
•	GOOGLE FLAY: 2019 DOWINLOADS			GOOGLE PLAY: 2019 SPEND		IOS: 2019 DOWNLOADS		KOS: 2019 SPEND		
		APP CATEGORY		APP CATEGORY		APP CATEGORY		APP CATEGORY		
	01	GAMES	01	GAMES WO	01	GAMES	01	GAMES		
				SOCIAL Social		PHOTO AND VIDEO		ENTERTAINMENT		
		ENTERTAINMENT		ENTERTAINMENT		ENTERTAINMENT		SOCIAL NETWORKING		
		COMMUNICATION		LIFESTYLE				PHOTO AND VIDEO		
		SOCIAL		PRODUCTIVITY		SHOPPING		MUSIC		
		PHOTOGRAPHY		MUSIC & AUDIO		SOCIAL NETWORKING				
	07	VIDEO PLAYERS & EDITORS		COMMUNICATION		FINANCE WO		HEALTH AND FITNESS		
		MUSIC & AUDIO		ANDROID WEAR		UFESTYLE social		BOOKS		
	09	SHOPPING	09	HEALTH & FITNESS	09	PRODUCTIVITY	09	EDUCATION		
		FINANCE		DATING		EDUCATION		PRODUCTIMITY		
201								we social 🖱 Hootsuite [.]		

Figure 1.2: Mobile Apps: Global Category Ranking

More than four out of five internet users aged 16 to 64 around the world play video games every month, which would equate to a total global gaming community of more than 3.5 billion people if we applied that figure to the total internet user population. Most gamers play games on their smartphones (69 percent of all internet users), but 25 percent of internet users also report playing games on dedicated gaming consoles.



Figure 1.3: Playing Games: Device Perspective

These more "dedicated" gamers spend an average of 70 minutes per day playing console games, but this rises to about 90 minutes per day for console gamers in Thailand, the Philippines, Saudi Arabia, U.A.E. and China. The Newzoo report also indicates that gamers spent more than USD 150 billion on games in 2019, an increase of almost 10 percent compared to the previous year. Similarly, *Statista.com* reports that internet users spent more than USD 83 billion on online game purchases in 2019, up by roughly 5 percent year-on-year. Mobile games are also big business, with App Annie reporting that the world's mobile users spent more than USD 65 billion on game apps and game-related in-app purchases in 2019, accounting for more than 70 percent of total consumer spending on mobile apps in the past 12 months. It is also worth noting that in-app purchases are an increasingly important part of the gaming industry, with *GlobalWebIndex* reporting that 8 percent of all internet users aged 16 to 64 purchased some form of game-related DLC (downloadable content) in the past month alone. People are also spending more time watching other people playing games. One in five internet users aged 16 to 64 watched a live-stream of someone else's gameplay during the past 30 days, while one in seven watched an e-sports tournament.

In total, in 2012–2018, the gaming market doubled, and analysts forecasted that it would grow by another 29 percent over the next three years. The vast majority of the aforementioned USD 152.1 billion is generated by Asia, with China in the lead, where – according to Newzoo – game developers were to generate USD 72.2 billion in 2019, i.e. 47 percent of the entire market. The global gaming market is highly heterogeneous. Currently, mobile games have the largest share, accounting for as much as 45 percent, 80 percent of which are apps downloaded on smartphones, and 20 percent on tablets.²⁷

²⁷https://wearesocial.com/blog/2020/01/digital-2020-3-8-billion-people-use-social-media : :text=Our%20new%20Digital% 202020%20reports,passed%20the%203.8%20billion%20mark.

1.3 Main concerns About eSports

For an institutional system to gain stability, time is an essential factor. Institutionalization means that an activity has extensive history in which: rules settled and made official, formal and structured learning of the game exists, expertise advances, instructors, teachers and governing bodies arise ²⁸. Although the popularity of eSports cannot be questioned, the governing systems and the settings of rules and regulations are waiting to prove their functionality.

The current governing bodies that exist in the eSports industry are commercial firms that organizes the events or leagues in their region. These organizations compete to gain the role of managing the eSports competitive scene. There are countries like South Korea, where the government decided to be involved and they created KeSPA, which is the governing body in Korea when it comes to eSports ²⁹. A potential issue that was pointed out by Hewitt in 2014, was related to the property ownership and copyright within the esports industry that might become a problem in the course of the institutionalization ³⁰.

The constant growth of the eSports industry will make it a necessity that some sort of a governing body would have to be formed, with the power to represent the interest of the industry. There are three big issues with the international regulation of the eSports.

The first issue is that the industry is still in growth and there are many organizations internationally and nationally that are trying to grab the leading role. Until today there is no organization that would fit this role as the Olympic style governing bodies do for traditional sports.

Secondly, it is hard to place eSports technologically advanced model into the same framework that is used for traditional sports. Great example is the broadcasting prospective of eSports, which is done via the internet usually on either Twitch or YouTube. The main concern is that this is not in line with one of the most profitable part of traditional sport consumption, which is the broadcasting rights.

The third issue is with the quickly changing trends within eSports. Some games go out of favor within couple of years, while others can dramatically change in months ³¹. ESports should not use the same model as traditional sports do, instead grow their own league model (Breuer, 2012; cited in Hallmann-Giel, 2018).

1.4 Esports Today. Which is the Esports ecosystem?

"We define eSports industry revenues as the amount the industry generates through the sale of sponsorship deals, media rights, digital, streaming, tickets and merchandising, and publisher fees. Currently, only teams account for digital revenues...Our revenue numbers exclude prize pools and player salaries...The revenue numbers also exclude fan contributions to prize pools...Finally, we do not include capital investments in eSports

²⁸Drewe, 2003; Suits, 2007; Tamburrini, 2000; cited in Jenny et al., 2016

²⁹Thiborg, J. (2009); cited in Seo, 2013

³⁰Hewitt, 2014; cited in Jenny et al., 2016

³¹Holden- Rodenberg-Kaburakis, 2017



Figure 1.4: eSports Value Chain

The above picture shortly represents the value chain in the eSports ecosystem. The "Entire eSports Ecosystem" (EEE) model proposed by Collis (2020) maps all eSports businesses into one of six categories. Based on this EEE model, we subdivide the eSports industry into the following sectors:

1. Game Publishers ("GPs"): They are the companies that produce video games and therefore own the rights to the game and the content they create, which is one of the major points of divergence from traditional sports. While in classic sports competitions such as football, basketball and rugby, the rules are decided by a set of people and bodies operating in a neutral manner, in the case of video games, the manufacturers have the authority, at any time, to change the rules of the game itself and therefore of the competitions. This system has created the need, by the big publishers, to recognize the market strategies and to be able to adapt or, in some cases, disassociate from their productions. A game that has a great appeal to the public not always can become a competitive discipline. In fact, in addition to assessing the mechanics of the game itself, the company that produces it, must also understands what it intends to do with it. The following equation captures publishers of video games business model. They get revenue from direct game sales as well as through microtransactions, ancillary in-play purchases, etc. Regarding the costs,

GPs spend on development and marketing expenses. We describe the esports related profit function of GPs as follows:

Equation 1 - Game Publisher profit equation

$$\Pi_{GP} = \sum_{game,i} [N_{players,i} \cdot (P_i + P_{tail,i} - (C_i + C_{tail,i}) - C_{market,i}]$$

Where Π_{GP} is the Game Publisher profit; $\sum_{game,i}$ represents the total sum over all games, with each game denoted by a given number *i*; $N_{players,i}$ is the number of players for a given game *i*; P_i is the average price paid for the video game *i*; $P_{tail,i}$ is the ancillary revenue for the game (such as microtransaction, expansion)

³²Newzoo, 2020, p. 15

packs, etc.); C_i is the development cost of the game; $C_{tail,i}$ is the license development cost of the tail content; $C_{market,i}$ is the cost of the game.

2. Leagues and Tournaments Organizers ("LTs"): Another key component of the eSports ecosystem are the companies that organize the events, physical or virtual, that are present all over the world, set up and manage competitive events and leagues. They either organize tournaments themselves, paying the rights to the game publishers, or are contracted by the game publishers to organize tournaments/events. On this basis, a company that produces video games and decides to organize tournaments in its own way could take away the possibility for independent organizers to do so. Event organizers are responsible for providing content to the fan communities, opening to new forms of income in the industry, primarily tickets to event areas such as fairs, stadiums, theatres and many other locations. This type of audience is for the most part very active and willing both to travel to attend major competitions on site and to spend on merchandising of various kinds related to the events and teams. In summary, they earn money through sponsorship, ticket sales, broadcasting rights and direct prize pools winnings. Most of these entities are still disassociated to one another, however, in recent years, they are opening to collaboration with each other in order to provide a better experience for both the public and the athletes at the various competitions. Leagues and tournaments organizers, despite their centrality in the eSports ecosystem, still have problems to monetize through their actual business model, even if a large amount of turnover pass through them. LTs also do enjoy franchising revenues, which can be substantial in any given year. Therefore, in leagues and tournaments profit equation, we also include a fixed franchise term, T, equivalent to the average annual franchise fees paid per year in eSports, enabling LTs profit to be captured as:

Equation 2 - Leagues and Tournaments profit equation

$$\Pi_{LT} = F(N_{watchers}) - C + T$$

Where Π_{LT} are the LT profits; $F(N_{watcher})$ is the increasing function of the numbers of viewers and includes ticket sales, pay-per-view rights, merchandise or sponsorship; C is the cost of organizing and managing LTs (e.g. renting venues, organizing events, attracting talent, etc); T is the fixed franchise fee.

3. Teams, Professionals, and Streamers ("TPS"): They are the equivalent of traditional sports clubs that host professional players, attract fans and participate in events to compete. These organizations manage the teams within the various competitions and often have more than one team at their disposal, on different games and platforms. In addition to gathering talent and bringing them to major competitions, they have a great interaction with their fans, through events and the production of gadgets, clothing and much more, which young fans are often willing to buy, as with traditional sports teams.

One of the biggest problems for the emergence of new, solid and well-organized teams is the search for sponsors and funds in general, as it is currently difficult to distinguish well-structured realities from those

that only have a good appearance, in fact, the entire sector is still mutating very quickly, making it almost impossible to define fixed parameters to orient oneself among the various realities present. Teams monetize what they do through sponsorship, merchandise, prize money and player exchanges. For a particular TPS, their profit function can be described as follows:

Equation 3 - Team, professional or streamer profit equation

$$\Pi_{TPS} = \sum_{game,i} \{ N_{viewer,i} \cdot [P(play|watch) \cdot P_{average,i} + P_{donation,i}] + \Pi_{winnings,i} - C_{tools} \}$$

 Π_{TPS} are TPS profits; $sum_{game,i}$ is the total sum over all games, with each denoted by a given number i; $N_{viewers,i}$ is the number of viewers for the particular TPS for a given game i; P(play|watch) is the conversion probability that someone who watches the game plays it as well, or will play it; $P_{average,i}$ is the expected revenue per player of the game (from microtransactions, expansion packs, etc); $P_{donation,i}$ is the average donation per viewer for a specific game; $\Pi_{winnings,i}$ is the prize winnings for a TPS for a game; and C_{tools} are the total costs for a TPS (including games, various ancillary hardware, and software tools). The above equation captures the following business model: TPSs earn revenue either directly from viewers in the form of subscriptions or donations and in the form of advertising from other companies of the ecosystem (as game publishers). or due to eSports winnings, while their outlay is primarily tools, such as games and streaming hardware. These companies pay TPSs to advertise their products or services to their viewership audience. As such, the critical element that secures advertising and sponsorship revenue is the combination of the TPS' viewership population and the TPS' potential ability to convert them into Players.

4. Streaming Platforms ("SPs"): They mainly distribute and broadcast video game content, from individual player streams to major competitions. Some professional teams and event organizations have exclusive agreements for their content with individual platforms. The distribution of content, especially live, via the web with specialized services has opened the door to new forms of business, allowing streamers, as well as pro players, to gain fame and sponsorship deals. Whether the future will be on the web or on the classic channels already dedicated to sports is still hard to say, but, at least for now, videogame fans prefer to watch their idols sitting in front of their PCs rather than on a comfortable sofa.

They earn money through advertising and subscriptions from those who generate content on the platform itself. The broadcaster also helps content creators (events, developers, streamers) to get views, and can assist in the strategic promotion of events. However, they are responsible for maintaining a stable platform for millions of viewers watching multiple events at the same time from a variety of games.

Equation 4 - Streaming Platform profit equation

$$\Pi_{SP} = \sum_{streamer,j} [(N_{viewer,i} \cdot P_j - C_{market,j}) - C_{development}]$$

 Π_{SP} are SP profits; $\sum_{streamer,j}$ represents the total sum over all streamer; with each streamer denoted by j; $N_{viewers;j}$ is the number of viewers for a particular streamer j; P_j is the average portion taken from the subscriptions and advertising payments for a particular TPS; $C_{market;j}$ is the value transfer from the SP to the TPS to incentivize streaming on the platform; $C_{development}$ is the development and maintenance cost for the platform itself.

The above equation captures how streaming platforms generate revenue from viewers of their gaming content, who spend on subscriptions and are exposed to advertisements. SPs outlays are in development costs or their platform (or other costs, such as analytics, etc.) and marketing, or payments to TPSs to stream on their particular platform.

- 5. Sponsor: They are the companies that spend money in the eSports ecosystem to generate new customers (millennials are the preferred target). These brands are responsible for the large amount of sponsorship money that flows through eSports and account for much of the way teams and events generate revenue. Brands that invest in teams usually look for product ambassadors: such as logo placement on team uniforms or social media platforms. Brands that sponsor events are likely to focus more on the overall brand or product placement. It's difficult to state a profit equation because the main return on their investments is linked with the brand awareness and other intangible benefits.
- 6. Fans: They are the backbone of the ecosystem; everything rotates around them. They encompass an audience that mainly ranges from 12 to 40 years old, very often willing to move and spend to follow and support the phenomenon. As proof of this, many events have filled stadiums and arenas with thousands of seats, not to mention the millions of views on the various event distribution channels. Their participation ranges from attendance at events, on site, to paid subscriptions to players' or streamers' channels, often followed by donations. The income generated by the purchase of products and equipment related to the world of video games has recorded incredible peaks in recent years when the competitive branch has also taken hold in Europe and America, slightly behind Asia. The peculiarity of this type of audience is certainly sportiveness, in fact, very often people support a certain team in one game while, in another, they support a different team, this allows to have crossed fans and thus ensure a healthy competition environment far from the risks of sports fans.

1.5 Market Analysis

After having investigated the main reasons of success and concern behind the gaming world, with a particular

focus on the eSports phenomenon, the following paragraph aims at giving an overview on the evolution of the sector from an economic and financial point of view.

For the purposes of this analysis, the market will be divided into 2 segments: TAM and SAM. The TAM (Total Available Market) segment represents the broader gaming market, while the SAM (Serviceable Available Market) segment constitutes the reference category, i.e. eSports. For each segment, the total revenues and their sources are analyzed, in order to give visibility to the most profitable businesses, as well as the evolution of some Key Performance Indicators ("KPIs"), including the number of users and viewers, indicating their geographical and demographic distribution.

1.5.1 Gaming Market

The general trend is that more and more companies are interested in approaching and entering this sector. This is a rather vast and constantly evolving market, with enormous potential to be exploited in terms of growth. However, even though the trends are growing in all segments, different dynamics can be appreciated within the sector: while the Mobile segment has been characterized by considerable profitability in recent years, the Console and PC areas, although growing, are recording more limited levels. This can be interpreted as an indication of a current revolution in the sector: that of innovation and player involvement. Over the last 15 years, the market has been inflamed by the battle between console and PC gaming, particularly within the big players (e.g. the rivalry between PlayStation and Xbox, respectively by Sony and Microsoft). A competition for the best technology to guarantee an innovative gaming experience has been established, with less attention paid to the games themselves and to the needs of the new generations.

Mobile has grown rapidly to become the largest gaming segment, but its role in the eSport scene is still developing. This success is because screens now are everywhere, competitions can be viewed anywhere and at any level, and the industry's big publishers are capitalizing on this factor. In fact, the most popular game now, Fortnite, after the enormous success achieved both when playing on PC and on Console, is also available on mobile devices (iPhone and iPad). With this initiative, Epic Games will allow its players to join and play together even on different devices. Moreover, thanks to an agreement reached with Sony, Fortnite will also be available on PlayStation 4 and you will be able to share your progress with PC, Mac and Android ³³.

When looking in detail at the different trends and characteristics with respect to PC/Console and Mobile, distinct but equally successful paths to success are identified. Indeed, as shown in Chart X, the numbers are growing, but at markedly distant rates, with Mobile's exponential growth enabling it to rapidly increase its percentage share of the entire industry.

³³Grasso, 2018



Figure 1.5: Global Video Gaming Market Growth 2012-2025 (USD Billion - Newzoo

Taking our TAM into consideration, the global games market is worth USD 165.9 billion in 2020, registering a growth of 9.2% compared to 2019 (Newzoo). These figures confirm a consolidation for the gaming industry mainly due to the growth of the Mobile segment (+52%), significantly higher than the growth of Console (+25%) and PC (+24%) segments. This trend means that PC and Console losing ground in terms of market share compared to Mobile. In fact, PC and Console are down 11.1% and 7.4% respectively in terms of overall market value. For 2020, mobile revenues are \$94.6 billion, or 56% of total revenues, while console and PC revenues are \$38.2 billion and \$34.8 billion, or 23% and 21% of total revenues, respectively.



Figure 1.6: 2020 Global Revenues Distribution by Product (USD billions, Newzoo)

According to Newzoo's estimate, the mobile segment will grow to USD 106.4 billion by 2021, accounting for 59% of the total, making it the industry's leading segment. The mobile market is a market that rarely earns money directly from the sale of games, as its main source of revenue is microtransactions. Mobile games, in fact, are often available on a free basis and only require payments to acquire specific bonuses or upgrades. These transactions directly charged to the user's mobile phone credit represent a marginal expense for the individual player, but bring considerable revenue when the size of the audience is considered.

The size of the global market in terms of users is 2.69 billion active players by 2020, a figure that Newzoo says will grow to 3 billion by 2023.



Figure 1.7: Number of active video gamers worldwide 2015-2023 (billions, Statista)

Regarding the geographical distribution of revenues, Asia Pacific holds the largest share of the market, thanks to the leadership of the Chinese market, which alone represents 48.2% of the total market, for a total amount of USD 84.3 billion. In second place we find North America with 25.5% (USD 44.7 billion), followed by the European market with 18.8% of the market (USD 32.9 billion) and finally Latin America and Middle East & Africa, with 3.9% and 3.5% share of the gaming market respectively.



Figure 1.8: 2020 Global Gaming Market Revenue Breakdown by region (Newzoo)

1.5.2 eSports Market

The eSports market has also witnessed sustained growth in recent years (Figure 10). In fact, revenues in this market segment have increased from USD 655 million in 2017 to the expected USD 1.5 billion in 2021, representing a CAGR of 23%. These revenues are driven by a consistent increase in the number of viewers and fans, which amount to 495 million by 2020.



Figure 1.9: eSports market Revenue Streams (Deloitte, 2020 – USD Millions)

Figure 11 shows the distribution of revenues by product, as anticipated in the previous paragraphs, sponsorship revenues represent the largest source of stream revenues, followed by media rights, the various advertising on streaming platforms and finally Game Publisher Fees and Merchandise & Tickets, a business line that has yet to establish itself within the ecosystem.



Figure 1.10: eSports market 2020 revenues distributions (Newzoo)

The increased sponsorship is due to the growing number of viewers attending tournaments and on the various streaming platforms. These viewers have increased from 335 million in 2017 to 495 million in 2020, representing a CAGR of 13.9%. The global audience is expected to reach 644 million viewers by 2022. Newzoo distinguishes eSports viewers between occasional viewers and eSports enthusiasts. Occasional viewers are people who watch professional eSports content less than once a month, while eSports enthusiasts are people who watch professional esports content more than once a month (Newzoo, 2020).



Figure 1.11: eSports Global Audience Evolution forecasts to 2022 (Newzoo – Millions)

Such a considerable increase in viewers represents a unique opportunity for non-endemic³⁴ companies to gain visibility on a very difficult target audience to attract, i. e. millennials. If we put advertising and brand sponsorships in a single basket of money flowing into esports from marketers, they currently account for 59.0% or \$645.9M of the total estimated \$1.1B eSports industry in 2019.



Figure 1.12: eSports market digital advertising and sponsorship growth (Echelon – USD Million)

Echelon Wealth Partners, in their 2019 eSports report, share the general view that the popularity of eSports has not yet reached its true potential size on a global basis. Further sources of revenue are expected from additional eSports franchises, merchandising and in-game spending. New content models such as freemium models and innovation in big data are expected to generate increasing revenues given the leverage of audience monetization. In addition, positive technology tailwinds driving the entire industry will enable a more interactive

³⁴Non-endemic companies in eSports field are those companies which value proposition is not directly linked to eSports, but however are increasingly gaining from a market strategy dedicated to eSports. Examples are DHL, Vodafone, Ziggo and Mercedes Benz partnering with eSports to access growing audience ³⁵.

experience and result in a much wider reach. In the future, 5G for mobile, which is currently not available, will essentially enable cloud gaming by providing even richer content and a more interactive gaming experience.

Chapter 2

Theoretical Literature

2.1 Rationales of Gaming market growth and M&A trends

In a highly competitive entertainment landscape, the main players of the industry are actively looking for any edge to gain market share (and mindshare) among video game consumers and enthusiasts. eSports represent a unique and new way for companies to attract and retain loyal fans over a longer period.

If, on the one hand, competitive pressure leads to a constant search for new development opportunities to increase the distance from the main competitors, on the other hand, the structure of the market itself pushes towards ever-increasing dimensions, without which it would be difficult to achieve dominant positions and significant results.

Sometimes growth can be interpreted as an imperative necessity rather than a rational and voluntary strategic choice. In any case, it does not represent a generally valid behavioral model, even if in the long term it is difficult to think of business situations in which success can be achieved without responding to growth stimuli.

Throughout the life cycle of each company, there are phases of evolution and revolution with varying and discontinuous cadences, there are times when the company finds itself operating in difficult and crisis situations, which can be tackled by restructuring measures or by an overall review of the strategic set-up, but even at these times, although the objective is to recover from a problematic situation, decisions are taken according to the objectives of subsequent growth and development.

The drive for growth is linked to the change in the reference economic scenario, which at certain times imposes the need to revise strategic models, leading companies to make a sudden change. The recent pandemic provided a concrete example of how important is to have a lean corporate structure that is adaptable to changes in the socio-economic context. In recent years, the basic criteria for being able to compete successfully have changed radically: suffice it to think of the replacement of the model of the tangible company, the company-factory, with the model of the dematerialization and online company, which is more inclined to value mainly the needs and expectations of consumers.

In fact, if the success of a company is increasingly conditioned by factors of an intangible nature, the ability

to seize growth opportunities in line with market dynamism and to develop the ability to allocate resources according to new schemes becomes important. The fastest way to gain market share concerns the inorganic growth, and so the M&A transactions.

Mergers and acquisitions are part of the strategic decisions of the company, therefore, the decision to acquire should be the result of a planning activity that, through external growth, leads to the achievement of certain objectives. In this respect, external growth operations represent an effective tool for strategy implementation. Growth objectives can be achieved not only through external growth but also through internal investment. However, companies may not have the time or internal expertise to achieve these objectives in the desired manner.

External growth in the strict sense of the term is understood to mean transactions carried out through the acquisition of shares or assets of other companies, control of which passes to a new entity, the acquirer. Through acquisition transactions, companies undertake a path of external growth by taking over the controlling interest of another company or its business. Such transactions make it possible, for example, to:

- 1. expand into other markets;
- 2. acquire a technology or product;
- 3. increase volumes, such as turnover, margins and profits;
- 4. to eliminate a possible competitor by incorporating it;
- 5. obtain high financial benefits.

In any case, external growth operations are very delicate, and M&A operations are rarely observed to be carried out with extreme simplicity. Complexity is linked to factors of a different nature, such as:

- difficulties in assessing the company's overall strategic plan;
- problems in negotiating with counterparties
- management difficulties after the acquisition;
- other exogenous factors that are sometimes difficult to assess.

A further aspect that deserves consideration relates to the fact that in times of crisis and difficulty larger companies show a greater capacity for survival than smaller companies.

In recent years, M&A activity has been very lively in the video game industry and an increase in transactions can be expected in the future. Through these transactions, video game companies are able to access market segments without developing new business areas internally, but above all they are able to respond quickly to changes in the market and consumer needs. Through M&A transactions, growth is made possible for both the acquiring companies and the broader video game industry, creating attractive investment opportunities.

Figure 13 below shows the total value of M&A and IPOs from 2017 to YTD ("Year To Date"), 8 March 2021, as well as the number of transactions completed during this period. 2020 and 2021 were record years for the total amount of transactions, the amount being \$48.6 million for 2020 and \$63.7 million for 2021 YTD, compared to \$18 million in 2019. Contributing to such a sudden increase in the total amount of investment in the eSports sector is undoubtedly the Covid-19 global pandemic, which, through restrictions such as lock downs and other social distancing measures, has forced most of the world's population to stay indoors, with a consequent increase in hours spent on gaming content.



Figure 2.1: Global M&A and IPO transactions in the eSports market (CBInsight – USD Billion)

Among the acquiring companies in the video game industry, many mainly aim at expanding their total available market, a parameter that affects the number of consumers using the games offered by a given company. Theoretically, a larger market drives more people to use a given company's game(s), which increases potential revenue growth and user engagement levels. In fact, as shown in Figure 14, game publishers and big tech companies are the ones most interested in acquiring other companies in the industry, either because they have more money or because they want to consolidate and grab as much market share as possible in a rapidly growing industry.





Figure 2.2: Largest Acquisitions in Video Gaming sector by deal value (USD million)

Looking in detail at which entities are most interested in investing in the eSports sector, we see that:

• Traditional sports teams

Professional sports clubs view eSports as a new chance to diversify their revenue streams and capture new users in transversal way. Most prestigious professional football and basket clubs in Europe and US have founded paralleled team under own brand, engaging professional gamers to represent their respective club in eSports competitions. The race to sign the best gamers is expected to intensify and both sports clubs as corporate brands willing to enter a new revenue stream.

Private Equity / Venture Capital firms

Investment firms, as the rest of the world, see the gaming industry as one of the fastest growing industries. With ever increasing amounts of sponsorship and advertising dollars and a global fan base that is becoming more engaged than traditional sports fans, eSports represents a young industry exploding with exponential growth. This represents unique chance for most tech investors.

• Media groups

Another group that finds relevant synergies with eSports and gaming organizations are media groups that are looking to diversify their revenue streams. These groups, such as YouTube, operate other digital entertainment mediums via the internet and recognize the trend of consumer entertainment shifting towards gaming video content and eSports. To gain market share in a nascent industry, these media groups are acquiring eSports teams, talent agencies, and related technology companies.

2.2 M&A Definition

Mergers and acquisitions are extraordinary financial operations, which companies use to achieve dimensional development. According to the prevailing approach in the literature, acquisitions and mergers are examined and considered together, referring to M&A activity and identifying them as a way of growth through external means. In reality, they represent very different forms of firm concentration, each with different characteristics depending on the degree of concentration and the type of transactions carried out. Takeover, merger, and acquisition are frequently used synonymously, although there is clearly a difference in the economic implications of takeover and a merger ¹. A merger occurs when one company, called the acquirer, intends to merge with another, called the target, combining into a new entity. This is considered a true integration between the companies involved. Hampton (1989) claimed that "a merger is a combination of two or more businesses in which only one of the corporations survives". An acquisition, on the other hand, occurs when the acquiring company acquires a controlling interest, a business or part of a business, for a price, in which case a transfer of ownership takes place.

Although, from a strategic point of view, the two operations can be compared, they present further differences, linked to the persistence or otherwise of legal independence.

Acquisition is the process by which the bidder company acquires all or part of the share capital of the target company, maintaining its legal independence after the transaction. An acquisition is defined as a full acquisition if the bidder obtains the entire share capital of the target, or a partial acquisition if it concerns only a share of the target.

As regards the merger, we mean the formation of a single economic unit from two or more previous undertakings, a true integration of the activities of the undertakings under consideration. Hampton claimed that

¹Singh, 1971

"a merger is a combination of two or more businesses in which only one of the corporations survives"². Here, the companies lose their legal individuality and merge into a single organizational structure.

2.3 Different types of M&A

Following the classification logic proposed by Joseph L. Bower, we can distinguish the transactions under analysis into five different types, based on the motivation behind the transactions:

- 1. The overcapacity M&A: these are transactions carried out in response to mature, capital-intensive sectors and to an operating context characterized by a situation of overcapacity. In these circumstances, the company is faced with the choice of acquiring another company to avoid being acquired: the operation will allow it to rationalize processes, eliminate uncompetitive structures and improve efficiency at the same time, alongside greater market power. However, it is not uncommon for critical issues to arise that can frustrate the potential of the operation. Cultural differences, for example, can be an obstacle to a successful deal, as well as differences in the operational processes of the two merged organizations. Therefore, it is of fundamental importance to be aware that an adequate integration plan has to be put in place and that certain resources and values cannot be undermined.
- 2. The geographic roll-up M&A: in contrast to the previous case, M&As falling into this category occur in fragmented sectors that are much less mature than their life cycle. This is a circumstance in which no one company dominates at a regional or national level and, organizations with successful strategies, expand geographically, acquiring similar entities in adjacent locations. The purpose associated with this type of intervention is the search for optimization between operating costs and greater value for customers: they are operations driven by the desire to achieve economies of scale and scope, as well as the vision of establishing a big player. Given the importance of the customer in this type of operation, it is essential that a situation of mutual understanding exists between the acquiring company and the target company, and that each change is made gradually in order to maintain a balance between the two organizations that does not affect the value offered to the consumer.
- 3. The product or market extension M&A: this type of transaction aims at extending the product range of a company or its presence at international level. Sometimes similar to the previous ones, this type of M&A differs by involving agreements between big players and by being oriented towards completely different and not always adjacent territories. The critical issues that can emerge in the acquisitions under analysis can be traced back to the same ones found in overcapacity M&A (i.e. the problems related to the integration of processes and the imposition of new values between two companies that are large in size, with their own and already consolidated processes and methods). On the other hand, when the deal

²Hampton, 1989

involves a large player wishing to acquire a smaller company, the chance of the deal being successful is considerably higher. Involving companies from very different countries, particular attention must also be paid to the different regulations of the target company, as well as cultural differences, which - in this context - are certainly more intense. Above all, a careful study of the target company, its processes and critical success factors plays a key role.

- 4. The M&A as R&D: this category includes those operations aimed at reducing the response time to the market. These are acquisitions made by high-tech companies in order to compensate for the increasingly short life cycle of their products. Thus, instead of implementing research processes internally which would require long lead times incompatible with the necessary reactivity of these sectors they decide to acquire companies already developed in the field. In this type of deal, as mentioned above, speed is essential: the integration process must be as well and, for this, the acquiring company must be able to effectively and efficiently transmit its values and vision.
- 5. The industry convergence M&A: M&A transactions belonging to this last category are characterized by a radical reconfiguration and imply the creation of a new industry, betting on the blurring of boundaries between different sectors, as well as on the fact that the new business model may allow the achievement of greater synergies. Forecasts and preventive analysis are very difficult to carry out and the success of the operation seems to depend in addition to the capacity for integration of the entities involved on the "good eye" of the entrepreneur. The elimination of processes and operations that are symmetrical after the transaction remains one of the fundamental objectives to be achieved in the integration phase. However, it is vital to embrace a vision that is extremely flexible and aimed at value creation, moving away from the feeling of certainty that maintaining the usual mechanisms tends to give.

2.3.1 Horizontal vs Vertical Takeovers

In the context of M&A transactions, an initial subdivision is made according to the strategic objectives that the acquiring companies intend to achieve in acquiring a given company, with reference to the sector to which it belongs. The fundamental distinction is between correlated and non-correlated transactions; in the first case, the companies involved operate in sectors that are more or less closely connected in terms of technology, product, or market; conversely, in the second case, there are no such connections.

Related transactions can in turn be divided into horizontal and vertical acquisitions. In this respect, when the acquisition concerns a company operating in the same industry, it is called a horizontal acquisition, or a concentration strategy, since usually the two companies, acquiring and acquired, compete in the product market prior to the acquisition ³. The firm therefore wants to preserve its acquired competitive position by making it more difficult for potential new competitors to enter the industry.

³Ross et al., 1996

This type of transaction leads to an increase in the concentration rate and a consequent reduction in the competitiveness rate of the market. The immediate effect of a horizontal acquisition is to increase the market share of the acquiring company since, as can be easily guessed, it will absorb the share of the acquired company, thus strengthening its position and market power. In addition, horizontal aggregation between homogeneous firms thus allows for greater bargaining power vis-à-vis suppliers or on the final offer. The development of a company through a merger strategy is implemented when the acquiring company decides to grow in the sector in which it operates by exploiting the skills and experience already acquired.

This type of M&A is one of the most common approach because it is believed that when two companies operate in the same sector, it is relatively easier to achieve integration between the two structures, the implementation time is shorter, and it is easier for the entrepreneurial bodies to keep risks under control. In summary, the objective of horizontal integration is to increase the relative market share of the company and thereby strengthen its position and market power.

The acquisition of a company which, on the other hand, operates at a different level of the same production chain (i.e. the acquisition of a customer or supplier, or of a company producing complementary products), is called a vertical acquisition, or integration strategy. In this case, the companies involved carry out different stages of the production and distribution process of the same product. Integration means the internalization of certain business activities involving the upstream and/or downstream company, in other words, the acquiring company through an integration strategy can perform an activity that was previously outsourced. In this case, we have an extension of the activities forward towards the markets of final placement of the products, or backward towards earlier stages in the path of value creation.

These types of transactions allow the acquirer to have greater control over some of the variables and elements in the production chain, reducing possible cost overlaps (giving rise to so-called synergies), risks and costs and thus increasing its power over the entire value chain. The acquiring company thus has more opportunities to enter new upstream or downstream businesses and increases the possibility of taking advantage of new technological forms for existing businesses.

On the other hand, however, there are some negative aspects, such as reduced flexibility of diversification and less possibility to address different distributors and suppliers ⁴. In contrast to the previous type, it is less common because of the greater difficulties involved in its implementation

Finally, unrelated transactions include conglomerate acquisitions, or purely diversification acquisitions, to indicate the union between two firms with a portfolio of activities that are not directly related, in other words, a merger between firms not from the same sector. If the acquiring company has the necessary resources to carry out a diversification strategy, this becomes the option that can boost the bidder's momentum.

Through this type of transaction, the acquiring firm can diversify market production, achieve economies of scale and economies of scope, and acquire new and advanced technologies.

⁴Hax, et. al., 1991

2.4 Friendly vs Hostile Takeovers

Acquisitions can take place in two different ways: accordingly, or through hostile takeovers; the latter is only possible if the target company is listed, and no shareholder controls an absolute majority of the shares.

Hostile takeovers represent a real attack on shareholders and a threat to the target's management as they bring about significant changes in strategy and organizational structure⁵. In this case, there is a high degree of conflict between the management of the two companies and the acquiring company, instead of seeking approval from the management of the target company, turns directly to the equity holders. This can be extremely risky both for the successful outcome of the transaction, the price to be paid to obtain control and the negative implications for the subsequent integration phase ⁶.

Sometimes, however, transactions that start out as hostile are later transformed into friendly, or almost friendly, transactions, because there is a common interest in ensuring that the transaction takes place with minimal damage. When we talk about friendly takeovers, usually, the acquiring company turns to the management of the target, seeking its approval of the transaction.

Generally, the management of both companies, acquirer and target, will try to work together to agree on the terms of the transaction and how it will be handled after the acquisition. In some cases, the target's management may even perceive the acquisition as a source of new wealth creation and opportunities.

2.4.1 Entire Business vs Business Units Takeovers

The acquisition of control of a company can be implemented in different ways:

- purchase of the whole company, acquisition of the company, all the individual assets and liabilities of the target company are acquired;
- purchase of a shareholding, a stake, representing the capital, with subsequent exchange for cash, other shares or other securities;
- purchase of business units;
- purchase of specific assets.

Increasingly frequent are the cases in which partial acquisitions are carried out (i.e. the acquisition of so-called company branches, such as parts or sectors of the company which are sold to an economic entity interested in incorporating them into its own organizational structure).

The rationale behind the decision to acquire business units lies in the fact that what is no longer of interest to

⁵In hostile situations, the risk of paying higher prices than in a friendly context may depend on three factors: the possibility of competing bids, the impossibility of knowing the real value of the target company, as we are unable to find information other than public information, and the pressure to conclude the negotiation, which leads to neglecting important aspects such as determining the real value of the target.

⁶Rosenbaum, 2009

a single company may, on the contrary, be of interest to other economic players. This reasoning shows that the value of certain business units can be assessed subjectively, in a way that differs from person to person, according to the needs and requirements of each operator. In fact, there are frequent cases in which business activities that are currently unprofitable for a company may have a significant value for other operators.

The acquisition of business lines concerns:

- individual products or product families divisions;
- specific production facilities;
- commercial networks;
- partial combinations of the previous activities.

Of course, in addition to the interest shown by the buyer of business units, there must also be a condition that it is possible to spin off the business to be sold, which is not always easy to achieve. The advantages of this operation include the speed of implementation of the project, the achievement of productive and commercial synergies, the low risk of failure and the limited financial outlay ⁷

2.4.2 Types of Mergers

A merger of two or more companies can be carried out by setting up a new company or by incorporating one or more companies into a single company.

The main types of mergers can be

- Proper merger: two or more companies merge into a single entity, usually partnerships that want to become corporations, in which case the original units stop existing, thereby ending their previous legal existence. A completely new corporate entity is created, where the merged companies become part of it. The total assets are made up of the combined assets of the merged companies. The shareholders of the original companies will be allocated, based on a certain exchange ratio, shares or units issued by the new company in exchange for their old securities. It is used when the relationship between the companies is equal, but it is not widely used.
- Merger by incorporation: in this case there are one or more companies, called incorporated companies, which are absorbed into a single entity called the acquiring company, here not all the units involved are extinguished, but only the incorporated ones, the acquiring company, in fact, retains its name and identity, while the incorporated companies cease to exist as a separate business activity. The shareholders of the acquiring company, while be allocated, based on an exchange ratio, shares or quotas issued by the acquiring company, which will then increase its share capital, while the securities of the acquiring

⁷Conca, 2010.
company are cancelled. This type is used when there is a dominant party, a leading company. This is where the acquiring company succeeds to the rights and obligations of the companies being acquired. This is the most common form of merger 8 .

There may be advantages and disadvantages of merger over acquisition ⁹. The advantages include:

- Merger is more straightforward and less expensive than acquisition;
- Mergers are preferred when a strong economic and production integration is sought;
- A concentration process can be implemented with a limited monetary outlay;
- A merger maintains the involvement in the management of the old ownership of the acquired company.

The disadvantages, however, may be:

- The merger must be approved by the shareholders' meetings of both companies;
- The approval procedure can be lengthy and costly;
- It may require major difficulties for effective integration;
- It has a more complex procedure.

2.5 Organic vs Inorganic Growth

As mentioned above, the various growth strategies can be developed along two lines: internal and external. To better clarify the concept of external and internal growth, it is useful to highlight the characteristics of both options.

Internal growth consists in the direct (or in-house) realization of new investments and the development of new activities, using skills, competencies and human, technological, and financial resources that are already within the company. Usually, internal growth involves the expansion of the existing structure, allows a gradual change in size, allowing decisive choices to be made over a longer period, while external growth involves a sudden change in size.

External growth involves the acquisition of already existing and functioning companies. The advantages of external growth are the greater speed of implementation, the lower cost of acquiring a functioning structure rather than creating one from scratch, the greater possibility of obtaining financing and the possibility of developing synergies. However, when assessing the attractiveness of the acquisition strategy, it must be taken into account that not all resources and assets of the acquired company may be instrumental to achieve the strategic advantage of the acquirer.

⁸Ross, et al., 1996

⁹Ross, et al., 1996

The internal choice, on the other hand, gives rise to a multiplicity of alternatives, each of which incorporates specific operational solutions, makes available several feasible options and consequently the choice process is not constrained by the scarcity or uniqueness of possible solutions, as often happens with external growth. There may be other elements to be taken into account, the first of which is certainly important and should not be underestimated, and relates to the degree of risk, since we are talking about strategic choices with a completely different degree of risk. The other issue is the reversibility of the choice, where the internal alternative is certainly characterized by greater flexibility as it can be reversible and entails supportable exit costs; on the contrary, the external alternative implies the launch of an irreversible initiative, at least in the short term, with exit costs that are sometimes so high as to discourage the decision.

Of course, in order to avoid make-or-buy decisions being taken without having the possibility of identifying and weighing up the elements that could subsequently condition the outcome, it is necessary to analyze in detail the factors that guide the choice. As a first step, it is interesting to assess the company's financial, technological and organizational aspects.

On the financial front, it is noted that the advantage of the internal choice concerns the fact that one has the possibility of using only the resources necessary to carry out the project, which is why it is considered the most flexible choice. On the contrary, in the external choice, the management cannot intervene, or at least can do so in a very limited way, in the decision of the financial outlay. Moreover, it may happen that the operation involves the acquisition of non-functional assets or instrumental goods of little interest to the purchaser but which cannot be ignored; this limitation also influences the price, leaving in many cases modest margins on the financial negotiation front. This alternative is certainly the most rigid, and from a financial point of view, internal investment is therefore preferred.

On the technological front, too, the internal choice brings advantages of greater flexibility, because it allows management to choose the level of technology that is most functional to the initiative to be implemented. From the point of view of external growth, it is not possible to achieve the same advantages, since acquirers could find in the situation whose target's technology is not suited to the buyer's needs.

On the organizational side, however, the important aspect to consider is the layout, which sometimes plays a decisive role. In the case of internal investment, the problems of integrating the investment with the pre-existing structure are usually easily solved, there are no problems of productive reorganization, which, on the contrary, occurs in the case of external growth.

From a decision-making point of view, the classic internal investment path does not entail any risks that may inhibit the process, whereas in the case of external growth, the decision-making process is complex and delicate, since, at a formal level, acquisition decisions must be approved by the ordinary shareholders' meeting and the timeframe is longer if the bidder is a listed company. It also takes a long time to complete the organizational integration of the companies involved. Companies can also resort to a third option, which is in some ways similar to external growth but not perfectly coincident, it is the so-called 'contractual growth', defined as a strategic alliance. It is often the case that companies feel competitively weak and need to reduce the strategic

gap between themselves and their main competitors. In order to meet this need, the external choice is usually favored as it offers management multiple possibilities of implementation, such as acquisitions, mergers, minority investment or joint ventures; whereas the internal choice lacks internal resources and competencies to make a 'quantum leap'.

Many companies tend to operate in a bidirectional way, i.e. they combine acquisitions with internal investment operations ¹⁰.

2.5.1 Why Considering Inorganic Growth?

The reasons to engage in M&A have long been the subject of research in the literature. Such transactions can help bidding companies to gain market positions with a speed that mere internal development could not allow. Among the various research proposed, it is useful to list the possible reasons for a company to engage in an acquisition transaction:

- obtaining technological, managerial and commercial skills;
- the consolidation of the competitive position;
- diversification of business areas;
- internationalization.

Evaluating only the positive effects deriving from the choice of internal investment, we will never, or only in limited cases, consider the external choice, which seems to be the least convenient. Therefore, the success of M&A operations may appear contradictory, which is why the determinants of success are better explained below.

A first explanation may concern the effects produced by external growth, which seem to be more convincing than the negative factors seen before. This means that the advantages outweigh the disadvantages. There is no doubt that the size of the potential benefits of external growth is very significant, which is why it makes it particularly interesting and attractive, despite the high-risk exposure.

Through external growth, the acquiring company can strengthen its market position to enhance or complement its distinctive capabilities. It can also expand its business by improving and complementing its product or service offering, and it can enter new markets.

Among the advantages of external growth, the ones that are most attractive are: the objectives that can be achieved quickly, the overcoming of barriers to entry, the possibility of acquiring scarce skills (such as technological know-how), the reduction of the time needed to access market factors (market shares, products, or distribution channels), the possibility of investing in companies operating in very innovative sectors and thus seizing the opportunities that arise in certain sectors.

To exploit these advantages, it is important to clarify the strategic actions that the company intends to carry out. It has been verified that companies operating in more attractive and innovative sectors tend to make related acquisitions, which is the case of the gaming industry under analysis.

Once the motivations of a strategic-competitive nature have been considered, other positive effects that can be assessed at corporate governance and personal level can be added. Influential are in fact the effects on the image of the bidder company, as well as the elements that affect the psychology of the decision-maker. In fact, the operators can be influenced by the awareness that the acquisition operation allows the achievement of a notoriety and the consequent possibility of accessing centers of power otherwise unreachable (the so-called social visibility); and the affirmation of prestige and personal ego by the top management. The separation between management and ownership in today's companies makes it difficult in some cases to verify that management always acts in the public interests of the shareholders and not for personal interests, this phenomenon is called "moral hazard¹¹".

An important theory developed by Jensen and Meckling in 1976 regarding this topic and included in the reasons for carrying out an inorganic growth operation through M&A is called Agency Theory. The main assumption of agency theory is that principals and agents are all rational and wealth-seeking individuals who are trying to maximize their own utility functions. In the context of corporate governance, the principal is the shareholder, and the agent is the management. Through a takeover such a misalignment of interests can indeed be avoided, since the new organizational chart that will be created will always tend to maximize the commitment of the management and thus the market value of a company according to the interests of the management ¹².

2.6 Organic vs Inorganic Growth

In addition to the above-mentioned theories in the understanding of the motivations of firms to engage in M&As, the many studies in this field identify additional determinants of external growth. The execution of a diversification strategy through mergers and acquisitions is pursued with the primary aim of creating synergies. The term synergy, derived from the Greek $\sigma u v \epsilon \rho \gamma \delta \varsigma$, meaning "working together", was defined by "Il Sole 24 Ore" as follows: "The reaction of two or more agents working together to produce a result that cannot be achieved individually [...] The economic logic behind an M&A transaction is that the value of the business combination is greater than the value of the two companies considered independently."

The theory of value creation states that a company's chances of success are closely linked to its ability to increase wealth and gain a sustainable competitive advantage over time.

An acquisition creates value when the value added by the M&A transaction is greater than the control premium paid by the acquiring company, to formalize this idea it is useful to introduce the concept of Net Value Added ("Net Value Added").

NVA = total value received - total price paid

The value received from the acquisition is considered to be equal to the sum of the intrinsic value of the target (considered as a stand-alone entity and led by the original management) and the present value (i.e. discounted in time) of any improvement in performance (operational, financial etc.) obtained through the M&A. The second component of the above formula, the price paid, is equal to the market value of the target, plus any premium required to persuade the target's shareholders to sell their shares. So the above formula can be also written as:

¹¹A condition in which a party, exempt from the possible negative economic consequences of a risk, behaves differently from the way it would behave if it had to suffer them (Treccani, 2012)

¹²Jensen and Ruback, 1983

Value created for the buyer = (*Stand-alone value of the target* + *Value of improvements in operating performance*) - (*Market value of the target* + *Premium for purchase*)

If the difference between the total value received by the acquirer, the intrinsic value of the divested business plus the value resulting from the integration, and the total value paid by the acquirer is positive, it means that the net value added is positive, therefore, the acquisition transaction has created value for the acquiring company.

Efficiency theory helps to give an accurate definition to the concept of synergy, attributing it a threefold nature:

- Financial synergies: they mainly result in a lower cost of capital and an increase in cash flows. Diversification into unrelated businesses, as in the case of conglomerate acquisitions, makes it possible to offset any negative cash flows from loss-making businesses with positive cash flows from other businesses. This gives the firm greater economic and financial stability and allows it to benefit from a higher debt capacity and a lower cost of debt, as a result of the fact that the market perceives a lower specific risk. Financial synergies are also the result of the creation of an internal capital market from which the company can choose to raise resources when recourse to the external market is too costly. In addition, by avoiding the costs of information asymmetry typical of external markets and having access to reliable internal information, the organization has the opportunity to allocate its economic resources in a better way: liquidity from businesses with low growth opportunities can be transferred to other activities of the enterprise with better investment opportunities.
- Operational synergies: these may result from an improvement in income following an increase in revenues or a reduction in costs. Post-merger pricing power and higher purchasing power contribute to the increase in revenues if the two companies operate in the same industry. Obviously, these achievements will be conditioned by the degree of competition in the market and the size of the company after the merger or acquisition. A positive impact on revenues is also likely to come from the fact that the combination of two or more companies can be a way, for each entity involved, to pool its relevant skills and resources. It is an operation that allows each entity involved to offer potentialities that the others do not have and, at the same time, to enjoy the capacities possessed by the partners, which they would not have been able to use before. To complete the analysis, as previously mentioned, there are the synergies that have an impact on cost reduction: they take the form of an improvement in income resulting from the combination of previously separate operations and arise, mainly, from the increase in size and the sharing of resources, processes and competences between several businesses of a company. The increase in size following the M&A transaction allows, among other things, the achievement of a cost reduction resulting from a more intense and efficient use of the assets in possession and from the exploitation of economies of scale, consisting in the decrease of the average unit cost as the production volume increases. These economies are the result of a distribution of fixed costs over a higher quantity of output and are primarily due to M&A operations involving companies belonging to the same sector, i.e. horizontal M&A operations.

For example, in a company of our reference market, the gaming market, the merger could allow a more efficient use of the expensive resources linked to innovation or the achievement, with the same technology, of a wider customer base, to make the high costs associated to it more easily recoverable. A decisive role in diversification through mergers and acquisitions is played by the possibility of exploiting economies of scope. These economies of scope are realized through the positive effects, in terms of cost reduction, resulting from the diversification of a company's product range, which allows an increase in sales and the simultaneous exploitation of existing resources, skills and processes. The acquisition of a company offering related products allows the acquirer both to expand its product range by reaching new customer groups (with a consequent increase in turnover) and to save costs by using existing production processes, distribution systems and skills, which do not need to be set up from scratch. Even when there is no overlap between the value chains of the various businesses, thus also in the case of conglomerate-type M&A, it is possible that there is a sharing of knowledge and skills among them: "the competitive advantage generated by intangible interdependencies occurs through the transfer of generic capabilities from one business unit to another, i.e. know-how related to the management of a particular type of activity." ¹³. Acquisitions, which enrich the acquiring firm with new knowledge, can improve its competitive position by creating value: the know-how resulting from the acquisition can boost the innovation of a firm when it acquires another with complementary technologies.

• Managerial synergies: these are a direct consequence of the previously analysed Agency Theory, and can be defined as synergies arising from the sharing of organisational, planning and monitoring skills necessary to address strategic and operational issues and to achieve higher performance. In the face of disagreements between shareholders and managers, exploiting these synergies may allow a review of the management bodies and their eventual recompositing. To give an example, managerial synergies may arise from the acquisition, by a company with a very competent management team, of an organization that does not have this strength.

Alongside the efficiency theory described above, the monopoly theory finds market power to be the rationale for mergers and acquisitions. According to this theory, takeovers provide firms with the opportunity to reduce the intensity of competition within the industry and increase their market power. Mergers between competing firms inevitably reduce the number of players in the industry and increase the market share of the acquiring firm, which improves its competitive position: the increase in competitiveness after a merger and acquisition will allow it to increase its margins and operating flows due to its greater bargaining power with customers and suppliers. Although the increase in market power is mostly related to horizontal acquisitions, this motivation can also be found behind conglomerate mergers: the acquisition of firms belonging to different sectors makes it possible to sustain a policy of predatory pricing, aimed at gaining market shares in one business, by exploiting profits from another business sector.

¹³Fontana, 2015

The motivations behind mergers and acquisitions have also been found in the empire-building theory, according to which such initiatives are pursued with the intention of satisfying the personal interests of managers, who through such actions maximize their own utility at the expense of shareholders. From this perspective, therefore, acquisitions are carried out by managers with the aim of building large "empires", financed by shareholders, and capable of giving them power, not only within the company but also externally towards political institutions and civil society ¹⁴.

It is possible, therefore, that an M&A operation is carried out by a company despite the fact that there are no real opportunities for wealth creation, perhaps by acquiring companies that are undoubtedly profitable, just because its managers do not want to give up the prestige and visibility that an operation such as external growth through acquisition or merger is able to confer them.

Barriers to entry should also be taken into account: companies operating in sectors protected by high barriers to entry resort to external growth to strengthen market positions by acquiring existing competitors, defending the status quo and taking over companies in difficulty or known to be for sale.

As stated above, the ultimate goal for a company conducting an acquisition is to create value for the new entity. The decision to grow inorganically is one of the most important management decisions and to create value for shareholders. However, an M&A transaction can have three possible outcomes, measured from the perspective of the acquirer: value preservation, value creation and value destruction. A key element that can lead to the success or failure of a transaction is undoubtedly the dynamic capabilities of management. A dynamic capabilities framework emphasizes how a successful firm can "integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" ¹⁵. Teece also argues that dynamic capabilities can enable the firms to create and capture value by designing appropriate business models, but what capabilities are needed in the reinvention of business models in the M&A process?

- 1. Sensing and Shaping: Helping to select new key assets and new customer segments, thus contributing to a buyer to shape emerging market demand and new technology needs.
- 2. Identifying and Capturing: supporting an acquirer's business to obtain new resources and key idiosyncratic capabilities and to extend the networks of a partnership.
- 3. Transform and reconfigure: supporting an acquirer's business to transform the way customers are retained and the sales force and thus, to deliver value to the customer and capture value for stakeholders.

As a result of these transformation processes, the buyer's business results in a new cost structure, a new revenue stream and a new customer value proposition and can sustain a new competitive advantage.

Such capabilities therefore become vital during an acquisition, as they allow the acquiring company to maximize the value of possible synergies and broaden its product or service offering by actively modifying

¹⁴Zona, 2012

¹⁵Teece et al., 1997

its business model and expanding the degree of complementarity. "Studies give clear empirical evidence that complementarities are a significant factor in the success of M&As" (Bauer and Matzler, 2014), they have been studied in terms of top management team complementarities, technological complementarities, strategic and market complementarities or product complementarities. Due to the interplay of complementary characteristics, value creation occurs not only through cost reduction but also through revenue and market share growth through dynamic opportunities (Kleinbaum and Stuart 2014).

2.7 Valuation of sinergies

In a deal, could be a merger or an acquisition, it is of fundamental importance to give a value as accurate and precise as possible to the value of the target (value we will denote with WT). It often happens that following the announcement of the deal, the market capitalization of the target (if it is listed on the stock exchange) rises sharply. We will define with ΔWT) the difference in the wealth of shareholders of the target firm and with (ΔWA) the change in the wealth of shareholders of the acquiring firm (Bradley et al., 1988). So, according to Bradley, the total synergistic gain can be calculated as:

$$\Delta \Pi = \Delta WT + \Delta WA$$

Where $\Delta \Pi$ represents the premium to be paid for the target company. Because of this equation, "companies must strive to achieve synergies higher than the premium paid or at least achieve positive synergies" (Sirower, 1997).

Once the above logic has been established, the question remains as to the final derivation of the price of a company, and whether this can be significantly different from its intrinsic value. It is worth remembering that there is no precise and absolute value for a company, as subjectivity is implicit in the work of the analyst-valuer, as demonstrated by the fact that several experts, although in possession of the same information and using the same criteria of valuation, in valuing the same company can arrive at results that are also significantly different. So what determines the value of a company? Theoretically, we can determine the value of a company by discounting to the present the income flows that it will be able to generate in the future (income and financial flows). The value of a company must therefore be interpreted in prospective terms, weighting the valuation on the basis of the degree of uncertainty and unpredictability inherent in the estimate of future cash flows.

The main valuation methods and models include the following: the equity method, the income model, the mixed equity-income model, the financial model, the market multiples model and finally the real options model. We will briefly analyze the fourth and fifth of these models, which are probably the ones most commonly used in practice.

• FINANCIAL METHOD

Better known as DCF (discounted cash flow), this method leads to the determination of the value of the business based on the following inputs:

- 1. Operating cash flows (free cash flow gross of financial interests) that the economic activity will be able to generate within the time horizon of the business plan (usually 3-5 years);
- 2. Residual value (terminal value), i.e. the value of the business at the end of the time horizon considered, obtained by extrapolating the results expected beyond that period.

The value thus estimated will correspond to the market value of the net assets of the company considered (enterprise value). To obtain the total market value of the shares (or quotas), the net financial position, given by the difference between the number of financial debts and liquid financial assets, must be deducted from the enterprise value.

$$Equity Value = Enterprise Value - NFP$$

In the evaluation, as well as in the forecasting, of cash flows, there are assumptions involved such as the growth rate of short and long term profits, the discount rate to be applied, the time window used and whatever else contributes to the final result. This method allows forecasting and assuming different scenarios on the future of a company, as it is sufficient to change the key assumptions of the model to assume both revenues synergies and costs synergies. The advantages of having a precise assessment and valuation of synergies enables the company to come as close as possible to the target's stand-alone value and hence capture most value ¹⁶.

• MULTIPLES APPROACHES

This is a so-called "relative" valuation method, often used to check the robustness of the main valuation techniques based on "absolute" values. Within the broad category of multiples, we can distinguish between equity-side multiples (based on equity value) and asset-side multiples (based on enterprise value). It should also be noted that in the calculation of multiples the choice can fall on so-called current multiples, calculated on the basis of the data available in the last issued financial statements, leading multiples, calculated on the basis of budget estimates for the following year, trailing multiples, obtained by looking at the budget results of the previous twelve months.

The multiples briefly listed above are more generally classified as trading multiples, i.e. multiples directly extrapolated from the balance sheet data of publicly traded companies. For the purposes of our work, the so-called transaction multiples (or deal multiples) are of greater interest: they are multiples derived

¹⁶Kode et al, 2003

directly from the analysis of M&A transactions. Below we briefly list the various steps in a valuation process based on previous transactions:

- Make a list of companies operating in similar industries and/or with similar asset sizes;
- Filter the list down to a range of 5-10 transactions, preferably involving companies with similar sources of earnings, market capitalization, industry and geographic location;
- Decide which multiple to use, the most commonly used being forward or trailing EV/Revenue or EV/Ebitda;
- Calculate the average of the multiples previously calculated and the value of the multiple relative to our company.

The multiple approach applies to the estimation of synergies as similar transactions in a sector give an overview of the possible synergies realized through recent mergers. The objective of the synergies estimation is to provide a bracket of potential synergies for the buyer, especially a reasonable upper limit, as well as an anchor for the synergies valuation with the DCF approach.

Chapter 3

CASE STUDY: Real Options Method to Value Dynamic Capabilities-Based Synergies in a M&A Deal

3.1 Theoretical Background

The real options method, born around the eighties of the previous century by Stewart Myers, has become a subject of great attraction within a few years, given the significant impact and considerable advantages that this method has proved to have in the determination of the economic capital of a company. In particular, during the 1990s, interest in this particular type of valuation technique grew to become one of the most important financial evaluation and strategic analysis tools. In the course of these years, studies conducted on real options and their use in the valuation of a company's economic capital have led to the development and growth of three main analytical approaches:

- the classical approach;
- the Subjective approach;
- the Marketed Asset Disclaimer ("MAD") Approach.

Each of these three approaches differs from the others on the basis of three fundamental elements:

- 1. the applicability, i.e. the indication of what the determined real option value actually represents and at what point in time it is most appropriate to use that value;
- 2. the principles, i.e. the indication of the theoretical elements underlying each approach, in order to test its validity;
- 3. the practical mechanisms, i.e. the technical steps that characterize each approach, the advantages and disadvantages of each different method and the difficulties encountered in implementing them.

Before explaining the concept of real option, it is appropriate to do an overview on the broadest category of derivatives and financial options.

3.1.1 Financial Option

A derivative is a financial instrument whose value depends on that of an underlying asset, which may be of a different nature: a share, a bond, an interest rate, a currency, or a commodity. The definition of derivative securities is implicit in these instruments since they "derive" their value from the value of other financial instruments.

It can therefore stated that the value of a derivative is a function of the value of another security, called the underlying ¹. Derivatives can be classified into the following categories: forward contracts, futures, swaps, options.

Options, unlike other derivatives, do not oblige the parties to buy or sell the underlying asset, but give the buyer of the contract the right to receive or deliver the traded asset or its equivalent.

The seller of the option contract, unlike the buyer, is obliged to deliver or receive the asset subject to the option contract. The contract which gives the buyer the right to decide whether to buy the underlying asset at the strike price is called a call option, while the contract which gives the buyer the right to decide whether to sell the underlying asset at the set price is called a put option. In return for purchasing the right to buy/sell, the buyer of the option is required to pay the seller a price called the option premium.

¹John C. Hull - Options, Futures, and Other Derivatives, Pearson (2017)

A call option gives the holder the right (and not the obligation) to buy an underlying asset by a certain date (expiration date) at a fixed price, called the strike price.



Figure 3.1: Payoff of a Call Option

As shown in the graph above, for all values of the underlying asset S(t) lower than strike price X, the payoff offered by the purchase of a call option is negative (the call is said to be "out of the money") by an amount equal to the premium paid for the purchase of the call. In fact, if S(t) < X, it will not be profitable to exercise the call since the purchase of the underlying asset can be made directly on the market at a price lower than that offered by the call.

For values of the underlying asset above the strike (S>X), the payoff of the call becomes positive and increases as the strike price rises. For values of the underlying asset above the strike (S>X), the call payoff becomes positive and increases as the price of the underlying asset rises.

A put option gives the holder the right to sell the underlying asset, by a certain date, at a predetermined price.



Figure 3.2: Payoff of a Put Option

For all values of the underlying price S(t) below the strike price X, the payoff offered by the purchase of a put option is positive (the put is in the money) and decreases the more the value of the underlying converges to the strike price. For values of the underlying asset above the strike price, the payoff of the put option becomes negative by an amount equal to the premium paid for the purchase of the put.

If S > X, it will not be profitable to exercise the put since the underlying asset can be sold directly on the market at a higher price than that agreed for the put.

If the option can only be exercised at the expiration date, it is called a European option, whereas if it can be exercised at any time prior to the expiration date, it is called an American option. The option is said to be "in the money" if the cash flow implied by its possible exercise is positive for the holder. It is called "out of the money" if the cash flow implied in its eventual exemption is negative. It is called "at the money" if this flow is zero.

If financial markets were efficient and complete, there would be no need to use derivative contracts, since the payoff offered by these instruments would be easily replicable through the instruments normally traded in the financial markets. The existence of market frictions prevents or makes it too costly to replicate the payoff provided by the derivative.

It is possible, therefore, to affirm that the first function performed by derivative instruments is that of completing the market, that is, offering investors payoffs that cannot be obtained with other instruments, while the second function that characterizes derivatives is that they exploit the asymmetry of the payoff, allowing the transfer of the risk from those who refuse it (buyer of the right to exercise the option) to those who are willing to take it on (seller of the option, who assumes the obligation to do what the counterparty requires).

3.1.2 Intrinsic and Time Value

The option price can be divided into two parts: intrinsic value and extrinsic value or time value. The intrinsic value is defined as the maximum between zero and the value that the option would have if exercised at the time. In formula:

Call Option max(0, S(t)-X)

Put Option max(0, X-S(t))

The extrinsic value or time value is the difference between the price of the option and its intrinsic value (we will denote by c the price of a call and by p the price of a put).

Call Option c-max(0,S(t)-X)

Put Option p-max(0,X-S(t))

The extrinsic or temporal value captures the "added value" represented by the time remaining until the expiration of the contract. At any time before that the contract expires, for example in the case of a call, there is always the possibility that, by postponing the exercise, the value of S(t) and consequently that of the call will increase. Precisely because of this, it is correct to interpret the value S(t)-X as the lower limit of the value that the call can assume at any one time. At the expiration of the call, the extrinsic or time value is zero and the option is worth its intrinsic value. Before expiration, the value of the call is given by the intrinsic value (greater than or equal to zero) and the time value. Before expiration, the value of the put is given by the intrinsic value (greater than or equal to zero) and the time value. Before expiration, the value of the put is given by the intrinsic value (greater than or equal to zero) and the time value (it can be negative; this can be interpreted as the cost of having to wait until expiration to exercise the option).

3.1.3 Real Option

A real option is a discretionary investment opportunity. It exists when the holder has the right, but not the obligation, to make an investment, or to change its characteristics in the course of execution. This element has led real options to be compared to financial options, since the latter also offer the holder the possibility, but not

the obligation, to purchase a certain asset at a predetermined price and date.

The logical path leading to the identification of real options consists mainly of the following steps. Firstly, management needs to make a series of assessments, starting from the project structure and its characteristics. In this phase of analysis, it is important to involve all those who, in different capacities, take part, even if indirectly, in the process of making strategic decisions. Secondly, the different points of view are gathered in order to identify all the areas in which the management, considered as a whole, is estimated to have levers of governance or adaptability to the occurrence of certain scenarios. At this stage of analysis, a distinction must be made between executive projects, which aim to finalize planned decisions, and strategic projects, which have a strong innovative content and a significant potential impact on the company's competitive position. These projects, by creating new opportunities for the future, most likely incorporate real options. This step leads to the identification of the real options themselves and their parameters. Thirdly, the real options arising from each of the potential areas of managerial adaptability described in the previous step are verified and formalized. In general, it can be stated that an area of managerial adaptability generates a real option when it is possible to formalize the characteristic parameters of the option itself, i.e. the value of the underlying asset, the exercise price, the maturity and the volatility. It is a question of defining, at the level of logical relations, in which situations the exercise of the option is convenient. The last phase of the strategic analysis concerns the verification of the sequence of exercise conditions. Real options are often presented as "compound options"; in other words, a single project may give rise to several real options at the same time, which must be recomposed within a single scheme. This is one of the main problems with composite real options. If two or more real options arise from the same project, they have a joint value (premium for the compound option), which may be different from the algebraic sum of the values of the options considered individually. In order to recompose the analysis within a unitary scheme, it is necessary to resolve the links of interaction between options, i.e. of mutual influence. It should be noted, however, that from a study by Trigeorgis, the marginal value of each real option, in the presence of others, is generally lower than the value it would have as a single option on the project and this value decreases as the number of options present increases. In other words, if n options arise from a project, the n+1 option, all else being equal, will be of lower value than the n option. A fundamental difference to be considered with regard to the differences between options on real assets and financial options concerns the duplicability of the latter, i.e. the possibility of replicating a financial option by building an equivalent portfolio, a possibility which is excluded when talking about an investment in real assets which generates options from time to time. This is not the case with an investment in real assets that generates options that are specific to a given structural and competitive context. To construct the equivalent portfolio, reference is made to a market of negotiable securities. The non-negotiability of what will be taken as the underlying of an option represents a limitation of this method of no small magnitude, especially with regard to those parameters which in other valuation methods are deduced from the market; reference is made in particular to volatility (σ).

3.1.4 Factors influencing the price of options

The main factors influencing the price of options can be briefly summarised as follows:

- the current share price and the strike price: the final value of a call that is exercised is equal to the difference between the share price and the strike price. Therefore, calls are worth more as the share price increases and less as the strike price decreases. The final value of a put that is exercised is equal to the difference between the strike price and the share price. Therefore, puts behave in the opposite way to calls, being worth less as the share price rises and worth more as the strike price falls;
- residual life and option price: the value of American options increases as the residual life increases because the exercise possibilities given to the option holder increase. Conversely, European options are not necessarily worth more as the remaining life increases;
- volatility and option price: by defining the volatility of the price of a security as a measure of the uncertainty about future movements in its price, it can be inferred that as volatility increases, the probability that the security will perform well or poorly, which benefits the option holder, increases. As volatility increases, the value of calls and puts increase;
- risk free and option price: as interest rates increase, the rate of growth of the share price tends to increase, while the present value of any future cash flow expected from the option decreases. Both of these effects tend to decrease the value of a put, while in the case of calls, the first effect tends to increase the option price while the second tends to decrease it. It is shown that the first effect always dominates the second: the price of a call always increases as the risk-free rate increases;
- dividends and option price: dividends decrease the value of the stock, therefore they increase the value of puts and decrease the value of calls.

3.1.5 Considerations about Real Option Method

The real options model, in the context of Capital Budgeting, makes a fundamental additional contribution to investment decisions taken with discounted cash flow methods, as it allows flexibility to be taken into account, an element necessary to face in situations of uncertainty, but which cannot be captured by traditional methods. In fact, if we consider any investment, we realise that, with the passing of time and the acquisition of new information, the uncertainty about the entity of future cash flows and market conditions is reduced, so that the management can intervene with a different degree of flexibility on existing projects, in order to modify or revise the operating strategy initially formulated.

The possibility for management to intervene dynamically and flexibly on ongoing projects introduces an asymmetry in the probability distribution of the net present value, which expands the value of the investment, improving its earning potential and limiting losses compared to the hypothesis in which the same project was

managed by a totally inactive management. Flexible management will be able to reap the benefits of a positive evolution of the scenario and reduce the negative consequences of an unfavorable evolution of the variables affecting the value of the project. The real options approach thus makes it possible to perceive and measure the managerial flexibility needed to capture the benefits and limit the damage associated with these uncertain scenarios.

This approach allows for the correct assessment of investments in flexibility and this is the added value brought by real options, which is all the greater the more companies operate in highly uncertain contexts. In contrast, DCF fails to capture the value that comes from managerial dynamism and the ability to exercise strategic development options at the optimal time. It estimates the cash flows expected from the project by determining ex ante and irreversibly the nature and sequence of future decisions, taking into account only one possible expected outcome, the one considered as the most probable.

Among other things, the DCF approach does not take into account contingent decisions and does not fully assess the possibilities of intervention of the management, resulting, as mentioned above, as not very dynamic and lacking the ability to adequately represent the strategic analysis.

Therefore, the manager becomes a simple operational executor of a strategic plan formulated at the time of the evaluation. If, for example, a firm decides to postpone an investment until it has acquired more information about the market, the DCF approach would value that investment at zero, whereas it could take on a positive value with the Real Options approach.

Moreover, the DCF assumes a risk-adjusted premium, which is assumed to be constant throughout the reference period, without considering that in reality the risk profile of the project evolves over time, in relation to the changing status of the project itself.

This does not mean that the Discounted Cash Flow approach is useless for a correct evaluation of investment decisions or for the assessment of the overall value of a company, but its use requires particular caution when the circumstances are such as to imply a low representativeness of reality or, in any case, a partiality of the results identified.

A further circumstance in which the real options approach may be useful is when the uncertainty is so great that it makes sense to wait for more information, avoiding making irreversible investments that one may later regret. Irreversible investments generally require thorough prior analysis because, once made, the resources cannot be disposed of without losing much of their value.

Irreversible investments are often managed by postponing the execution of a project until the uncertainty is largely resolved or by splitting the investment into several phases. The value of an irreversible investment, with its options, is greater than using traditional instruments, because options eliminate losses, as they allow the possibility of stopping a project if obstacles to its implementation arise. At this point, it is clear that managers who use real options to assess their choices will therefore make more irreversible investments, but in smaller steps, and after waiting for uncertainty to resolve itself.

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Real options may also be used in other situations:

- in order to identify when there is a contingent investment decision;
- when it appears that value is captured by possible future growth options rather than by the current cash flow;
- when project updates and strategy adjustments may occur during the realization of a strategic objective.

From what has been argued so far, it is possible to identify the main benefits of using real options, which are valid in the context of capital budgeting, but perfectly extensible to a more general discourse on company valuation. As well as offering the possibility of taking uncertainty into account, they allow the strategic dimension of the project to be made explicit, highlighting the interaction links that can be generated between today's decisions and the opportunities of the future.

A major strength of the real options approach is that it allows a more objective estimation of the risk inherent in the businesses considered and of other quantities that enter the valuation of the options themselves: in the selection of these inputs, in fact, financial markets represent an important reference point. For example, the relevant risk is expressed by the volatility of the returns of the underlying asset, and this parameter can be obtained from the market; on the other hand, the use of theoretical probability in Net Present Value applications, which take into account several possible alternative future scenarios, is very much affected by the subjective estimates of the management.

The real options approach allows then to adequately evaluate the Intangible Assets of the company under examination: intangible assets have a significant weight in the measurement of the value of companies operating today on the market and most of the valuation problems of the traditional models relate to the valuation of intangible assets as well as uncertainty about the future ². Despite of these informational advantages of the approach, some literature raises doubts and questions about its actual use, which in part limit a push for its wider use.

First of all, it should be pointed out that a first critical issue is the complexity of the mathematical models underlying the approach. While it is true that some of these models are difficult to use in the transition from financial to real options pricing, it is possible to identify some models, such as the binomial tree model, which can be usefully employed, with the proper adjustments.

In any case, however, the necessary application of these pricing models should not lead to a stubborn attempt to understand all the underlying mathematical relationships, but rather should lead to an understanding of the basic principles governing the relationships between the variables employed.

A second criticism of the real options approach has been raised regarding the difficulty of estimating the volatility of the underlying option, which is a very important parameter in option pricing models. While it is true that real options have as their object assets that are not fully comparable to the underlying of financial options, since they

²Amram M., Kulatilaka N., Real Options, Etas, Milano, 2000.

are not traded on markets from which one can derive the trend of their prices and therefore their variability, it is possible to solve this application problem by looking at the volatility of similar projects, or by deriving volatility from the cash flow forecasts expected from the projects under consideration.

A third critical point concerns the application of financial option pricing models to the real options approach. A number of theoretical issues need to be resolved.

The first issue arises from the consideration that assets subject to real options do not often enjoy the tradability feature that characterizes financial assets, on the basis of which non-arbitrage assumptions can be adopted. A second issue concerns the compound nature of the option. Classical option pricing models are designed to value single options. On the other hand, an investment project very often generates more than one real option, the valuation of which cannot disregard the interaction links existing between the different areas of managerial adaptability. This problem is countered by strategic considerations concerning the correct sequence in which the conditions for exercising the various real options arising from the same project must be verified.

The third problem concerns the assessment of real options on projects that generate cash flows within the reference time horizon. This issue finds a clear parallel in the field of financial options, where the underlying asset pays dividends. Therefore, the same solutions can be adopted for real options as for financial options.

3.2 Methodological Approach

3.2.1 Characteristic elements of Real Option model

The first factor to be considered in the real options valuation approach is the current value of the underlying asset, ("S(t)"). This is the present value of the cash flows expected from the investment opportunity on which the option is based. Since this value cannot be directly identified on the market, as it is not an actual financial asset, it is necessary to size the securities used to replicate the underlying asset.

The second factor concerns the volatility of the underlying asset (" σ "). This represents the riskiness of the project assets, i.e. the unpredictability of the growth rate of the cash flows associated with the investment. Since this element also cannot be observed in the financial markets, historical data series are generally used for its calculation. If these time series are not available or if they are insignificant, alternative methods can be used with the necessary precondition that option contracts on these underlying assets can be found on the market ³. However, the typical principle of financial options, according to which an increase in the volatility of the underlying asset increases the value of the option itself, must also be applied to the model of real options, on the assumption that, as the riskiness of a project increases, the opportunities for high returns that it offers, but also the associated probability of failure, increase. Given, however, that management has the flexibility to expand the project if conditions evolve positively while it can always abandon it if conditions evolve negatively, the overall value of the option encompassing this project will tend to increase ⁴.

³Damodaran A.: The promise and Peril of Real Options, Stern School of Business, 1996

⁴Michael M.P., The Real power of Real Options, 2000

The third element to consider is dividends ("D"). They refer to the value lost over the life of the project, represented, for example, by the costs incurred to preserve the option from competitors. The valuation of companies in the start-up phase tends to make it difficult for them to distribute dividends, so this factor is generally assigned a value of zero. This eliminates a very complex element, such as dividends, which would make the real options model even more complicated.

The fourth principle is the strike price ("K"). This element tends to coincide with the costs incurred in acquiring the assets necessary to carry out the project.

The fifth factor is represented by the life to maturity ("T - t"). It corresponds to the period for which the investment opportunity is valid. The life to maturity can be influenced by technologies, the life cycle of a product, the competitive advantages of the investing company or the duration of contracts. This factor coincides with the time it takes to achieve a leadership position in the businesses in which the company in question has chosen to operate. From the moment when the leadership position is reached, in fact, the option is cancelled and it is possible to go back to applying the DCF, as a method of evaluating the economic capital of the company.

The sixth element is the Risk-free rate ("Rf"). It coincides with the return that the company offers to those who finance the project, and therefore with the way in which the project is hedged. The reference time horizon for Rf should be consistent with the life to maturity of the real option whose price is to be determined.

In addition to the elements examined so far, which are necessary for the application of the real options approach, there are several factors which, on the contrary, are not necessary for the application of the model but which are necessary in the valuation of the economic capital of the company according to the traditional models. This gives the real options approach an important advantage over traditional valuation models in eliminating the need for factors that require subjective estimates, which tend to be difficult, risky and uncertain.

First, the real options model does not require knowing the probability estimates of possible future price changes, as these are captured by the current value of the underlying asset and the estimated volatility. In addition, there is no need to know the expected rate of return on the underlying asset, because the trade-off between risk and return is already identified by the value of the underlying asset and an appropriately created equivalent portfolio; it will be sufficient to know only the value of the rate of return for risk-free assets with a duration coinciding with that of the option.

There is no need to determine the rate of return of the option either: the option is valued through the dynamic path of the underlying asset. Finally, the conditioning of the discount rate with respect to risk, which is typical of the DCF, is not necessary as the valuation solution is independent of individual risk preferences: option pricing solutions are, in fact, embedded in risk-neutral frameworks.

3.2.2 Option pricing methods

This section will briefly summaries some of the best-known pricing models in the real options arena. The main purpose of the analysis is to identify and analyze the uncertain variables on the evolution of which the decisions concerning a certain project within the company depend.

In the real options approach, the asset identified as the underlying may coincide with the increase in a market value, the synergistic value or other assets that represent the result of exercising the option. Critical variables are therefore often identified in the evolution of turnover, the rate structure and the cost of raw materials. The problem at this stage of the analysis is therefore to identify and predict the value assumed by the uncertainty factors that characterize an investment decision.

The first step is to use a reference model to interpret and analyze the diffusive path of an uncertain variable, using stochastic models. The movement of a variable whose value evolves over time under conditions of uncertainty is called a stochastic process. If measured with respect to time, a distinction is made between continuous and discrete stochastic processes. In the former, the variable can change value at any time, while in the latter, value variations occur only at certain specified times. Within the framework of discrete methods, a very popular technique for evaluating real options involves the construction of a so-called binomial tree.

It is a diagram representing the different paths that could be followed by the price of the underlying asset during the life of the option. The binomial model is based on the fundamental assumption that the price of the underlying asset evolves according to a stationary multiplicative binomial process.

Let's consider an underlying asset priced S at time 0 and an option whose price is f. Suppose that the option expires at time T and that during its life the share price can rise from S to S or fall from S to Sd (for: u>1; d<1). The proportional increase in the price of the underlying asset when there is an upward movement is equal to u-1; the proportional decrease when there is a downward movement is equal to 1-d. Let f(u) be the final value of the option if the price of the underlying asset rises to Su and let f(d) be the final value of the option if the price of the underlying asset falls to Sd.



Figure 3.3: Binomial Tree Diagram

Construct a portfolio with a long position on Δ units of the underlying asset and a short position on an option. Calculate the value of Δ which makes the portfolio risk-free. If there is an upward movement in the price of the underlying asset, the value of the portfolio at the end of the option's life will be:

$$S_u\Delta - f_u$$

If there is a downward movement, the value will be:

$$S_d \Delta - f_d$$

To find the value Δ that makes the portfolio risk-free, we impose equality:

$$S_u\Delta - f_u = S_d\Delta - f_d$$

And so Δ will be:

$$\Delta = \frac{f_u - f_d}{S_u - S_d}$$

In this case the portfolio is risk-free and, provided arbitrage is not possible, will yield exactly the risk-free rate. Δ is therefore the ratio between the change in the price of the derivative and the change in the price of the underlying asset that occurs when moving from one node to another at time T. If r is the risk-free rate, the present value of the portfolio is equal to:

$$(S_u\Delta - f_u)e^{-rT}$$

Given that the initial cost of the portfolio is:

 $S\Delta - f$

So:

$$S\Delta - f = (S_u\Delta - f_u)e^{-rT}$$

Finding f:

$$f = S\Delta - (S_u\Delta - f_u)e^{-rT}$$

replacing Δ :

$$f = e^{-rT} [pf_u + (1-p)f_d]$$

Where:

$$p = \frac{e^{-rT} - d}{u - d}$$

These last two equations allow the option to be valued using a one-stage binomial model.

At this point, it is considered appropriate to address the issue of risk-neutral valuation.

It can therefore be said that the variable p represents the probability of a rise in the price of the underlying asset and consequently (1-p) the probability of a fall.

The equation:

$$pf_u + (1-p)f_d]$$

therefore represents the expectation of the final value of the derivative. It can be said that the current value of the option is equal to its expected value at time T discounted at the risk-free rate.

Assuming therefore that p represents a percentage rise in the underlying, the expected value of the price of the underlying E(ST) at time T will be:

$$E(S_T) = pS_u + (1-p)S_d$$

Or:

$$E(S_T) = pS(u-d) + S_d$$

Replacing p:

$$E(S_T) = Se^{rT}$$

The price of the underlying therefore rises, on average, at the risk-free rate. In other words, assuming that the probability of a rise is equal to p is equivalent to assuming that the rate of return of the underlying is equal to the risk-free rate. An important general principle for option valuation, known as "risk-neutral valuation", has just been illustrated. According to this principle, no mistake is made in valuing options if one assumes that the world is risk-neutral. The prices you obtain are correct not only in a risk-neutral world but also in the real world. The p u e d parameters must be such as to determine correct values of the mean and variance of the price of the underlying at the end of the time interval Δt . Given the assumption of risk neutrality, the expected rate of return of the underlying asset is equal to the risk free rate r. Therefore, the expected value of the share price at the end of the interval Δt is equal to $Se^{r\Delta t}$.

It follows that:

$$Se^{r\Delta t} = pS_u + (1-p)S_d$$

So:

$$Se^{r\Delta t} = p_u + (1-p)d$$

The stochastic process assumed for the price of the underlying implies that the variance of its rate of change in a short period of length Δt is $\sigma^2 \Delta t$.

Given that the variance of a variable Q is equal to $E(Q^2) - [E(Q)]^2$, where E denotes the expected value, it follows that:

$$p_u^2 + (1-p)d^2 - [p_u + (1-p)d]^2 = \sigma^{2\Delta t}$$

Substituting:

$$e^{r\Delta t}(u+d) - ud - e^{2r\Delta t} = \sigma^{2\Delta t}$$

The equations found are to be considered as conditions imposed on p, u and d. A third condition set by Cox, Ross and Rubinstein is the following:

$$u = 1/d$$

It can be shown that these conditions imply:

$$p = \frac{a-d}{u-d}$$
$$u = e^{\sigma\sqrt{\Delta t}}$$
$$d = e^{-\sigma\sqrt{\Delta t}}$$

Where:

$$a = e^{r\Delta t}$$

On the other hand, the disadvantages relate to the fact that it is a very expensive method from the point of view of calculation time and cannot easily deal with situations in which there is a possibility of early exercise. In the field of continuous models, the most important approach is the Black/Sholes model.

This model has had an enormous influence on the way traders value options and hedge. It is based on the idea that in efficient markets it is always possible to create a portfolio that exactly replicates option returns in any future scenario.

The derivation of the algorithm is based on the possibility of constructing an equivalent portfolio consisting of a certain number of units of underlying assets and a certain amount of debt in such a way that, for each possible future scenario, the portfolio offers the same return as the option; it follows that the option price must be equal to the current value of the portfolio.

The reason why it is possible to form a risk-free portfolio is that the price of the underlying asset and the price of the option are both influenced by the same source of uncertainty: the change in the price of the underlying asset. In any short interval of time, the price of a call is perfectly correlated, in a positive way, with the price of the underlying asset and the price of a put is perfectly correlated, in a negative way, with the price of the underlying asset.

In both cases, when forming an appropriate portfolio of stocks and options, the profit or loss on the stock position is always offset by the loss or profit on the option position so that the overall value of the portfolio at the end of the short interval is always known with certainty. The option position is in fact equivalent to holding a portfolio consisting of a certain number of units of the underlying asset N(d1) at price S and a certain amount of debt $Ke^{-rt}N(d2)$. The value of the call will therefore be equal to:

$$SN(d_1) - Ke^{-rt}N(d_2)$$

Where:

$$d_1 = \frac{\ln(\frac{S}{K}) + (r\frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$$
$$d_2 = d_1 - \sigma\sqrt{t}$$

N(d1), i.e. the number of shares needed to create the equivalent portfolio, is called the delta of the option. This equivalent portfolio is self-financing and has the same value as the call option at each stage of the option's life; N(d2) is the probability that the option is exercised at maturity.

The value of a European put can be derived using the same procedure with the application of call put parity.

$$C - P = S - Ke^{-rt}$$

C and P are respectively a call and a put with the same maturity and the same strike price.

The derivation of the Black Scholes model is based on the assumption that the price of the underlying asset follows a continuous process, without sudden jumps. If this assumption is not met, as is very often the case with real options, the model will tend to underestimate the value of deep out of the money options. One solution would be to use higher variance estimates to value these options than those used in the valuation of in-the-money options. Another possibility would be to use an option pricing model that allows for jumps in prices, although it is often difficult to estimate inputs for this type of model.

3.3 Case Elaboration

3.3.1 Case Study I: Activision Blizzard Inc. acquires King Digital Entertainment

On 03 November 2015, Activision Blizzard announced the acquisition of King Digital Entertainment ("King.com") for a total amount of \notin 4.53 bn. Activision explained that the acquisition of King Digital will be done through its subsidiary ABS Partners C.V. and that King Digital, which is based in the UK, will continue to operate independently from Activision.

What triggers the acquisition based dynamic capabilities of one of the technology advanced gaming leader such as Activision Blizzard? What similarities and complementarity of dynamic capabilities of Activision and King.com existed and what building blocks of the business model of King could be transferred to Activision's business model?

Bobby Kotick, CEO of Activision, told in an interview for Reuters that the acquisition of King will help Activision expand its business and reach a wider customer base, explaining that 60 per cent of King's users are women and that the company's strength lies in its ability to produce games that don't require consoles or special hardware. Activision will pay USD 18 per King Digital share, 16 per cent more than their current stock market value.

The market reaction over the announcement of the deal was extremely good for the acquirer. The share price of Activision Blizzard increased from \notin 31.39 on 02/November/2015 (the day before the announcement of the deal) to \notin 34.33 on 05/November 2015, representing an increase of 9.4 % in only three days.⁵

King Digital is a Swedish company based in the UK that has been around since 2003 but gained notoriety in 2012 thanks to the success of Candy Crush, a smartphone game that has topped the charts of the most downloaded apps since its launch. King Digital currently employs around 1,600 people. Activision Blizzard is a Californian company founded in 1979 and is one of the most important video game companies in the world, very strong especially for console games but less developed in the production of games for mobile phones. Activision Blizzard now employs almost 8,000 people and produces some of the most successful video games of recent years, including Warcraft and Call of Duty.

According to game industry experts, Activision's acquisition of King is part of an effort by the Californian company to expand into the smartphone games sector, which generated earnings of \in 32 billion in 2015. According to Activision, the acquisition of King is expected to increase the number of monthly users of the company's products to over 500 million.

The acquisition of King Digital helped Activision Blizzard to innovate its business model by obtaining managerial synergies as shown in the table below.

⁵Eikon Thomson Reuters, accessed 04/09/2021

Acquisition-Based Dynamic Capabilities	Micro-Foundations (Processes) of the Reconstruct of the Components of Acquirer Business Model
Identification, development, co-development, and assessment of technological opportunities concerning customer needs (sensing).	Activision sensed opportunities to expand its customer base, accelerate the gain of market share in the mobile business, and improve customers' productivity and experience.
Mobilization of resources to address needs and opportunities, and to capture value from doing so (seizing).	Activision captured value from combining their offers in the gaming industry with the existing mobile content of King.com providing to the target its own proprietary technology and its servers.
Continued renewal (transforming) customer relationships, new channels, and new customer value proposition.	The integration of King products into Activision, will increase the number of users and create a deeper relationship between different devices as well as between users.

Table 3.1: The micro-foundations of the reconstructs of the business model of Activision by acquisition-based dynamic capabilities.

The first valuation model used to measure dynamic capabilities-based synergies in M&A deal was based on the Black–Scholes option pricing model ⁶, namely: $C(S, t) = S0N(d1) - Ke^{-rxT}N(d2)$, where C (S, t) is call option price at time t; S0 is the price of the underlying asset at time 0; N(d1), N(d2) are the cumulative distribution functions of the standard normal distribution; K is the exercise price at time t; T is time in years; r is a risk-free rate; e is a mathematical constant approximately equal to 2.71828, the base of the natural logarithm; σ is expected volatility of an underlying asset's value. On 21 September 2020, the capitalization of Activision Blizzard was $\in 20.14$ bn ⁷; the capitalization of King Digital Entertainment was $\notin 4.35$ bn ⁸. The first valuation model used to measure dynamic capabilities-based synergies in M&A deals was based on the Black–Scholes option pricing model ⁹ as shown in Tables 2 and 3. Dynamic capabilities-based synergies of Microsoft's acquisition of LinkedIn are $\notin 3.21$ bn by BSOPM valuation. The valuation of the acquisition's synergies by the Binominal Option Pricing Model ("BOPM") is $\notin 3.25$ bn and given in Tables 4–6.

Since the total amount paid by Activision Blizzard for the takeover of King Digital Entertainment was $\notin 4.53$ bn and the LTM Revenues before the deal of the target were $\notin 1.82$ bn, the EV/Revs deal multiple was 2.48x. Comparing this amount with the mean of the M&A deal multiples in the mobile gaming industry, that is 3.7x ¹⁰it can be stated that Activision Blizzard makes a good deal in the acquisition of King.com

Once having calculated the binominal tree variables, the next step is to assess the possible payoff synergies and roll back the values using risk-neutral probabilities as given in Table 6.

⁶Black and Scholes, 1973

⁷Eikon Thomson Reuters, accessed 04/09/2021

⁸Orbis, accessed 04/09/2021

⁹Black and Scholes, 1973

¹⁰Introduction to Gaming Expertise, Alantra Report 2020

<i>S</i> (0)	The capitalization of Activision Blizzard was $\in 20.14$ bn; the capitalization of the target (King.com) was $\in 4.63$ bn. The total cumulative pre-deal capitalization was $\in 24.78$ bn.
K	The Activision Blizzard's last twelve-months (LTM) Revenues were € 4.20 and the LTM EV/REVs was 4.7x. The hypothetical future Market Value of
	Activision Blizzard was € 19.75 bn.
	The King.com last twelve-months (LTM) Revenues were € 1.82 bn and the LTM
	EV/REVs was 2.48x. The hypothetical future Market Value of Activision
	Blizzard was € 4.52 bn.
	So, the exercise price (K) was € 24.28 bn
Rf	The annualized risk-free rate US Long-Term Government Bond yield (1-year) on
,	03 November 2015 is 0.30%
Т	Duration to obtain synergy (T) of the deal is 1 year
σ	The volatility of future share price of Activision Blizzard in 2015 after the announcement of the deal is equals to 37.6%

Table 3.2: Option's variables to value dynamic capabilities-based synergies of Activision Blizzard and King.com M&A deal with BSOPM

Real Option Valuation with the Black-Scholes Option Pricing Model		
<i>S</i> (0)	The cumulative capitalization of Activision Blizzard and King.com before the announcement in 2016.	€ 24.78 bn
K	The cumulative theoretical market value of two separated entities without the acquisition after one year in 2017.	€ 24.28 bn
Rf	The annualized risk-free rate US Long-Term Government Bond yield (1-year) on 02 February 2016.	0.30%
Т	Time to expiration in year	1
σ	The volatility of future share price of Activision Blizzard 2016 after the announcement of the deal.	37.6 %
<i>d</i> 1		0.25
d2		-0.12
С	Value of the Call Option = Synergies	€ 3.94 bn

Table 3.3: Valuation of dynamic capabilities-based synergies with the Black–Scholes option pricing model: Activision's acquisition of King.com, in EUR bn

Parameters of the Binomial Option Pricing Model		
ΔT	Time Increment (years)	$\Delta T = T/N = 0.20$
u	Up factor	$u = e^{\sigma \sqrt{\Delta T}} = \frac{1}{d} = 1.136$
d	Down factor	$d = \frac{1}{u} = 0.879$
p	Risk-neutral probability	$p = \frac{e^{r\sqrt{\Delta T}} - d}{u - d} = 0.454$

Table 3.4: Recombining binomial lattice parameters (Activision's acquisition of King.com)



Table 3.5: BOPM lattice of the underline values of Activision Blizzard after the acquisition of King Digital Entertainment (in EUR bn)



Table 3.6: BOPM of real options lattice: a value of Activision synergies of the acquisition of King.com (in EUR bn)

Once the inputs were obtained, it was possible to proceed with the construction of the binomial trees for the option, in order to be able to capture an accurate trade-off between a linear evolution of the examined business and the multiple scenarios that can be hypothesized. The first of the binomial trees shown above represents the evolution of the underlying, i.e. the value that the group examined will be able to reach following the evolution of the projects not yet implemented; the use of the binomial tree makes it possible to represent the possibility that the size of the market grows in an exceptional way, according to different possible development scenarios, or that it remains substantially unchanged in the time span considered, or that it turns out to be a failure. The total number of possible outcomes at maturity is 6, with 5 nodes considered, but a higher number of outcomes could have been obtained if the width of the sub-intervals considered had been reduced or if the time horizon for the development of the option had been extended. The different scenario hypotheses envisaged can occur on the basis of objective probabilities, p and (1 - p), defined according to the risk-neutrality assumption underlying the model used, according to the formulas indicated above. Having constructed the first tree, all the payoffs to maturity were calculated, subtracting the strike price set ex ante from the values of the underlying in the last nodes; since it is a call option, the payoff to maturity is equal to:

$$max[S(T) - X; 0]$$

We then proceeded backwards to determine the price of the option inherent in the group's investment project. To do this, all the payoffs were discounted considering the nodes according to the generic formula, already recalled:

$$f = [fu \ast p + fd \ast (1-p)] \ast e^{-\sigma \Delta t}$$

Thus, the option premium was determined, i.e. the present value of the growth option implicit in the project, which was added to the present value of the company valued through the method of market multiples.

The acquiring company was valued taking into consideration the asset side Enterprise Value / Revenue multiple, It should be noted that, to avoid the risk of duplication with what was analyzed previously, it was decided to consider the Last Twelve Months Trailing multiples prior to the announcement of the deal.

Thus, the forecasted market capitalization of Activision Blizzard in one year after the acquisition of LinkedIn is the cumulative capitalization of a target and an acquirer before the announcement—(So) \in 24.08 bn plus estimated synergies of \in 3.2 bn, which equals \in 27.2 bn of Acquirer Market Capitalization after 1 year. Therefore, expected synergies were fully realized and the added market value even bigger than predicted. Having compared the calculated option value with the takeover premium paid, that is \in 0.28 bn, it is possible to state that this acquisition added market value to Activision thanks to dynamic capabilities-based synergy.

3.3.2 Case Study II: Microsoft Corporation acquires ZeniMax Media Inc.

On 21/09/2020 Microsoft has confirmed that is entered in the process for the acquision of ZeniMax Media, a tech company that owns a large number of top-tier software houses.

A possible large acquisition by Microsoft has been rumoured for a while and was initially thought to be in the direction of Warner Bros. The acquisition cost the Redmond-based company \notin 6.33 billion, and it can now count on controlling some of the most important software houses in the gaming sector, representing one of the top-10 most expensive acquisition of the gaming industry ever.

Phil Spencer, executive Vice President of Gaming at Microsoft, has confirmed that current commitments will be honoured to enhance players experience and that Microsoft will aim to make the most of the new acquisition in order to further strengthen the Game Pass offering and push its new next gen consoles with many quality titles that could seriously increase the market share in favour of its company. The next gen challenge is as tight as ever, and Microsoft, with its console Xbox, seems intent on reaffirming its desire to fight it as hard as it can.

The reasons behind such importance lie in a number of huge benefits for gamers in the immediate future. The union between Xbox, Bethesda Softworks, MachineGames, id Software, Arkane and the other studios of the American company, in fact, appears as an agreement to broaden the horizons of both companies, offering more resources to guarantee better productions accessible to the majority of players.

The concept of "exclusivity", as it has always been understood in the video game scene, takes on a different connotation, not bound to the possession of a specific hardware in order to enjoy a certain product, but oriented towards the exclusive availability of a production within a wider and more challenging ecosystem.

The market reaction over the announcement of the deal was extremely good for the acquirer. The share price of Microsoft increased from € 169.29 on 18/September/2020 (three days before the announcement of the deal) to € 177.19 on 22/September/2020, representing a 4.6 % increase in only four days.¹¹

This transaction represents a unique opportunity for both firms to innovate their business model and exploit economies of scale useful to be at the top of the competition in the following years. In particular the acquisition-based dynamic capabilities helped Microsoft to innovate its business model by getting managerial synergies as shown in table 7.

¹¹Eikon Thomson Reuters, accessed 04/09/2021

Acquisition-Based Dynamic Capabilities	Micro-Foundations (Processes) of the Reconstruct of the Components of Acquirer Business Model
Identification, development, co-development, and assessment of technological opportunities concerning customer needs (sensing).	Microsoft sensed opportunities to expand its product offer, accelerate the gain of market share in the video games industry, and improve customers' experience.
Mobilization of resources to address needs and opportunities, and to capture value from doing so (seizing).	Microsoft seized an important brand name as Zenimax and its user base to its business. That transaction will increase Microsoft level of technology to maintain a dominant position in the video games industry.
Continued renewal (transforming) customer relationships, new channels, and new customer value proposition.	The integration of Zenimax offer into Microsoft, will increase the number of users and create a deeper relationship between different devices as well as between users. The acquisition helps Activision to establish a "strong mobile presence".

Table 3.7: The micro-foundations of the reconstructs of the business model of Activision by acquisition-based dynamic capabilities

The first valuation model used to measure dynamic capabilities-based synergies in M&A deal was based on the Black–Scholes option pricing model, namely: $C(S,t) = S0N(d1) - Ke^{-rT}N(d2)$, where C(S, t) is call option price at time t; S0 is the price of the underlying asset at time 0; N(d1), N(d2) are the cumulative distribution functions of the standard normal distribution; K is the exercise price at time t; T is time in years; r is a risk-free rate; e is a mathematical constant approximately equal to 2.71828, the base of the natural logarithm; σ is expected volatility of an underlying asset's value. On 21 September 2020, the capitalization of Microsoft inc. was $\notin 1,358.3$ bn ¹²; the capitalization of Zenimax Media was $\notin 5.8$ bn ¹³. The first valuation model used to measure dynamic capabilities-based synergies in M&A deals was based on the Black–Scholes option pricing model as shown in Tables 8 and 9. Dynamic capabilities-based synergies of Microsoft's acquisition of Zenimax are $\notin 110.61$ bn by BSOPM valuation. The valuation of the acquisition's synergies by the Binominal Option Pricing Model is $\notin 113.52$ bn and given in Tables 10–12.

¹²Eikon Thomson Reuters, accessed 04/09/2021

¹³Orbis, accessed 04/09/2021

<i>S</i> (0)	The capitalization of Microsoft was \in 1,358.3 bn; the capitalization of the target (Zenimax) was \in 6.3 bn. The total cumulative pre-deal capitalization was \in 1,364.7 bn.
K	The Microsoft's last twelve-months (LTM) Revenues were € 129.4 bn and the LTM EV/REVs was 4.7x. The hypothetical future Market Value of Microsoft was
	€ 1,317.4 bn.
	The Zenimax last twelve-months (LTM) Revenues were $\in 0.5$ bn and the LTM
	EV/REVs was 11.7x. The hypothetical future Market Value of Activision
	Blizzard was € 6.32 bn.
	So, the exercise price (K) was \in 1,323.75 bn.
Rf	The annualized risk-free rate US Long-Term Government Bond yield (1-year) on
,	21 September 2020 is 0.12%.
Т	Duration to obtain synergy (T) of the deal is 1 year.
σ	The volatility of future share price of Activision Blizzard in 2015 after the announcement of the deal is equals to 20.9%.

Table 3.8: Option's variables to value dynamic capabilities-based synergies of Microsoft and Zenimax M&A deal with BSOPM

Real Option Valuation with the Black-Scholes Option Pricing Model		
<i>S</i> (0)	The cumulative capitalization of Microsoft and Zenimax before the announcement in 2020.	€ 1,364.7 bn
K	The cumulative theoretical market value of two separated entities without the acquisition after one year in 2021.	€ 1,323.75 bn
Rf	The annualized risk-free rate US Long-Term Government Bond yield (1-year) on 21 September 2020.	0.12%
Т	Time to expiration in year.	1
σ	The volatility of future share price of Activision Blizzard 2016 after the announcement of the deal.	20.9 %
<i>d</i> 1		0.25
d2		0.04
С	Value of the Call Option = Synergies	€ 134.33 bn

Table 3.9: Valuation of dynamic capabilities-based synergies with the Black–Scholes option pricing model: Microsoft's acquisition of Zenimax, in EUR bn

Parameters of the Binomial Option Pricing Model		
ΔT	Time Increment (years)	$\Delta T = T/N = 0.20$
u	Up factor	$u = e^{\sigma \sqrt{\Delta T}} = \frac{1}{d} = 1.098$
d	Down factor	$d = \frac{1}{u} = 0.91$
p	Risk-neutral probability	$p = \frac{e^{r\sqrt{\Delta T}} - d}{u - d} = 0.473$

Table 3.10: Recombining binomial lattice parameters (Activision's acquisition of King.com)

Since the total amount paid by Microsoft for the takeover of Zenimax Media was \in 6.33 bn and the LTM Revenues before the deal of the target were \notin 0.5 bn, the EV/Revs deal multiple was 11.7x. Comparing this amount with the mean of the M&A deal multiples in the video games industry, that is 5.0x the revenues of the target, ¹⁴ it seems that Microsoft overpaid the target. But, analyzing the business model of the acquired company, it can be demonstrated that Zenimax Media has a high potential growth in terms of revenues and profitability of the business. Such target can be classified in the Media and Entertainment industry, that is still in a maturity phase, characterized by the willingness to maximize KPIs as number of users and viewers, rather than profits. According Statista.com that industry has the highest average valuation multiples worldwide ¹⁵, just to have a benchmark of comparison, in the above mentioned industry companies as Twich and Spotify take part, whose acquisition multiple was, respectively, +70x and 15x their revenues. ¹⁶. So, it can be stated that Microsoft makes a deal in line with other takeovers in that industry for the acquisition of Zenimax Media.

Once calculating the binominal tree variables, the next step is to assess the possible payoff synergies and roll back the values using risk-neutral probabilities as given in Table 12.



Table 3.11: BOPM lattice of the underline values of Microsoft after the acquisition of King Digital Entertainment (in EUR bn)

¹⁴Introduction to Gaming Expertise, Alantra Report 2020

¹⁵https://www.statista.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertising-sectors.com/statistics/1030100/enterprise-value-to-ebitda-in-the-media-and-advertistics/1030100/enterprise-value-to-ebitda-in-the-media-advertistics/1030100/enterprise-value-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebitda-in-to-ebit

¹⁶https://rufuspollock.com/2014/11/01/amazon-twitch-acquisition-paying-70x-sales/


Table 3.12: BOPM of real options lattice: a value of Microsoft synergies of the acquisition of Zenimax (in EUR bn)

Thus, the forecasted market capitalization of Microsoft in one year after the acquisition of ZeniMax is the cumulative capitalization of a target and an acquirer before the announcement—(So) \notin 1,364.2 bn plus estimated synergies of \notin 110.6 bn, which equals \notin 1,474.8 bn of Acquirer Market Capitalization after 1 year. Therefore, expected synergies were fully realized and the added market value even bigger than predicted. Having compared the calculated option value with the takeover premium paid, that is \notin 0.53 bn, it can be stated that this acquisition creates value to Microsoft Corporation shareholders thanks to dynamic capabilities-based synergy.

Making a comparison between the acquisition of King.com (2015) and the acquisition of Zenimax (2020), it's important to note how the premium paid for the acquisition of the majority of the stakes is greater in the second case. That is due to the historical moment that characterized 2020. With the restrictions measures adopted by governments worldwide due to the spread of Covid-19 pandemic, the gaming market is living a unique period of growth. All the main KPIs of the industry, as numbers of users and profitability of them, have suddenly increased after the lockdown measures, increasing the expectations of the market about the future. Such a more optimistic scenario is reflected in the claims of the target companies as well as the availability of the acquirers to pay an higher premium for the takeovers.

The real option pricing method, assessing the synergies that are expected after the announcement of a deal, is a effective valuation method to compare the premium paid and the possible value that the acquisition will bring to the acquirer companies.

Conclusions

As analyzed in the previous paragraphs, it is evident that the gaming world is one of the most rapidly upgrading of all sectors, as well as one of the most dynamic and unpredictable one. Companies have to continuously adapt to changes in the interest and perceived value of consumers. Mergers and acquisitions are therefore a valuable tool to react quickly to such changes, but it is not always easy to correctly measure possible synergies, especially in such a changing environment. Literature focused on demonstrating that during unstable times, the traditional methods of valuation of the economic capital of a company, in particular the Discounted Cash Flow ("DCF"), is not the most appropriate method to assess the value of a company. In particular, the DCF, determines the value of the company by estimating, depending on the type of method chosen (levered or unlevered), the expected future cash flows that the company being valued will be able to generate over a given period of time. In this way, it is possible to identify the basic "stand alone" value of the company examined, including the value of the economies and synergies that characterize its activity.

The real options approach, on the other hand, allows the evaluator to consider the "something extra" intrinsic to the target company, i.e. those opportunities that the management of the company being evaluated might be able to exploit in the implementation of certain projects or investments.

The use of options may be simpler to use, despite the appearance of greater complexity of the mathematical foundations on which the calculation of the premium for the identified options is based: it requires the use of fewer parameters which, moreover, do not have to be estimated year by year. The downside could be a loss of significance of the values arrived at, but a greater simplicity in carrying out the valuation.

A further advantage is the greater ability to consider the number and variety of future scenarios, which is very useful when operating in highly uncertain environments. In fact, the discounting of cash flows assumes only one evolutionary scenario, and considers uncertainty only in terms of the remuneration offered for the investment risk, in order to calculate the rate at which to discount the expected cash flows (usually assuming a constant rate for the entire period considered). The real options approach, on the other hand, enables to assume and represent a wide range of future scenarios, attributing to each of them an objective probability of occurrence. The consequence of this consideration is that, compared to discounting cash flows, which provides a static view of reality, the real options model allows to capture the instability of evolutionary scenarios in contexts of high uncertainty and the ability of management. It is therefore the most appropriate valuation method for the specific historical moment in which the gaming industry, and in particular the eSports segment, finds itself. Although

the prospects and growth forecasts are super optimistic for the many reasons listed above, most of the players in the sector are still struggling to monetise their businesses and EBITDA margins are not always positive. This characteristic means that acquiring companies interested in conducting an M&A deal engage targets with very high market multiples and immature businesses, which greatly increase the risk of value creation for the acquirers' shareholders.

It is therefore vital for the success of a transaction that the management of the acquiring company has the dynamic capabilities to manage the process of integrating the team as well as the general business model of the target. This was the case with the studied companies. It has been demonstrated that both acquirers, Activision Blizzard and Microsoft, have been able to create significant synergies within a one-year time horizon with the consequent creation of shareholder value. This success is partly due to the organisational chart and the team of the two acquiring companies, which are very active in terms of M&A with entire internal teams dedicated to finding the right targets and oriented towards value maximisation. This confirms the theory mentioned in chapter 2, according to which the experience of the management influences the success of a transaction.

A limitation of this study is that it is circumscribed to a single valuation approach, that of real options, due to the lack of availability of significant data, such as the forecasts of the budgeting and business planning operations of the acquiring companies.

Future researches can focus their efforts on comparing the results obtained from the real options analysis with a Discounted Cash Flow valuation, in order to have a higher degree of significance in the assessment of value creation.

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