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From start-up to IPO: a financial valuation of Airbnb

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Introduction

Over the last 20 years, start-ups have gained great importance in the world economy. Innovative start-ups have become sources of inspiration for many entrepreneurs to start working on their own business idea.

The term start start-up is known by almost everyone, also by people who have no knowledge and expertise in the business field. Many people know this term but not all of them really know what a start-up is. If the definition of start-up is somewhat complicated for many people, performing a financial valuation of this kind of companies is something even harder. Their definition and the way their financial valuations are performed are strictly linked, since, in order to understand how to perform a financial valuation of start-ups, a precise knowledge of their business and financial characteristics is required.

Providing correct valuations of start-ups is important, as they have started playing a significant role also in the public stock markets. In fact, the most successful start-ups, after going through several stages during their lifecycle, end up being acquired by other larger companies or going public through IPOs. In particular, especially for those start-ups that have revolutionized an industry, when the time of their IPO comes, it catches the interest of many people, such as, investors, media, competitors, and so on.

Airbnb is a clear example of a start-up that has revolutionized an industry, namely the hotel industry, by developing an innovative business model and whose IPO has been quite hyped by media since the company filed the prospectus on the 16th of December 2020, but rumors of going public had started in 2016.

Airbnb went public on the 10th of December 2020 and at that time, the company was in a very late stage of the start-up's lifecycle, as it was one of the most known unicorns all over the world, having recorded a valuation of $18 billion in April 2020 in a private fundraising round. Airbnb's IPO was the biggest IPO in the U.S. in 2020, the company opened at $146 on the Nasdaq, far above the IPO price of $68; during the first day of trading, Airbnb's share price reached a peak of $165 and closed at $144,71.

Research question

This thesis aims to understand if the valuation of Airbnb, at the moment of its IPO and on the first day of trading, was justified by the fundamentals of the company. This kind of analysis is very common and interesting when it comes to companies' IPOs. In fact, over the last years many firms that have gone public have been under-priced meaning that at the moment of their IPOs, their shares have been valued at a price which is lower than that at which they are traded on the first days of trading. The purpose of this thesis is to investigate if the main drivers of Airbnb's valuation are its fundamentals or other factors that are able to affect its value. A comparison between the value obtained from this work and the share prices, at the moment of its IPO and at the end of its first day of trading, is made to understand if these two values are somehow in line and consistent with Airbnb's fundamentals or not.

Research methodology

To answer this question, the discounted cash flow method (DCF) and the multiples methodology have been applied. These methodologies have been used to define the share price of Airbnb in order to make it possible to compare this price with that of the IPO and the first day of trading. To better understand this analysis, the thesis has been divided into three chapters.

In the first chapter, an overview of what a start-up is provided. This section covers some of the several existing definitions of the start-up term, providing also an idea of what the business and financial characteristics of this specific type of organizations are. Then, the first chapter talks about the stages of start-ups' lifecycle and the several ways a start-up can be funded. In this section of the thesis, the main exit ways for such companies are introduced and the exit trends of the last years for start-ups are highlighted.

The second chapter gives a theoretical explanation of the most used traditional methodologies for performing a financial valuation of a company. Furthermore, in this section the most important financial valuation methodologies created ad hoc for start-ups are discussed.

The third and last chapter talks about Airbnb's history and its journey from start-up to IPO. In addition, the business model of Airbnb is described in a very detailed way by using the Business Model Canvas tool. Finally, a detailed explanation of the application of the DCF and multiples methodologies is provided. In this chapter, all the assumptions and the reasoning made for estimating the stock price of Airbnb at the moment of its IPO are discussed.

1. The start-ups' world

1.1 Definitions of start-ups

When it comes to the term start-up, it is important to realize that there is no unique definition for this kind of companies. For this reason, a good starting point might be to go through some of the definitions of this term. Paul Graham, a venture capitalist and the co-founder of an important start-up accelerator and seed capital firm called "Y Combinator", says that "a start-up is a company designed to grow fast"[1]. In this case, growth is clearly highlighted as one of the most important aspects of this kind of companies. In line with this last definition, Steve Blank, an entrepreneur known for having created the customer development method and having launched the lean start-up movement, and Bob Dorf, known as the "guru" of start-ups, claim that "a start-up is a temporary organization designed to search for a repeatable and scalable business model, working under conditions of extreme uncertainty"[2]. This statement of meaning makes it clear that being a start-up is not forever since the term refers to a transitionary phase of a company. Furthermore, this definition also focuses on the concept of growth through the expression "repeatable and scalable business model" referring to these companies' goal of finding a new business model to be applied to new products and markets to generate sustained growth. In addition, this sentence specifies that when it comes to start-ups also the term uncertainty plays a role representing an extremely significant characteristic; in fact, this instability directly affects their valuations and their feasibility and viability. Some authors have given a definition setting up more precise standards; for instance, David and Roster[3] claim that a start-up is a company with these features:

1. minimum of 50 and maximum of 150 employees
2. less than 10 years old
3. independent
4. in a limited geographic area

There are also some other definitions that might be deemed more sentimental as the one provided by Jessica Malfatto[4], co-founder of Disclosers, where start-ups are considered ideas and entrepreneurial creatures that have become concrete projects leading to an initial moment in the life of a company. Finally, it might be useful to keep in mind a broad and clear definition that covers most of the points mentioned above, which is the

[1] Definition retrieved from www.paulgraham.com
[2] Blank, S., Dorf, B. (2014). *The Start-ups Owner's Manual: The Step by-Step Guide for Building a Great Company.* K&S Ranch, Inc.
[3] Davila, A., Foster, G. (2005). *Management accounting systems adoption decisions: evidence and performance implications from early-stage/startup companies.* The Accounting Review, 80(4), 1039-1068. Retrieved from: https://doi.org/10.2308/accr.2005.80.4.1039
[4] Malfatto, J. (2014). *Viaggio nella nuova imprenditoria. Startup e innovazione in Italia*. Historica Edizioni.

following: “a start-up company is an entrepreneurial venture which is typically a newly emerged, fast-growing business that aims to meet a marketplace need by developing a viable business model around an innovative product, service, process or a platform. A start-up is usually a company designed to effectively develop and validate a scalable business model” (Sivitska, Y., 2018)[5].

1.2 Business and financial characteristics

After having seen several definitions of the term start-up, it is possible to summarize the most important features both from a business and a financial point of view. While the features related to the business area are more evident and can be intuitively understood by simply reading the definitions, those that are financial need to be better explained and clearly listed.

From a business point of view, it can be said that start-ups share 6 crucial characteristics:

1. new business model: as previously mentioned in one of the definitions provided, start-ups are companies looking for a business model. In particular, this means that they do not use business models already implemented and adopted by traditional organizations, but they strive to develop new business models that enable them to capture value from customers and turn it into revenue for the company. Examples of new business model are: Deliveroo that positions itself in between customers who want to eat food and restaurants, pubs and bars who are serving food by capturing value from both and turn it into revenue; Airbnb, that operates as an intermediary between house holders and people who want to rent an apartment and many others.
2. Repeatability: the business model of this kind of companies must be not only new but also repeatable. A business model is repeatable when the start-up is capable of providing customers with its product or service with no inventory limit regardless of demand and with little need for customization and adaptation (De Oliveira, F. B., Zotes, L. P., 2018)[6]. This means that the firm is able to replicate its business model in several geographic areas and periods of time without violating its nature.
3. Scalability: another adjective that must be related to start-ups’ business models is scalable. A business model is scalable when it enables the company to change in size by acquiring new customers. In other words, scalability of business models refers to the company’s ability of making revenue increase much more than costs with its investments.

[5] Sivitska, Y. (2018). *Features of valuation of startup companies.* Consulting “Forex”.
[6] De Oliveira, F. B., Zotes, L. P. (2018). *Valuation methodologies for business startups: a bibliographical study and survey.* Brazilian Journal of Operations & Production Management.

4. Innovation: it is an intrinsic feature for this type of organizations since they come up with new products and services by using and exploiting innovative technologies to meet new customers' needs or even to create new needs for them.
5. Uncertainty: if it is true that by definition the future is uncertain for every organization, it is even truer for start-ups. In fact, start-ups operate in conditions of extreme uncertainty since regardless of the market analysis, financial and operational viability that are behind the creation of such companies, they have no certainty regarding the success of the project and the acceptance by the customer (De Oliveira, F. B., Zotes, L. P., 2018)[7].
6. Temporary nature: in one of the definitions, it is clearly said that start-ups are temporary organizations, meaning that thinking of start-ups as particular type of companies is somehow not completely correct since this term refers more to the initial moment of the lifecycle of a company; the duration of this phase depends on many factors but what is certain is that no start-up is intended to stay a start-up forever.

When it comes to the financial characteristics of start-ups, it's feasible to say that they all produce negative economic results, which are characterized by negative net earnings most of the time. This is due to the fact that, at first, start-ups must validate their products and services, as well as their business model, and make them known to clients, resulting in a situation in which sales generated are significantly lower than fixed costs. For start-ups an ideal financial structure does not exist, but there are various pro-tempore structures that can be more or less suitable. A continuous and changing balance between sources of financing is of paramount importance and financial decisions must be made in this direction. In reality, the organization's strategic profile is crucial in choosing the best debt-to-equity ratio. It indicates that there must be a match between the financial structure of the company and the level of risk it faces as a result of its business actions (Donna, G., 1996)[8]. As a result, for companies with high growth potential operating in fast-moving industries with high levels of operational risk, such as start-ups, the most appropriate solution is to use primarily equity, since implementing a financial structure with a significant portion of debt increases financial risk, and therefore it is a strategy better suited for companies operating in mature industries with lower operational risk. However, in the start-up phase of a business, achieving a high degree of financial elasticity is critical; to do so, the creation of credit balances can be extremely useful because the chances that something unexpected or different from what is foreseen in the financial plans is truly plausible as planning with no company history as guidance truly gets complicated, especially in fast-growing industries that rely on variables that are unmanageable and unpredictable by the founder or management. A right mix of sources might also help to lower the cost of funding. In fact, in high-growth situations, a balanced expansion might be allowed by the introduction of equity while avoiding financial risk from rising too quickly, resulting in unfavourable repercussions such as

[7] De Oliveira, F. B., Zotes, L. P. (2018). *Valuation methodologies for business startups: a bibliographical study and survey.* Brazilian Journal of Operations & Production Management.
[8] Donna, G. (1996). *Uno strumento al servizio della competitività, ne L'impresa*.

greater premium expectations and, as a result, a higher cost of capital. At this point for start-ups, the strong presence of equity can be interpreted not only as a mandatory choice owing to the difficulty of accessing bank financing, mainly due to insufficient guarantees, low liquidity, as well as the existence of a significant information asymmetry between entrepreneurs and investors but also as a desirable situation for such companies facing negative economic results, since a notable level of capitalization allows them to absorb losses, avoiding situations of failure (Cosh, A., Cumming, D., Hughes, A., 2009)[9]. On the one hand, debt adds to a company's immediate development; on the other hand, it limits its future development since, as the leverage ratio increases, future self-financing cannot be used to promote development because it would be absorbed by servicing past debt.

1.3 The main stages of start-ups' lifecycle

Sometimes, start-ups are considered to be ideas, this is partially true but as it was easily understandable from the several definitions provided previously thinking of a start-up as only an idea is incorrect and reductive. For such a company to be successful there is a clear path to follow with a set of activities that are necessary to turn the initial idea into a true business. Even though being a start-up refers to a transitional phase in the lifecycle of an organization, it is possible to define a lifecycle even for start-ups with several stages. Max Marmer[10], the founder of *Start-up Genome*, defines a life cycle for such organizations composed of 6 stages:

1. Discovery: this first stage, whose duration is between 5 and 7 months, sees the creation of the team and the development of an initial MVP (Minimum Viable Product) model. At this point, the founder has to analyse and better study the business idea and the product's or service's potential of being appreciated by the market. In this phase, founders usually get in contact with accelerators and incubators to obtain resources and ask experts, which are called mentors, for help.
2. Validation: in this stage lasting between 3 and 5 months start-ups start receiving the first funds called seed funding which is used to design the product or service. Here, the company begins to practically understand if there are customers interested in buying that product or service and, eventually, the first sales are generated.
3. Efficiency: this is the phase where between 5 and 6 months are spent on seeking efficiency both in terms of "production" and customer relationship. The team strives to improve the business model through the repeatability and scalability of the sale and customer acquisition processes.

[9] Cosh, A., Cumming, D., Hughes, A. (2009). *Outside Entrepreneurial Capital.* The economic journal.
[10] Marmer M., Herrmann, B. L., Dogrultan, E., Berman, R. (2012*). Startup Genome Report: A new framework for understanding why startups succeed.* Startup Genome.

4. Scale: in this stage, whose duration is between 7 and 9 months, start-ups strive to increase remarkably their customer base, also by entering new foreign markets, and attempts to scale up their production, even by hiring new staff and restructuring the organizational chart.
5. Maintenance: this is the phase where the start-ups are called to keep their projects up and to continue running their business in the best possible way.
6. Sale or renewal: in the last stage, such organizations can rely on business models that work well. At this point, the founder has two options: either selling the company or going public.

1.4 How start-ups are financed

After having previously mentioned some financial characteristics of start-ups, it is important to understand how they are financed and why it is important for them to get money. Truth to be told, having access to new amounts of money is beneficial and significant for every company, but for start-ups, it is even more. In fact, starting a business from scratch means that a lot of investments are necessary if the goal is to turn an idea into a real firm. Money is crucial for start-ups since typically founders have no robust financial resources, but they need some to finance and sustain their projects. When talking about start-ups financing it is possible to define three stages of a start-up life cycle on which the amount and the purposes of the investments depend (Goldberg, R. T., 2012)[11] (**Figure 1**):

1. Early stage: in this phase, the riskiness of the project is high since there is only a business idea whose feasibility still has to be confirmed. At this moment, there is the pre-seed funding phase where money is invested by founders and the so-called supporters "3F", who are represented by family, friends, and fools, meaning those people who invest because emotionally attached to the founders or because intuitively convinced about the idea. Then, there is the seed funding phase where the main investors are business angels, public institutions, and incubators, who provide such companies with money for improving the product or service and cover the initial expenditures. Once the product or service has been validated by customers and the business model has demonstrated to work well and to have growth potential, the start-up can look for new investors through Series A rounds. In this kind of rounds normally investors are represented by Venture capital funds providing start-ups with financial resources to enable them to hire new staff, make investments in PPE[12] and implement marketing campaigns before launching the product on the market, who in exchange ask for an equity stake.

[11] Goldberg, R. T. (2012). *An Introduction to Startup Financing and a New Approach to Attracting Capital Resources.* StartupFactory LLC.
[12] Property, plant, and equipment.

2. Expansion stage: in this stage, the firm has already achieved some positive results generating the first sales, but it can seek new funds through Series B rounds to focus on profits and expand the business by enlarging the team, entering new markets, and scaling up sales. Also, during this phase start-ups can go for Series C rounds to keep on expanding the business and become the leader in the market by making strategic acquisitions to acquire top talents and beat the competition.
3. Late stage: in this last stage start-ups prefer to get new funds that have no dilution effect on equity but since getting access to bank loans is too expensive, they rely on hybrid forms of investment which are typically the mezzanine capital and the bridge loans. Mezzanine capital allows the company to get new funds while providing investors with a portion of the profits if the project turns out to be successful (Dec, P., Masiukiewicz, P., 2017)[13]. Bridge loans are short-term loans that are issued to reach sooner the short-run goals or in preparation for a future IPO[14] (Morghen, P., 2021)[15]. As a matter of fact, the last stage of the start-up funding cycle coincides with the liquidation of shares by shareholders, either through acquisition operations by other companies, IPOs, or LBOs[16].

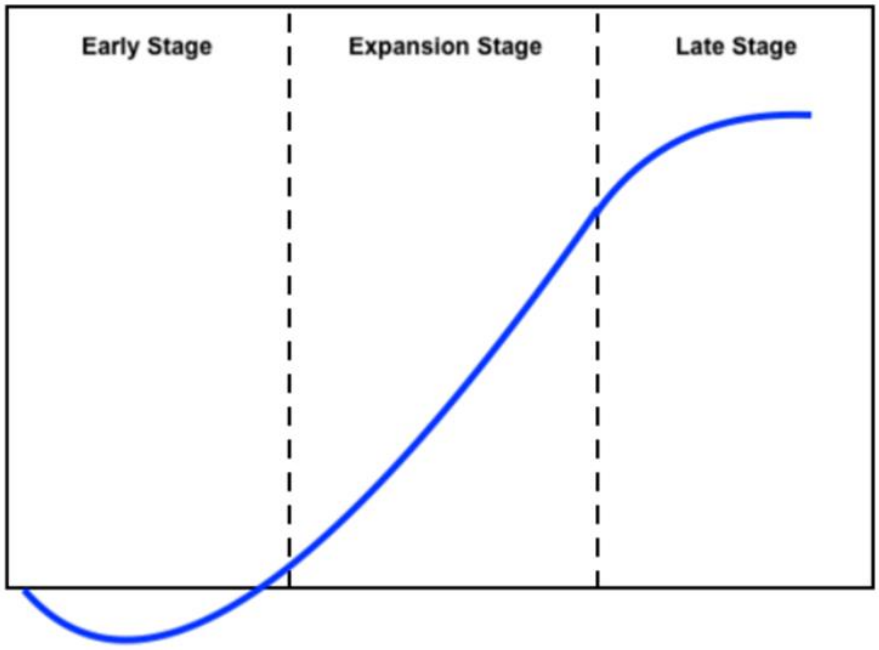

Figure 1: A start-up's typical funding cycle. The graph was created by the author. (Source: Goldberg, R. T., 2012).

[13] Dec, P., Masiukiewicz, P. (2017). *Mezzanine Capital as A Tool to Increase Enterprise Value in Crisis.* Macrothink Institute.
[14] An initial public offering (IPO) refers to the process of offering shares of a private corporation to the public in a new stock issuance. An IPO allows a company to raise capital from public investors.
[15] Morghen, P. (2021). *Mappatura delle start-up Verdi in Italia.*

[16] A leveraged buyout (LBO) is the acquisition of another company using a significant amount of borrowed money (bonds or loans) to meet the cost of acquisition.

At this point, it is time to describe and analyse the characteristics and the role of the several types of investors in a more detailed way.

1.5 Business angels

There are several definitions of business angels. According to Mason and Harrison[17], a business angel is: "an individual, acting alone or in a formal or informal syndicate, who invests his own money directly in an unquoted business in which there is no family connection and who, after making the investment, takes an active involvement in the business, for example, as an advisor or member of the board of directors". Another definition is the following (Fiti, T., Markovska, H.V., Bateman, M., 2007)[18]: "business angels are individuals who have available financial means and are ready to invest in entrepreneurship ideas". They are typically people from 40 to 65 years old with a university diploma and professional qualifications who have gained enough business experience and earned enough money. Business angels are wealthy people whose typical investments are between 15 and 250 thousand dollars (Flynn, A., 2021)[19]. What makes them different from institutional investors of high-risk capital whose funds come from sources such as pension funds, banks, and insurance companies that are legally obliged to make less risky investments, is that fact that business angels invest personal assets (Ramadani, V., 2009)[20]. Since they have gained business experience over time, they tend to make investment decisions that very often imply a significant dose of risk. They also tend to invest in start-ups that are geographically close to them and that are not listed on any stock market; this can be seen as a result of business angels' willingness to actively participate in running the business. In fact, they invest in the early stage of start-ups providing them mostly with pre-seed and seed funds also because it is the stage where business angels can contribute the most to the development of the business. In the literature, authors have described many types of business angels, but the basic ones are the following (Ramadani, V., 2009)[21]:

- Active angels: who have experience in investments and keep on searching for more investments.
- Latent angels: who are passive investors that have past investment experience but have not invested in the last 3 years.
- Virgin angels: who have not made their first investment yet.

[17] Mason, C. M., Harrison, R. T. (2008). *Developing Time Series Data on the Size and Scope of the UK Business Angel Market.* BERR, URN 08/ 1152.
[18] Fiti, T., Markovska, H.V., Bateman, M. (2007). *Pretpriem-nishtvo (Entrepreneurship), 2nd edn*. Faculty of Economics: Skopje
[19] Flynn, A. (2021). *How much do the average angel investors invest?.* Retrieved from: Greedhead.net.
How much do the average angel investors invest? – Greedhead.net,
[20] Ramadani, V. (2009). *Business angels: who they really are.* Strategic change.
[21] Ramadani, V. (2009). *Business angels: who they really are.* Strategic change.

Business angels invest for several reasons (**Figure 2**) that go from the return of investment which tends to be between 20 and 30 percent (Goldberg, R. T., 2012)[22] and finding a workplace for themselves. Here is a figure that summarizes the several reasons why they invest in start-ups:

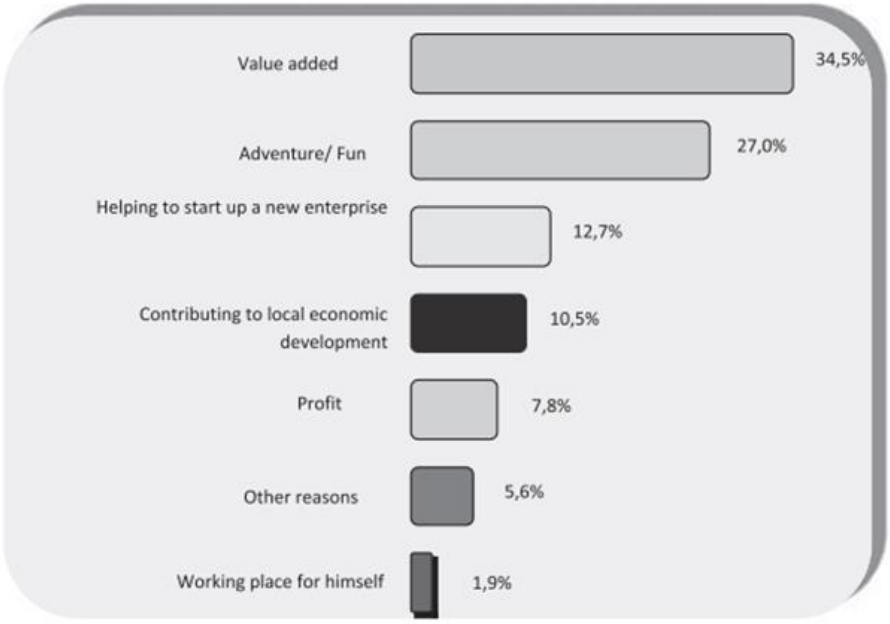

Figure 2: Business angels' motives for investing. (Source: France angels, Business Angels Survey 2003, CDC PM, January 2004, sl.22).

In the literature, there is evidence that start-ups financed by business angels are more likely to get funded by venture capital funds (Madill, J. J., Haines, G. H., Riding, A. L., 2005)[23].

[22] Goldberg, R. T. (2012). *An Introduction to Startup Financing and a New Approach to Attracting Capital Resources.* StartupFactory LLC.
[23] Madill, J. J., Haines, G. H., Riding, A. L. (2005). *The Role of Angels in Technology SMEs: A Link to Venture Capital.* Venture Capital 7.2, pp. 107-129.

1.6 Venture capital funds

Another fundamental source of financing for start-ups is represented by Venture capital funds. A clear and precise definition of Venture capital funds is the following: "Venture capital funds are pooled investment funds that manage the money of investors who seek private equity stakes in start-ups and small- to medium-sized enterprises with strong growth potential"[24]. They differ from business angels for money invested and for the timing of investments. In fact, these funds provide start-ups with money in the very last moments of the early stage, meaning when the firm looks for a Series A round; they keep on investing in start-up also with Series B, C and beyond rounds, providing impressive amounts of money in the range of millions of dollars. It is possible to claim that venture capital funds and business angels are not alternatives, but they complement each other. Business angels invest smaller amount of money in the very early stages of a start-up allowing it to start developing the product or service, better defining the business model and making the first sales, on the other hand, venture capital funds provide huge amounts of money enabling the start-up to organize itself in a more professional and efficient way. In fact, with the funds provided by venture capitalists start-ups can execute activities of strategic and tax planning, do marketing campaigns and manage human resources (Hellmann, T., Puri M., 2002)[25]. Another difference between business angels and Venture capital funds is that business angels invest their own money whereas Venture capitalists invest money not directly owned but that they are called to manage from a financial point of view. Given this difference, the sense of emotional commitment is much higher for business angels rather than for Venture capital funds, that look more for objective results (Fairchild, R., 2011)[26]. In line with this, there is also an important difference between business angels and venture capitalist when it comes to the contract of the deal: the former tends to be more flexible when defining the terms of the agreement, allowing also to make change along the path, whereas the latter requires clarity and accuracy regarding the terms and conditions of the contract from the beginning (Van Osnabrugge, M., 2000)[27]. In addition, Venture capital funds invest money in exchange for equity stakes of the firm and decision rights in its board. A return of between 30 and 50 percent per year over the lifetime of the investment is what they usually expect (Goldberg, R. T., 2012)[28].

[24] Venture Capital Funds Definition (investopedia.com)
[25] Hellmann, T., Puri M. (2002). *Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence.* The Journal of Finance, 57.1, pp. 169–197.
[26] Fairchild, R. (2011). *An entrepreneur's choice of venture capitalist or angel-financing: A behavioral game-theoretic approach.* Journal of Business Venturing 26.3, pp. 359–374.
[27] Van Osnabrugge, M. (2000). *A comparison of business angel and venture capitalist investment procedures: An agency theory-based analysis.* Venture capital 2.2, pp. 91–109.
[28] Goldberg, R. T. (2012). *An Introduction to Startup Financing and a New Approach to Attracting Capital Resources.* StartupFactory LLC.

1.7 Incubators

Another entity that operates in the field of investment in start-ups is the business incubator, whose role, however, is somewhat different from that of business angels and venture capitalists. They are organizations that aim to support the growth process of the start-up and ensure its future survival through a collaboration limited in time to a few years (Peters, L., Rice, M., Sundararajan, M., 2004)[29]. Two macro-typologies of business incubators can be distinguished depending on their attitude towards profits (Grimaldi, R., Grandi, A., 2005)[30] (**Table 1**):

- Profit-oriented: this type of incubator, predominantly privately-owned, equates to Venture capital funds in that they provide resources and support for financial gain by obtaining equity stakes or a simple fee as remuneration. Typical examples of profit-oriented incubators are the CBI (Corporate Business Incubators), set up by large companies, and the IPIs (Independent Private Incubators), run by individuals or small collectives;
- Non-profit-oriented: they are typically public and, unlike the former, are not interested in profit since they rely on external financing. Examples of non-profit-oriented incubators are the UBIs (University Business Incubators) and BICs (Business Innovation Centers).

	AFFILIATED	INDIPENDENT
PROFIT-ORIENTED	CBI	IPI
NON-PROFIT	UBI	BIC

Table 1: types of incubators (Source: Grimaldi, R., Grandi, A., 2005). The table is the one structured by the author but translated into English.

A further classification presented in the literature is based on the social commitment of the companies sustained by the incubators, meaning the positive impact they have on society's development and well-being (Sansone G. et al., 2020)[31]. Thus, three types of business incubators are identified:

[29] Peters, L., Rice, M., Sundararajan, M. (2004). *The Role of Incubators in the Entrepreneurial Process.* The Journal of Technology Transfer 29.1, pp. 83–91
[30] Grimaldi, R., Grandi, A. (2005). *Business incubators and new venture creation: an assessment of incubating models.* Technovation 25.2, pp. 111–121.
[31] Sansone, G., Andreotti, P., Colombelli, A., Landoni, P. (2020). *Are social incubators different from other incubators? Evidence from Italy.* Technological Forecasting and Social Change 158, pp. 120– 132.

- Business: they are not interested in social issues and do not fund any start-ups involved in this environment.
- Mixed: they support at least one start-up with social aims, but no more than fifty percent of the incubated companies.
- Social: they guarantee their resources mainly to companies operating in the social field, which represent more than half of their investment portfolio

Incubators operate at the beginning of the start-up's life cycle, when the idea is still in its infancy, and aid with the many tasks required for the company's growth, such as the drafting of a business plan (Aernoudt, R., 2004)[32]. These organizations' assistance services can be divided into three broad categories:

- Material: in addition to receiving money, start-ups can now operate for low or no cost in infrastructures that would not otherwise be economically viable, thus being able to achieve major development and production objectives.
- Intangible: from the standpoint of the intangible component, administrative and fiscal consultancy is especially useful, without which start-ups would otherwise be forced to turn to costly consultants.
- Networking: founders can interact with and join a large network of highly qualified and competent people through business incubators, such as managers of other firms supported by the incubator or other collaborators who are specialists in the sector. Access to the network also provides a reputational benefit, increasing the value and visibility of the start-up to investors.

Since the early 2000s, a new sort of incubator, known as business accelerators, has evolved. These differ from traditional business incubators (**Table 2**) as they take a different approach with the start-ups they support, collaborating for a shorter period of time, usually three to six months, but interacting more frequently (Pauwels, C. et al., 2016)[33]. Another difference is that accelerators operate at a later stage than incubators, necessitating the presentation of a first MVP even during the selection round (Isabelle, D. A., 2013)[34]. These companies are typically profit-driven, and given the brevity of the partnership with start-ups, they focus on sectors with a short time-to-market in order to achieve tangible results rapidly (Isabelle, D. A., 2013)[35].

[32] Aernoudt, R. (2004). *Incubators: Tool for Entrepreneurship?.* Small Business Economics 23.2, pp. 127–135.
[33] Pauwels, C., Clarysse, B., wright, M., Van Hove, J. (2016). *Understanding a new generation incubation model: The accelerator.* Technovation 50-51, pp. 13–24.
[34] Isabelle, D. A. (2013). *Key Factors Affecting a Technology Entrepreneur's Choice of Incubator or Accelerator.* Technology Innovation Management Review, pp. 16–22.
[35] Isabelle, D. A. (2013). *Key Factors Affecting a Technology Entrepreneur's Choice of Incubator or Accelerator.* Technology Innovation Management Review, pp. 16–22.

	INCUBATORS	ACCELERATORS
DURATION OF THE COLLABORATION	A FEW YEARS	A FEW MONTHS
START OF THE COLLABORATION	AFTER IDEA'S PRESENTATION	AFTER FIRST MVP
FREQUENCY OF THE INTERACTION	LOW	CONTINOUS
TIME TO MARKET	HIGH	LOW
ECONOMIC INTERESTS	ALSO NON-PROFIT	GENERALLY PROFIT-ORIENTED

Table 2: main differences between incubators and accelerators (Source: Isabelle, D. A., 2013). The table has been created on the basis of the article's content.

1.8 Exit ways for start-ups

As mentioned before, for start-ups that have structured and well-functioning business models the last stage is exit. The term exit refers to the moment when a significant change in the ownership structure of the company happens. There are several ways to exit for a late-stage start-up. The most known are IPOs and M&As[36]. These ways can be described as follows:

1. IPOs: IPO stands for initial public offering and with it, a start-up starts selling its shares on the public equity markets. Generally, a company relies on one or more investment banks to file for an IPO and this bank (or these banks) takes the name of underwriter. The underwriter is in charge of setting up the offering price of company shares and selling these shares to a pool of selected investors, with whom it usually has a relationship. Setting the offering price is a crucial step for any IPO, and for this reason, the underwriter performs a financial valuation of the company. To do this, several valuation methodologies can be used, but the most applied are the DCF and Multiple methodologies. After the IPO, the shares are traded on the stock exchange market chosen by the company in accordance with the underwriter. The reasons why a company might decide to go public are basically three: to raise funding, in fact, this way of exit is used when for a start-up raising capital from venture capitalists and private equity funds is no longer a feasible option; to achieve liquidity and to enhance visibility and

[36] Mergers and Acquisitions.

reputation. Going public is quite expensive for a company, since it implies new costs related to legal matters, accounting and informative duties and to the IPO process itself. A common phenomenon related to IPOs is the “first-day under-pricing". In particular, on average stock price jumps on the first day of trading. As a result of that, issuing companies leave substantial value on the table, since they could have raised more capital with a higher offering price at IPO. This has become a common pattern across the most developed capital markets over time. Among the possible explanations of this phenomenon there are: the herd instinct, according to which less sophisticated investors follow more sophisticated ones once the IPO succeeds, pushing up the stock price, and the so-called “IPO spinning”, according to which investment banks use under-priced IPO allocations to attract and reward high value clients.

2. M&As: mergers and acquisitions are other important ways to exit for a late-stage start-up. Mergers happen when a similar or larger company is looking for complementary skills on the market or because it wants to save time, so instead of developing a new product or service from scratch, it merges with a late-stage start-up. Acquisitions are mainly due to the same reasons, what is different is that the existing start-up stays an independent company. Another form of acquisition is the so-called “acquihires” that basically refers to acquisition plus hiring. This form of acquisition is driven by the willingness of the acquirer of having the team of the target start-up rather than its product or service.

1.9 Exit trends for start-ups

After 2000 three significant trends have been recognized regarding start-ups' exits. The first trend refers to the number of IPOs which has recorded a significant drop after 2000. In fact, from 2000 to May 2022 (**Figure 3**), excluding 2020 and 2021, there has been on average a decrease in the number of IPOs. This can be explained by several reasons. First of all, as mentioned before, going public is costly for companies since they face increasing costs. Secondly, receiving funding has become less central for young companies especially in the first stages, because thanks to the new technologies the cost of launching new internet businesses has dropped. In fact, more than funding, start-ups need help and advice regarding how to develop managerial skills, the new product or service, and how to build and enlarge their network. For this reason, business incubators and accelerators together with business angles, that on top of providing companies with funding help young companies face their first challenges, have started playing a more and more significant role in the start-up's growth, making start-ups postpone Series A rounds. As a consequence of that, a more founder-friendly environment has emerged that has helped start-ups stay private longer, since funding has not been an issue for start-ups having less need for money (in the first stages) and more alternatives to receive funding. The second

trend is the rapid growth in the number of the so-called "unicorns", which are privately held start-up companies with a valuation of over $1 billion (Hirst, S., Kastiel, K., 2019)[37]. In fact, as companies have the chance to stay private longer, they are able to grow and achieve very high valuation even without tapping public equity markets. The last trend is related to the larger fraction of Venture Capitalist backed start-ups that have exited via acquisitions. The preference for acquisitions rather than IPOs can be partially explained by the same reasons of the decrease in the IPOs number but also by the more attractive terms offered by the M&As market.

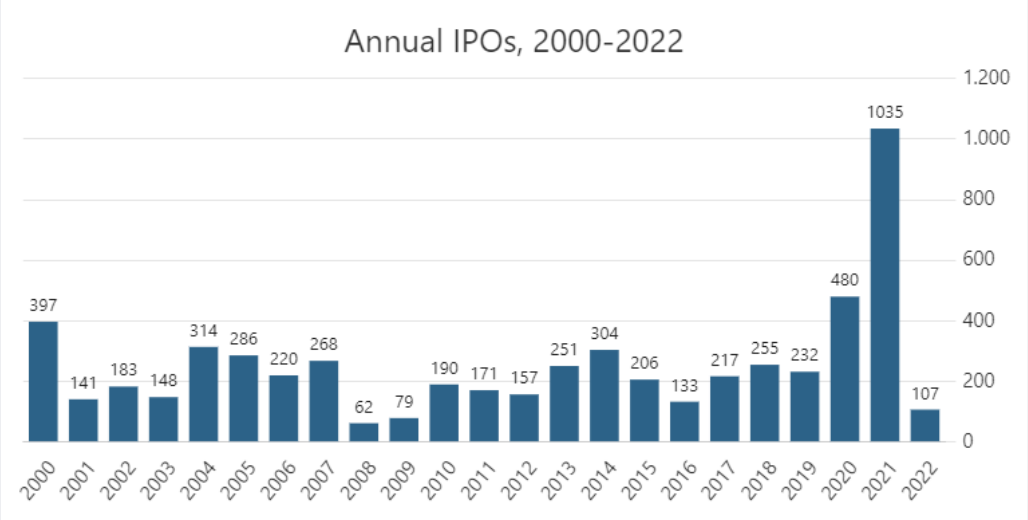

Figure 3: annual IPOs from 2000 to 2022 (Source: https://stockanalysis.com/ipos/statistics/).

[37] Hirst, S., Kastiel, K. (2019). *Corporate Governance by Index Exclusion.* Boston University Law Review.

2. Valuation methodologies

2.1 Start-ups' valuation

After having analysed the main characteristics of start-ups and having understood the uniqueness of this kind of company, it is time to move onto their valuation. Generally, when a company valuation is performed the useful information is taken out from three sources (Sivitska, Y. ,2018)[38]:

1. the company's current financial statement.
2. the company's financial history, commonly summarized in its financial statement.
3. the industry and comparable company data

However, when it comes to start-ups, these sources are not extremely useful because the amount of information is very small. In fact, in most cases, there could be a complete lack of information since start-ups in early stage do not have financial history and if they do, it is very little. Furthermore, also in terms of industry and comparable firm data, it might be very complicated to gather information since start-ups adopt new business models making it harder to find the right competitors and comparable firms. When evaluating a start-up, it is crucial to analyse not the project's current financial condition, but its future status, taking into consideration all the risks involved in this venture (Sivitska Y., 2018)[39]. To better assess the value of a start-up, three factors must be considered (Montani, D., Gervasio, D., Pulcini, A., 2020)[40]:

1. paying attention to future forecasts rather than past data.
2. using probability to consider different scenarios.
3. understanding and paying attention to the start-up's specific business model rather than data on comparable companies in the market.

[38] Sivitska, Y. (2018). *Features of valuation of startup companies.* Consulting "Forex".
[39] Sivitska, Y. (2018). *Features of valuation of startup companies.* Consulting "Forex".
[40] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.

2.2 Traditional valuation methodologies

2.2.1 DCF method

According to the Discount Cash Flow (DCF) method, the value of a company depends on its prospective ability to generate stable operating cash flows (free cash flow), which offer a reasonable return on invested capital. In fact, according to the financial methodology, the value of the economic capital of a company is equal to the value of the cash flows that it is expected to be able to generate, discounted using a discount rate that reflects the operating-financial risk profile of the investment.

Measuring any asset using a financial approach cannot disregard a precise estimate of the cash flows and the discount rate used to discount these flows. The formula used in the DCF method is the following:

$$EV = \sum_{i=0}^{n} \frac{FCFO_i}{(1+r)^i}$$

Where:

EV = enterprise value

$FCFO_i$ = cash flow at the time i

r = disocunt rate

n = number of periods

This valuation method can be applied following the asset side approach or the equity side approach. The asset side approach provides a determination of the overall gross value of the firm (enterprise value) through the discounting of the future cash flows from the total invested capital, both debt and equity. The equity side executes a direct determination of the economic value attributable solely to the equity (equity value) by discounting projected cash flows available to individuals who have invested in the company through equity. The cash flows to be discounted in the asset side approach include only those generated by operations, excluding any financial expenses. These cash flows, referred to as unlevered cash flow or free cash flow from operations (FCFO), are available to the firm to remunerate the total capital invested, regardless of the source, whether it is capital or cash. For computing the enterprise value, the free cash flows from operations must be

discounted at the weighted average cost of capital (WACC) which contains information regarding the operational and financial risk profile of the organization. Through the subtraction from the enterprise value the current value of the net financial position the value of equity is obtained. In the equity side approach, prospective cash flows are net of financial management (levered cash flow or free cash flow to equity, FCFE) and represent the financial resources available to remunerate solely the equity. Equity value is obtained by discounting cash flows at the expected rate of return for those who have invested in equity. The discount rate represents the cost of equity calculated, most often, through the Capital Asset Pricing Model (CAPM). These are the two formulas to compute the enterprise value using the equity and the asset side approaches:

Asset side: $EV = \sum_{i=1}^{n} \frac{FCFO_i}{(1+WACC)^i}$

Equity side: $Equity\ Value = \sum_{i=1}^{n} \frac{FCFE_i}{(1+K_e)^i}\ W_E = \sum_{i=1}^{n} \frac{FCFE_i}{(1+Ke)^i}$

Where:

W_A = enterprise value

$FCFO_i$ = free cash flow from operations in year i

$FCFE_i$ = free cash flow to equity in year i

WACC = weighted average cost of capital

Ke = cost of equity

i = the yaer which is considered

n = the last year to be considered

These two values are linked by the following formula:

$$EV = Equity\ value + NFP$$

Where:

EV = enterprise value

NFP = Net financial position

How to compute FCFO (**Table 3**) and FCFE (**Table 4**):

FCFO =
NOPAT
+ DEPRECIATION
- Δ NWC
- CAPEX

Table 3: computation of FCFO.

Where:

NOPAT = NET OPERATING PROFIT AFTER TAXES

Δ NWC = NET WORKING CAPITAL VARIATION

CAPEX = CAPITAL EXPENDITURE

FCFE =
FCFF
- (1 - t) × INTEREST PAYMENTS
+ NET BORROWING

Table 4: computation of FCFE.

Where:

t = company tax rate

Once the free cash flows have been determined, they have to be discounted at a specific rate. In the asset side approach, the rate used to discount the free cash flows to firm is the weighted average cost of capital (WACC), which is computed as the weighted average of the cost of debt (K_d) and the cost of equity or cost of capital (K_e)[41]. The cost of debt is the remuneration for those who provide funds through debt whereas the cost of equity is the remuneration for those who finance the company through equity. In the equity side approach, the free cash flows to equity have to be discounted at the cost of capital. The cost of capital (K_e) is generally computed through the use of the Capital asset pricing model (CAPM)[42]. When using the DCF method analysts

[41] the formula for the weighted average cost of capital is the following: $WACC = \frac{Debt}{(Debt+Equity)} \times K_d + \frac{Equity}{(Debt+Equity)} \times K_e$

[42] According to the CAPM: $K_e = R_f + \beta \times (R_m - R_f)$

Where: R_f = risk free rate; β = a measure of the systematic risk of a security or portfolio compared to the market as whole; R_m =the return on the overall market; $R_m - R_f$ = market risk premium

typically define a time horizon along which they determine the several free cash flows; usually, the time horizon ranges from 3 to 10 years. However, since the company is expected to operate also beyond the chosen time horizon, in order to obtain the value of the company it is necessary to take into account also the free cash flow the firm will be generating after the time horizon considered. For this reason, a terminal value is computed (TV). The terminal value takes into consideration the infinite free cash flows the company will be able to generate after the given time horizon. The terminal value can be computed in two ways, depending on the presence or not of growth. If the company is expected to grow steadily in the future the formula for the terminal value is the following:

$$TV = FCF_n \times \frac{(1+g)}{(r-g)}$$

Where:

n= the last year of the given time horizon

g= growth rate

r= the rate used to discount the FCFs, which can be the WACC or the cost of capital

If for the company no changes are expected, the terminal value is computed as follows:

$$TV = \frac{FCF_n}{r}$$

It is important to notice that the terminal value gives a value of the firm in the last year of the considered time horizon.

At this point the formula for determining the enterprise value with the DCF can be written as follows:

$$EV = \sum_{i=1}^{n} \frac{FCFO_i}{(1+r)^i} + \frac{TV}{(1+r)^n}$$

Where:

$EV =$ enterprise value

$FCFO_i =$ free cash flow from operations in year i

$n =$ number of years in the time horizon

$r =$ disocunt rate

2.2.2 APV method

Adjusted Present Value (APV) is a variant of DCF which is particularly suited to the valuation of operations characterized by a large recourse to debt and by a structure debt and a financial structure which varies from year to year; the typical case is represented by leveraged buyout operations. The APV provides for the separate and analytical valuation of the tax benefits of the debt (tax shields), linked to the deductibility of interests payable. In the DCF method, on the other hand, as seen above, the tax benefits of the debt are implicitly included in the WACC formula. However, if the financial structure changes significantly from one year to the next, a correct and rigorous application of the DCF would necessitate an estimation of a different WACC for each year; to overcome this criticality, it is therefore possible to use the separate valuation of the debt's tax benefits. The enterprise value is given by the sum of two values: the unlevered enterprise value, calculated by discounting FCFOs not at the WACC but at an unlevered rate, which does not take into account the financial management, but only the operating management, as if it was a non-levered company, and the current value of the tax shields.

General formula of the APV:

$$EV = \sum_{i=1}^{n}\left[\left[\frac{FCFO_i}{(1+Keu)^i}\right] + \left[\frac{TV_{unlevered}}{(1+Keu)^n}\right]\right] + \sum_{i=1}^{n}\left[\frac{(D_i \times K_d \times t)}{(1+Ks)^i} + \frac{TV_{TS}}{(1+K_{TS})^n}\right]$$

Where:

$FCFO_i$ = free cash flow to firm in year i

Keu = cost of equity (unlevered)

K_d = cost of debt

K_{TS} = discount rate of tax shields

$TV_{unlevered}$ = terminal value net of tax shields

TV_{TS} = terminal value of tax shields

D_i = debt in year I

t = company tax rate

The cost of equity of a firm is computed by summing the cost of equity of the non-debt firm and the cost of debt, then subtracting the percentage of untaxed income multiplied by the debt-to-equity ratio. The APV technique has the advantage of showing how different financial structures and financing instruments affect the business in terms of value by assessing the tax benefits of debt individually. However, a significant implicit weakness in this variation of the DCF is that it presupposes perfect knowledge of the debt amortization strategy.

2.2.3 Multiples method

It is a method based on the equality of the value of economic capital and the product of a market or income multiplier and a quantity expressing the economic value of the company's capital. The multiples method can be separated into two categories based on the equity approach to valuation and the entity approach to valuation criteria. The first approach is a direct and instantaneous assessment of the value of the equity, whereas the second is an indirect estimate based on the difference between the business value and the market value of the financial debts. In practice, the two approaches entail that it is possible to discriminate between two categories: equity side and asset side. The distinction is solely determined by the value specified in the multiple's numerator. The numerator in the first example (equity side) is the stock market price of the shares or the "stock market capitalization," which is the current value of the equity; these are known as equity multiples. The numerator in the second scenario (asset side) is the investment in gross assets, which is typically defined as the sum of market capitalization and net financial debt. In this second example, the numerator is denoted by the sign EV (Enterprise Value). These multiples are known as enterprise value multiples. The multiples can be distinguished by the quantities expressed in the denominator. These are essentially either performance measures, meaning periodic results, or other values, either accounting-related or not. If the denominator refers to performance, the assumed periodic results must be compatible with the numerator. This means that the outcomes (net profits or operational margins) should be intended after interest charges (levered) for the equity multiples whereas for asset-side multiples "before" interest expenditure (unlevered). Thus, the methodology operates by constructing a series of relationships between the actual prices of comparable companies' securities and certain accounting elements in order to identify the relationship that links the value of the companies to specific company variables identified as the company's value drivers. In particular, the process entails determining a company's value by multiplying some of its balance sheet values, such as, in general:

- Net earnings
- Book value
- Earnings before interest, taxes, depreciation and amortization (EBITDA)

- Earnings before interest and taxes (EBIT)

Equity side multiples are typically recommended: in industries with consolidated profitability, where the gap between current balance sheet profitability and actual economic results is small and in high-growth industries, in the form of forward multiples or second-tier multiples, such as the PEG (P/E-to-growth) multiple. The P/E is the most well-known of the equity side multiples. It measures performance using net income. Asset-side multiples allow for greater flexibility and more accurate comparisons. The P/EBITDA ratio is one of the most utilized because it is almost never negative and therefore can be calculated for a larger number of companies. Furthermore, it is unaffected by balance-sheet policies, can be compared across enterprises with varying capital and debt intensity, and is an effective indicator of financial payback.

2.3 Alternative methods for start-ups' valuation

While the methodologies previously explained are the most used when it comes to traditional companies' valuation, they do not really work for start-ups. The main issue related to the use of these methods for start-ups is the information needed to correctly and effectively apply them. When adopting the DCF method (and its variant, the APV method) to value start-ups there are several issues to be considered. Firstly, for start-ups the computation of the terminal value is of paramount importance because it can represent more than 4/5 of the total value of the company but its definition gets extremely complicated since it is impossible to coherently define the following elements: if, when and how the start-up will grow (Montani, D., Gervasio, D., Pulcini, A., 2020)[43]. Secondly, defining the discount rate for young companies is complicated. In fact, the adequateness of traditional models, such as CAPM, is very limited since with these methodologies the company's historical background and the features of the sector are considered in the determination of the discount rate but for start-ups extrapolating back past returns and getting the beta of the firm is impossible and very frequently they have characteristics significantly differing from those of other companies in the same sector (Montani, D., Gervasio, D., Pulcini, A., 2020)[44]. Furthermore, typical ways to calculating the discount rate focus on market risk, whereas the major risk for start-ups is firm-specific risk (Steffens, P., Douglas, E., 2007)[45]. This technique is difficult to adopt with newly formed companies because multiples are typically dependent on earnings or revenues, which are sometimes negative in start-ups as they normally record losses instead of profits, and at

[43] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.
[44] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.
[45] Steffens, P., Douglas, E. (2007). *Valuing technology investments: use real options thinking but forget real options valuation.* International Journal of Technoentrepreneurship, 1(1), 58-77.

the beginning revenues are very low. Furthermore, it is nearly impossible to find comparable data in the market because each organization has unique and non-replicable characteristics and finding data about young companies on the market is harder than finding data for mature companies (Montani, D., Gervasio, D., Pulcini, A., 2020)[46]. For these reasons, alternative methodologies for valuing start-ups have been created.

2.3.1 The venture capital method

This valuation method is typically applied to highly innovative enterprises with little or no track record and extremely high risk and return expectations. It is a version of the DCF method since it is based on calculating the cash flow at a future date, which usually coincides with the time when the venture capitalist will sell the share, completing the planned exit. This method focuses on the final value that the company will be able to achieve at the time of disinvestment as well as on the investor's expected return. The proposed technique starts from the consideration of the peculiarity of the type of investment in recently established enterprises, which are characterized by negative economic results and cash flows, as well as a high degree of risk. According to this method, the presumed cash flow is computed at a later period, often coinciding with the time horizon required to be reasonably certain that the project has already begun to create positive cash flows. At this point, the company's future value is determined using appropriate market multiples, which are widely used in business valuation techniques. The final value estimated in this manner is discounted at a rate ranging from 25% to 60%, depending on the risk involved with the investment. The determination of the final discounted value then allows investors to calculate the equity stake that can be acquired on the basis of the expected returns. In particular, this methodology is developed through 4 phases:

1. Estimate of the enterprise value at a future date, typically at the time of the expected sale of the investment: the final value, defined as exit value is calculated on the basis of the income that is estimated to be generated with the initiative after a certain number of years and using a market multiple.
2. Discounting of exit value. The discounting of the final value requires a discount rate that expresses the return that the venture capitalist expects to obtain (in terms of IRR - Internal Rate of Return) taking into account the risk and resources invested. The rates of return at which the flows are discounted in the venture capital activity vary between 25% and 60% per year. The formula for calculating the discounted exit value is:

Present value of exit value $= \frac{(Exit\ value)}{(1+IRR_t)^n}$

[46] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.

Where:

IRR_t = target internal rate of return

n = the number of years between investment and disinvestment

The valuation that emerges represents the total value of the company at the moment of the venture capitalist's entry.

3. Computation of the desired exit equity stake. The venture capitalist uses the final discounted value and the amount of the proposed investment to also calculate the desired exit equity stake. It is computed by dividing the investment made by the venture capitalist and the present value of the exit value, as shown in the formula below:

Exit stake = investment / present value of exit value

4. Estimate of the dilution effect and computation of the entry stake required by the venture capitalist. The previous equation would be the correct answer in the absence of subsequent funding rounds that result in dilution of the venture capitalist's equity stake. To compensate for the dilution effect of future capitalisations, the retention ratio must be calculated. For instance, let's take into consideration a company that plans to execute two more funding rounds that will lead to the sale of 20% and 25% of the company respectively. If the first venture capitalist owns an equity stake of 20% after these 2 more round his diluted equity stake will be equal to 20% * (1 – 20% - 25%) which equals 11%. The second term of the product is the retention rate, computed as 1 - sum of exit stakes of future investors, and it is extremely important to redefine the entry stake the first venture capitalist will have to ask for taking into account the dilution effect. In fact, the entry equity stake with multiple rounds is computed as in the following formula:

Entry stake = exit stake / retention rate

The main criticism of the Venture Capital Method concerns the use of very high discount rates. Venture capitalists justify the use of such high rates based on several considerations:

- the need to compensate for the low liquidity of the investment (illiquidity risk).
- the fact that VCs are active investors that on top of funds bring in: expertise, experience and networks.
- the need to compensate for the probability that the company will not survive.

In this regard, it should be noted that the chance of the company failing to survive during the period of venture capitalist investment is far from insignificant. This risk is significantly bigger than other categories of business risk, and as a result, a very high return is required to justify taking it on. Because investment analyses are not generally needed to cope with such high probability of firm failure, except in circumstances of turnaround, and hence of entire loss of invested capital, the high level of remuneration required to cover this risk frequently

surprises the founders. For this reason, some operators in the sector, while acknowledging the validity of the thesis of the Venture Capital Method, consider the discount rate to be overestimated since the implicit premium required for the risk of zeroing out the investment and the lack of liquidity would be too high. From these considerations over time other empirical methodologies, that make certain adjustments with the aim of reaching the objective of reaching more acceptable values, have been developed.

2.3.2 First Chicago method

Another empirical methodology is the valuation method created by First Chicago Corporation that evolved from the Venture Capital Method. This technique differs from the previous one in that it employs lower discount rates and replaces the final value with the expected value of the investment, which is an average of the company's terminal value under three different scenarios. Three alternative scenarios are generally assumed (Catty, J.P., 2008). [47]:

- a first "optimistic" scenario with a sustained sales forecast, called “Success scenario”
- a second "realistic" scenario characterized by a more contained development trend, called “Survival scenario”
- a third "pessimistic" scenario that essentially coincides with the hypothesis of failure of the initiative, called “Failure scenario”

This method offers a more conservative estimation approach, as it additionally takes into account a negative assumption, which contributes to a lower final result. Furthermore, in the event of a distribution of the operating result, it discounts all positive flows that the venture capital may have achieved over the investment period. As a result, the computation to establish the share of capital (Q) that the Venture Capitalist must request in exchange for the investment is (Cioli, V., 2010)[48]:

Q = (Investment – Future cash flow value outside the IPO) / Expected future value

Unlike the previous approach, this one assumes the existence of positive cash flows between the time of investment and the moment of share sale. Furthermore, the hypothesis of the various scenarios takes into account at least three potential paths of development that result in the expected value. All this leads to this

[47] Catty, J.P. (2008). *The First Chicago Method.* Corporate Valuation Ltd.
[48] Cioli, V. (2010). *Modelli di business e creazione di valore nella New Economy.* Franco Angeli.

methodology being more prudent and closer to a realistic estimation of the share's true value. However, it also suffers from the same problems mentioned for the Venture Capital Method model.

2.3.3 Real options method

This approach has the potential of improving the component associated with flexibility and managerial discretion when making specific strategic decisions (Trigeorgis, L., 1999)[49]. Analysts believe it is appropriate to assess not just the equity components and predicted cash flows, but also the strategy pursued and management's capability to manage business development and change dynamically. Management discretion in business governance always has a monetary value that must be recognized. Given that the options presented to management can be compared to financial options[50] of the call or put type, theorists established the idea of real options, which is linked to real and non-financial investments. These theories were developed in the early 1980s as a method of evaluating investment projects with high complexity and uncertainty, for which traditional tools proved ineffective. The idea of real options, in particular, seeks to assess an investment project, as well as a company, on the basis of future opportunities associated to specific strategic choices. This approach, however, has drawbacks linked to computational issues and processing difficulty. With this method the value of a firm is perceived as a sort of right to receive future cash flows, when and if they are generated. The value of the company is shown as a portfolio of call options. In particular, real options present a broader case history than financial options and among the strategic choices available to management it is possible to find:

- Growth options aimed at developing the size of the business.
- Flexibility options aimed at increasing the firm's ability to respond to market changes.
- Deferral options to postpone a project if future returns are predicted to be higher, or to abandon a project if the liquidation value of a project is higher than the expected cash flows.

[49] Trigeorgis, L. (1999). *Real Options: Managerial Flexibility and Strategy in Resource Allocation.* The MIT Press.
[50] an options contract grants the right but not the obligation to buy or sell an underlying asset at a set price on or before a certain date. A call option gives the holder the right to buy a stock and a put option gives the holder the right to sell a stock.

For this reason and since this method, however, relies heavily on uncertain estimates and often far from the market fundamentals especially in cases of companies belonging to the so-called new economy, there have been cases of overvaluation (Damodaran, A., 2013)[51].

2.3.4 The "Rule of thirds" (RoT)

Business angels often use this methodology to quickly come up with a valuation for start-ups (Montani, D., Gervasio, D., Pulcini, A., 2020)[52]. It is deemed to be more of a valuation screen than a proper valuation model, owing to its simplicity and arbitrariness (Mothersill et al., 2009)[53]. According to empirical evidence, each start-up has three parties: the founders who originated the business idea and contribute part of the equity, the external investors who provide part of the equity, and the managers who oversee the business and often receive shares through stock option plans. Based on this evidence and assuming that each segment has one-third of total capital, the result is the RoT, which states that the post-money value of a start-up equals the triple of the equity granted by the investor during each funding round.

2.3.5 The Berkus Method

When investing in start-ups during the early stage the considerations do not only relate to the product, but also other qualitative parameters are considered such as the team, scalability, replicability etc. A widely used evaluation method is the Berkus Method which takes its name from its creator. It has a fairly simple structure: depending on the size of the reference market, a value is assigned to each of these 5 items (**Table 5**) (typically ranging from 0 to 500,000 €):

1. Sound idea
2. Prototype
3. Quality management team
4. Strategic relationships
5. Product rollout or sales

[51] Damodaran, A. (2013). *Real options: Fact and Fantasy.* Retrieved from: https://pages.stern.nyu.edu/~adamodar/pdfiles/eqnotes/packet3pg2spr13.pdf.
[52] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.
[53] Mothersill, W.D., Watson, B., Fast, F., Gedeon, S. (2009). *Age Of The Angel: Best Practices For Angel Groups.* National Angel Organization, Canada.

In the event that a start-up fully meets all items it will have a pre-money valuation of €2.5 million. This means that the investor has attempted to mitigate all the risks associated with the investment. Although this method is quite effective, the results must be validated and supported by at least another method. Once the start-up has been assigned a value, the percentage of capital to be given to the investors can be calculated, clearly based on how much capital they provide.

% Equity = Investment / Pre-money valuation

IF EXISTS	ADD TO COMPANY VALUE UP TO
SOUND IDEA (BASIC VALUE)	500,000€
PROTOTYPE (REDUCING TECHNOLOGY RISK)	500,000€
QUALITY MANAGEMENT TEAM (REDUCING EXECUTION RISK)	500,000€
STRATEGIC RELATIONSHIPS (REDUCING MARKET RISK)	500,000€
PRODUCT ROLLOUT OR SALES (REDUCING PRODUCTION RISK)	500,000€

Table 5: valuation of risk factors according to the Berkus Method. (Source: Berkus, D., 2016)[54].

2.3.6 Scorecard method

The creator of this methodology is a business angel named Bill Payne and it is adequate for valuing start-ups in a pre-revenue stage (Montani, D., Gervasio, D., Pulcini, A., 2020)[55]. With this method it is possible to assess the value of start-up by making comparisons with other young companies recently funded in the same geographical area. Specifically, a pre-money valuation of the start-up under assessment is obtained by correcting the average value estimate of comparable firms that are in the same lifecycle. The Scorecard method is articulated in two phases. The former is to compute the average pre-money valuation of pre-revenue companies that operate in in the same geographical area and in the same business sector. The latter is about using some specific variables, to which different weights are assigned (**Table 6**) to make the comparison between the start-up under analysis and the comparable companies. A final value to the start-up considered is then given by the product of sum factors and the average start-ups' value. The key to the Scorecard method, also referred to as the Bill Payne method or Benchmark method, is a good understanding of the average (and

[54] Berkus, D. (2016). *After 20 years: Updating the Berkus Method of valuation.* Berkonomics. Retrieved from https://berkonomics.com/?p=2752
[55] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.

range) of companies' pre-money valuation. With these variables, the Scorecard method provides subjective techniques for adjusting the valuation of a target company. The Scorecard Method, like the Berkus Method, focuses on critical areas in determining the value of a business, such as team management abilities. However, this method has certain flaws, such as the high degree of discretion utilized to assign a weight to the many criteria that define the ultimate start-up value.

FACTORS	RELATIVE WEIGHT
STRENGTH OF THE MANAGEMENT TEAM	0-30%
SIZE OF THE OPPORTUNITY (SCALABILITY)	0-25%
PRODUCT/TECHNOLOGY	0-15%
COMPETITIVE ENVIRONMENT	0-10%
MARKETING/SALES CHANNELS/ PARTNERSHIPS	0-10%
NEED FOR ADDITIONAL INVESTMENT	0-5%
OTHER	0-5%

Table 6: valuations of variables according to the Scorecard Method. (Source: Payne, B., 2011)[56].

2.3.7 Risk factor summation method

If compared to the Scorecard and Berkus methods, the risk factor summation method (RFSM) takes into account a broader set of factors relevant for determining the value of a firm in its pre-revenue stage (Kowlessar, F. A., 2016)[57]. The RFSM comprises many external risk factors that a corporation must manage in order to profit from the investment. First of all, as in the Scorecard method, it is necessary to assess the average pre-money valuation of pre-revenue companies that operate in in the same geographical area and in the same business sector. Secondly, it is needed to assign to the possible risks, listed by this method and associated with start-ups and their sectors, a different rating the "correct" average pre-money valuation for comparable companies will be based on (**Table 7**) (Karius, T., 2016)[58].

[56] Payne, B. (2011). *Scorecard Valuation Methodology. Establishing the Valuation of Prerevenue, Startup Companies.* Retrieved from https://www.semanticscholar.org/paper/SCORECARD-VALUATION-METHODOLOGY-Establishing-theof Payne/e97709f963bf19d548d9e7dc8fdb30610717dae6.
[57] Kowlessar, F. A. (2016). *The Berkus & Risk Factor Summation Pre-Money Valuation Methods Explained.* Retrieved from https://magazine.startus.cc/berkus-risk-factor-summation-pre-money-valuationmethods-explained.
[58] Karius, T. (2016). *Intellectual property and intangible assets: Alternative valuation and financing approaches for the knowledge economy in Luxembourg.* (No. 3). EIKV-Schriftenreihe zum Wissens-und Wertemanagement. Retrieved from http://hdl.handle.net/10419/126183.

RATING	MEANING	AVERAGE PRE-MONEY VALUATION ADJUSTMENT
2	VERY POSITIVE TO GROW THE BUSINESS AND GET AN IDEAL EXIT	+ 500,000€
1	POSITIVE	+ 250,000€
0	NEUTRAL	NO CORRECTION
-1	NEGATIVE	- 250,000€
-2	VERY NEGATIVE TO GROW THE BUSINESS AND GET AN IDEAL EXIT	- 500,000€

Table 7: Risk factor summation: correction of average pre-money valuation for the sector. (Source: Montani, D., Gervasio, D., Pulcini, A., 2020).

The importance of each risk for the start-up must be reflected in the weight assigned to each risk. These are the possible risks (Montani, D., Gervasio, D., Pulcini, A., 2020)[59]:

- Management risk
- Stage of business
- Legislation/political risk
- Manufacturing risk
- Sales and marketing risk
- Funding/capital raising risk
- Competition risk
- Technology risk
- Litigation risk
- Reputation risk
- Potential lucrative exit

The formula to obtain the start-up's value with the RFSM is the following:

Pre-money valuation = average pre-money valuation for the sector +/- adjustment

[59] Montani, D., Gervasio, D., Pulcini, A. (2020). *Startup Company Valuation: The State of Art and Future Trends.* International business research; Vol.13, No 9. Retrieved from: http://ibr.ccsenet.org.

3. Airbnb case

3.1 Company history and overview

Airbnb is an online platform that connects people looking for short-term rents, named guests, and people looking to rent their extra space, called hosts. Airbnb was born in 2007 from the need of two young students of design, Brian Chesky and Joe Gebbia, to pay the rent of their San Francisco apartment. The idea came when it was the time of an international design conference in San Francisco and every hotel was sold out. A website called AirBedandBreakfast.com was created by the two guys to get attendees to the conference to rent airbeds in their apartment and three designers accept their offer and became their first guests. They treated their guests like old friends and made them feel like locals, giving them advice about where to go to live in the city as real locals and not as strangers. After that, the two guys started thinking that there were more people like the three designers who would like to travel this way and more people who would like to host this way. This is the idea Airbnb was founded on. In 2008 Nathan Blecharczyk, an expert in coding, joined the project of Chesky and Gebbia bringing technical skills and expertise and altogether created Airbed & Breakfast. At the very beginning, it was not easy to work on this project, the three founders were about to give up. At a certain point they successfully applied for a spot at YC, a start-up accelerator that in return for a chunk of equity provided them with a small amount of cash, weekly access to YC's founder Paul Graham and his partners, and instructions to YC's network of alumni and friendly investors (Lassiter J. B., Richardson E., 2014)[60]. This was a fundamental step for Airbnb since the founders had the chance to better develop their product thanks to Paul Graham's advice and to have access to new funds coming from YC's network of investors. Over the following years, they were able to make Airbnb grow dramatically; in June 2012 Airbnb counted 10 million bookings and raised 1 billion dollars at a valuation of 30 billion in 2016. As Uber has adopted an innovative business model leading to a disruption in the transportation service industry, Airbnb did the same in the travel industry and for this reason, it has faced various legal issues since it operates at the boundaries of the existing regulation. As it can be noticed in the chart (**Figure 4**) the number of lawsuits has increased as the company was expanding its business and a significant portion of them are about regulation. The chart only relates to the U.S but Airbnb has faced legal issues also in cities of other countries it operates in; in fact, there is a specific regulation for short-term rents in each country, that in some cases doesn't comply with Airbnb's business model.

[60] Lassiter J. B., Richardson E. (2014). *Airbnb*. Harvard Business School.

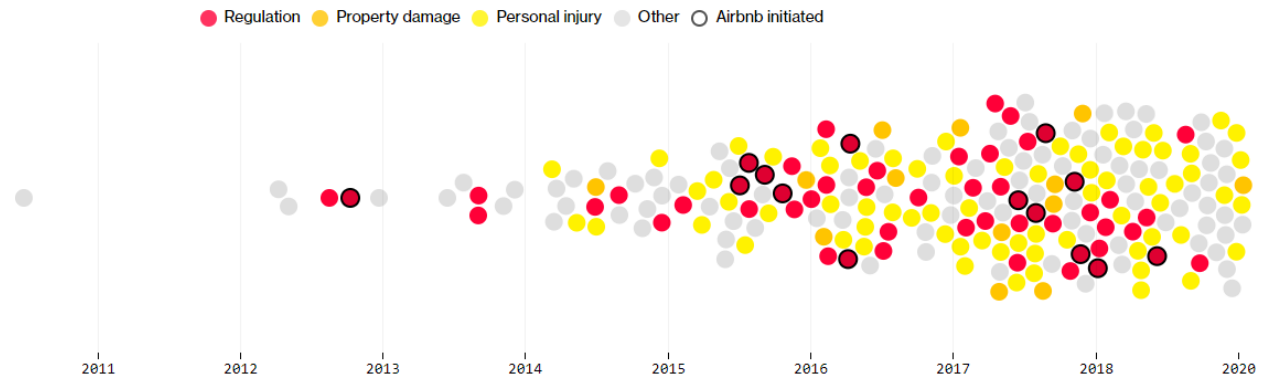

Figure 4: Airbnb's legal challenges over time (Source: Carville, O., Tartar, A., C.F. Lin, J., 2020 [61]).

Over time, as the platform was growing, the rent options offered were not just private rooms but also entire apartments, villas, boats, treehouses, private islands, and other types of accommodation. In 2016 Airbnb launched "Experiences", which are in-person activities organized by local experts that go beyond traditional tours or classes, fully engaging participants in the world of the host, and in 2020 to help hosts make up for lost earnings during the pandemic they also launched "Online experiences". After numerous rumours on the 16th of November 2020, Airbnb filed the prospectus, declaring its aim to go public. In 2021 the company recorded 6 million active listings worldwide, 100 thousand cities and towns with Airbnb active listings, more than 220 countries and regions with its listings, and more than 4 million hosts on its platform[62].

[61]Carville, O., Tartar, A., C.F. Lin, J. (2020). *Airbnb to America's big cities: see you in court.* Retrieved from https://www.bloomberg.com/europe

[62] Airbnb website's Newsroom section. Retrieved from https://news.airbnb.com/about-us/#:~:text=Airbnb%20was%20born%20in%202007,every%20country%20across%20the%20globe.

3.2 Airbnb business model

In this section, the purpose is to analyse Airbnb's business model, by using the Business Model Canvas structure.

3.2.1 Value proposition

As mentioned previously, Airbnb is an online platform that connects two parties: on one side, people who are looking for accommodation for a short-term period (guests) and on the other side, people with extra space to rent (hosts). For this reason, Airbnb can be defined as a two-sided platform that operates as an intermediary between these two parties. Thus, when it comes to value proposition it is possible to distinguish between a value proposition for the hosts and another for guests (Uenlue, M., 2020)[63]. Firstly, Airbnb provides guests with a wide variety of choice since all the accommodations are different from each other and they can choose among private rooms, entire apartments, castles, private islands, and many other kinds of accommodation. Airbnb also provides guests with cheaper accommodation solutions if compared with similar hotel rooms; if not cheaper, Airbnb's solutions are more valuable in terms of price/quality ratio because by offering additional services (kitchen, coffee machine, washing machine, etc.) guests have the chance of saving money during their stay. Finally, thanks to Airbnb guests can have a unique experience and feel more like a local, thanks also to the "Experiences"[64] provided by the platform. On the hosts' side, Airbnb gives them the possibility to generate income from their extra space and this makes the platform truly attractive for them. In addition, Airbnb helps hosts minimize the risks associated with renting for short periods to strangers, such as damage and robbery risks, by providing insurance, setting house rules that need guests' compliance before booking, and several other solutions. Furthermore, Airbnb strives to make it as easiest as possible for hosts to join the platform by providing them with help through the process. Finally, Airbnb puts a lot of effort not only to make it easy for hosts to join the platform but also to manage the reservations providing them with a sort of management system with several features such as: listing details, photos, price setting, availability calendar, and others.

[63] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition

[64] They are in-person or online activities hosted by inspiring local experts that go beyond typical tours or classes by immersing guests in a Host's unique world. https://www.airbnb.com/help/article/1581/an-introduction-to-airbnb-experiences?_set_bev_on_new_domain=1650722658_MTk0MTUzZjRmOTgz&locale=en

3.2.2 Key partners

When it comes to key partners it is clear that hosts represent a crucial partner for Airbnb. In fact, without accommodations Airbnb would be unable to deliver value to guests. Truth to be told, also the opposite is true. Without guests there is no advantage for hosts to join the platform and list their accommodation on it. This is due to the fact that as a two-sided platform, the network effect plays a fundamental role in the success of Airbnb. Thus, the more hosts list their accommodations on the platform the more guests use it to find accommodation and vice-versa, meaning that the more guests use the platform the more hosts join it since they have more chances to make money. This is to say that for the platform itself and its growth both guests and hosts are extremely important but it is clear that in terms of relationship (partnership), hosts are more important since for Airbnb getting the hosts to join the platform takes more time and effort since the process is more structured as it implies more requirements than those needed to use the platform as a guest. For this reason, hosts and not guests are considered key partners for Airbnb. However, it is important to highlight that hosts can have multiple accommodations on competing platforms. Other key partners for Airbnb are tourism partners and communities with which it partners to make platforms more attractive to guests (Uenlue, M., 2020)[65]. Other important partners are technology firms on the non-competitive advantage parts of their technology (Uenlue, M., 2020)[66] such as preferred/additional software partners and other firms that help Airbnb with maps, payment systems, cloud storage, identification, and many other technologies which are also used by other companies operating in the online travel industry. Of course, in the key partners' category, also investors and venture capitalists, as well as commercial partners, must be included.

3.2.3 Key activities

When looking at Airbnb's business model, there are several activities that can be considered extremely important for its business model to work well. First of all, Airbnb needs to achieve and retain consistency (Uenlue, M., 2020)[67]. Achieving consistency means that Airbnb needs to make sure that the service offered by hosts to guests is consistent, meaning that it is justified by its price. This is a very important activity for

[65] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.
[66] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.
[67] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.

Airbnb since the consistency of the service depends on many factors and most of them are not under the direct control of the platform. It becomes even more important since the majority of hosts have no or little experience in hospitality. Once the consistency has been achieved, it is even more important to retain it in order to make repeated customers (from the side of guests) but also and especially to grow the user base and reach new users leveraging the positive network effects. For this reason, Airbnb has created a guide for hosts with useful tips to deliver to guests a unique customer experience. Secondly, because as a two-sided platform Airbnb sees network effects as an extraordinary source of competitive advantage, it is correct to state that another fundamental activity for Airbnb is to grow the network effects (Uenlue, M., 2020)[68]. In fact, to attract more guests it is necessary to attract more hosts and vice versa because this way hosts have more chances to generate revenue from their accommodations, and guests can choose among more accommodation options and pick up the one that best fits their needs. In line with this, Airbnb must focus on the complementary offer besides the accommodation as it did with the launch of the "Experiences" in order to make the platform more interesting and valuable for both sides. Finally, for Airbnb, it is also very important to come up with new solutions and ideas to improve existing value propositions and create new ones (Uenlue, M., 2020)[69]. In fact, for example, Airbnb provided customers with new offering tiers called Airbnb plus (offering high quality and high review score accommodation) and Luxe (offering luxurious accommodation) in order to offer users experiences that are new and more tailored to their needs. Another example of this is the launch of "Online Experiences"[70] after the Covid-19's pandemic breakout, in order to allow guests and hosts to have the same experiences also remotely.

3.2.4 Key resources

Airbnb can be defined as a light asset business since it is a platform, and it does not own the accommodations that are listed on the platform. Thus, among its key assets, it is not possible to include the accommodations themselves. However, the value created by Airbnb still comes from the number, the quality, and the variety of accommodations that are available on the platform for guests. For this reason, one of the key resources for Airbnb is represented by active hosts, who deliver great customer experiences to their guests. As mentioned previously a platform business such as Airbnb in order to be valuable needs to see both sides of the platform as active users, the more active users there are, the greater the value delivered by the platform. Hence, without active guests, the platform itself is useless for hosts and this makes active guests a fundamental resource for

[68] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.
[69] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.
[70] Online experiences are live special events hosted by experts entirely over Zoom, giving online guests the chance to connect with people around the world in small groups for a personal and memorable experience.

Airbnb. All that said certifies the paramount importance for such a business of the network effects. In line with these key resources, it is possible to state that another crucial asset for Airbnb is its brand (Uenlue, M., 2020)[71]. In fact, for such a business trust is a fundamental element; guests need to trust the platform since they are renting their extra space to strangers and guests need to trust Airbnb since they are looking for the best possible solution for their stay and they want to be delivered a service which is justified by the price they pay. For these reasons, Airbnb's brand plays a fundamental role in attracting guests and hosts on the platform that, as said before, are the two most important assets that make the business valuable. A strong brand helps hosts and guests see Airbnb as a trustworthy platform, where offering an accommodation from hosts' point of view and finding one from guests' point of view is a painless process. There are also other key assets for Airbnb: data is another important resource for the platform in order to gather information and deliver a better service; algorithms, technologies, analytics capabilities, and skilled engineers are all valuable resources for an online platform such as Airbnb (Uenlue, M., 2020)[72].

3.2.5 Customer segments

As it can be easily understood from what it has been said regarding Airbnb so far, Airbnb's customers are divided into two categories: guests and hosts. For Airbnb's guests, customer segmentation can be done in several ways. It can be a behavioural segmentation, meaning that customers can be divided into various segments depending on the reasons why they travel and consequently the kind of trip they do such as business travel, leisure travel, a travel to meet family or friends, and so on. The behavioural segmentation also refers to the kind of accommodation guests are looking for and the other people, if present, that are travelling with them; for instance, guests may look for a private room, a shared space, or an entire apartment and they might be accompanied by no one or by a friend, a girlfriend, a colleague and so on. Guests may be segmented also depending on the reason why they prefer to use Airbnb rather than other solutions and on the type of activities they are interested in once on a trip. On the other side, hosts can be segmented by the type of accommodation they provide, which can be a private room, a shared space, an entire apartment, a villa and so on. They can be segmented by the type of guests their accommodations are thought for, if they are for people looking for high

[71] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.
[72] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.

quality standards (Airbnb Plus), if they are for people looking for luxurious stay experiences (Airbnb luxe), if they are for people looking for a place to live in for a short period for job reasons and so on. Another customer segmentation criterion for hosts can be the reason why they join the platform; they might be willing to earn extra money from their extra space or they might want to create their primary source of income from the accommodations they provide. Other segmentation criteria might be the experiences they provide guests with, if they provide food, tourism activities, and so on, and the type of location of their accommodations, if they are close to strategic points of the city, if they are located in rural or suburban areas and so on.

3.2.6 Channels

When it comes to the channels used by Airbnb, we can divide them into two categories: marketing and sales channels and transaction channels (Uenlue, M., 2020)[73]. The former includes several channels such as: word of mouth that can be very effective in helping potential users, both guests and hosts, to overcome their scepticism regarding the platform; social media, and digital ad campaigns. The latter refers to the website where it is possible to conclude the transactions but also the app that Airbnb launched in 2010. Unlike most companies operating in the travel industry that want to expand as much as they can their sales volume by exploiting all the possible channels, Airbnb wants to build up direct relationships with its customers avoiding forms of intermediary.

3.2.7 Customer relationships

For Airbnb, customer relationship represents an important element of the business model. When it comes to this point it is important to highlight that on top of hosts and guests who can be considered the direct customers of Airbnb since they are the active users of the platform, it is necessary to consider other parties Airbnb needs to have relationships with, such as governments and local communities. Regarding its relationship with hosts and guests Airbnb needs to manage it carefully, striving to ensure safety and high quality of the service provided. In addition, Airbnb needs to keep on delivering value to both parties and to possibly increase it and improve its services. Airbnb must manage the relationship with its active users also for avoiding being at odds with local communities. In fact, Airbnb needs make sure that the guests of the accommodations listed on its platform do not behave in a way that may cause problems to the neighbours, as guests might behave differently

[73] Uenlue, M. (2020). *Airbnb Business Model Canvas.* Retrieved from https://innovationtactics.com/business-model-canvas-airbnb/#value-proposition.

form how they behave when they are not on a trip. Moreover, Airbnb has to be careful with governments since its way of doing business may be against the regulation of the countries its hosts' accommodations are located in.

3.2.8 Revenue structure

Airbnb generates revenue from two sources: hosts and guests. Airbnb charges a fee between 6% and 12% on the amount paid by the guests for their accommodation and it also charges hosts with a 3% fee for every completed booking. On top of this model, Airbnb has recently developed a new revenue model that is exclusive for those that are classified as professional hosts, who are those that use the platform to run a business. In this case, no fee to guests is charged but Airbnb makes hosts pay a fee between 14% and 16% on the amount due for the accommodation[74]. Airbnb's revenue model is summarised in the figure below (**Figure 5**):

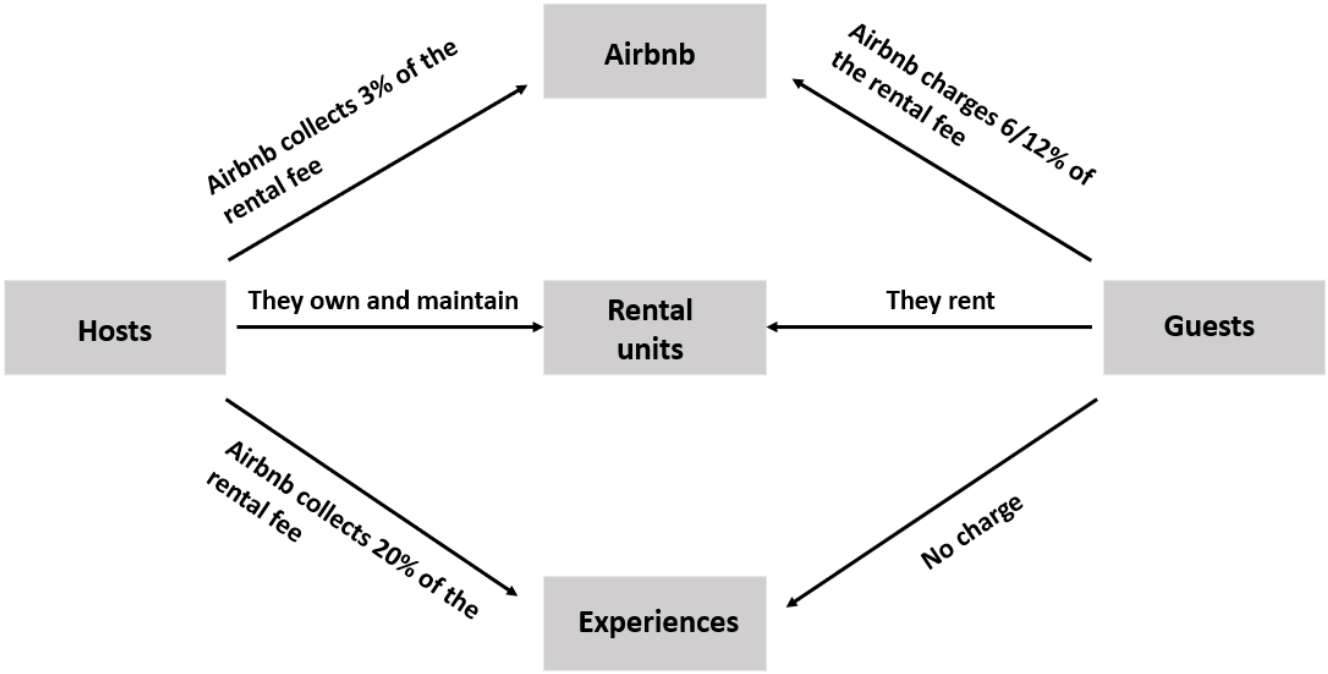

Figure 5: Airbnb's revenue model.

[74] https://www.smoobu.com/en/blog/airbnbs-new-fee-structure-for-professional-hosts-host-only-fee-model/#:~:text=Airbnb%20is%20switching%20Professional%20Hosts,total%20fees%20will%20actually%20drop.

3.2.9 Cost structure

When it comes to the cost structure, it is possible to say that Airbnb has several costs. First of all, Airbnb faces payment processing costs, including merchant fees and chargebacks, costs associated with third-party data centres used to host the platform, and amortization of internally developed software and acquired technology that are defined as cost of revenue[75]. Another category of costs is that of the operational and support costs which includes: personnel-related expenses and third-party service provider fees associated with community support provided via phone, email, and chat to hosts and guests; customer relations costs, which include refunds and credits related to customer satisfaction and expenses associated with our host protection programs; and allocated costs for facilities and information technology[76]. Among the costs, it is possible to find product and development costs which primarily consist of personnel-related expenses and third-party service provider fees incurred in connection with the development of our platform, and allocated costs for facilities and information technology[77]. Sales and marketing represent another source of costs and this category primarily consists of brand and performance marketing, personnel-related expenses, including those related to our field operations, policy and communications, portions of referral incentives and coupons, and allocated costs for facilities and information technology[78]. Finally, general and administrative is another category that primarily consists of personnel-related expenses for management and administrative functions, including finance and accounting, legal, and human resources, certain professional services fees, general corporate and director and officer insurance, allocated costs for facilities and information technology, indirect taxes, including lodging tax reserves, and bad debt expense[79]. Airbnb faces other costs such as financial expenses and restructuring charges[80].

[75] Airbnb annual report. Retrieved from https://d18rn0p25nwr6d.cloudfront.net/CIK-0001559720/2a413af0-3429-4317-9d3c-a71f2d6d2683.pdf.
[76] Airbnb annual report. Retrieved from https://d18rn0p25nwr6d.cloudfront.net/CIK-0001559720/2a413af0-3429-4317-9d3c-a71f2d6d2683.pdf.
[77] Airbnb annual report. Retrieved from https://d18rn0p25nwr6d.cloudfront.net/CIK-0001559720/2a413af0-3429-4317-9d3c-a71f2d6d2683.pdf.
[78] Airbnb annual report. Retrieved from https://d18rn0p25nwr6d.cloudfront.net/CIK-0001559720/2a413af0-3429-4317-9d3c-a71f2d6d2683.pdf.
[79] Airbnb annual report. Retrieved from https://d18rn0p25nwr6d.cloudfront.net/CIK-0001559720/2a413af0-3429-4317-9d3c-a71f2d6d2683.pdf.
[80] Airbnb started recording restructuring charges in 2020 as a consequence of the pandemic and they include primarily consist of costs associated with a global workforce reduction in May 2020, lease impairments, and costs associated with amendments and terminations of contracts, including commercial agreements with service providers.

3.3 Financial valuation

This section contains an explanation of the Airbnb's financial valuation performed. The idea is to evaluate Airbnb from a financial point of view a few days before the date of its IPO which was on the 10th of December 2020. To do so, the DCF and multiples method were used.

3.3.1 DCF method

To use this methodology a forecast of the income statement and the balance sheet[81] of Airbnb was performed. This forecast is based upon the historical financial data of the firm from 2015 to 2020, as well as information regarding comparable companies, information available online regarding the future of the company and data from its prospectus[82]. To evaluate the company before its IPO, the data of the fourth quarter of 2020 were not taken into consideration. However, an estimate of the last quarter data of 2020 was made based on the available historical data. The time horizon chosen to evaluate the company is 10 years since it was thought that it would be the best one to deliver appropriate and reliable results.

3.3.2 Gross booking value forecast

The valuation using the DCF method started from the gross booking value. This item is defined by the company in its prospectus as "the dollar value of bookings on our platform in a period and is inclusive of host earnings, service fees, cleaning fees, and taxes, net of cancellations and alterations that occurred during that period"[83]. It is one of the business metrics used by Airbnb to evaluate their performance, identify trends, formulate financial projections, and make strategic decisions. For this reason, it is the starting point of the valuation. In order to estimate the gross booking value of the company throughout the considered period (2021-2030), its historical values were analysed (**Table 8**). Before doing so, the annual gross booking value in 2020 was estimated. In order to estimate this value, the data provided by the company in its prospectus were used. In fact, since gross booking value data were available as of 31st December 2019, as of 31st September 2019 and as of 31st September 2020, the ratio between the gross booking value as of 31st September 2019 and its value as of 31st December 2019 was computed and then it was used to compute the gross booking value as of

[81] financial data were taken from Refinitiv.com and from the prospectus of Airbnb. (https://www.sec.gov/Archives/edgar/data/1559720/000119312520294801/d81668ds1.htm)
[82] Airbnb's prospectus. Retrieved from https://www.sec.gov/Archives/edgar/data/1559720/000119312520294801/d81668ds1.htm.
[83] Airbnb IPO prospectus. Retrieved from: https://www.sec.gov/Archives/edgar/data/1559720/000119312520294801/d81668ds1.htm.

31st December 2020 by multiplying the gross booking value as of September 2020 for 1 and by diving the result for the ratio computed. Basically, the assumption was that in percentage terms the annual Gross booking value in 2020 was the same as the annual gross booking value in 2019 compared to its value as of 31st September[84]. At this point, using the past values, the annual variation of the gross booking value was computed for each year from 2015 to 2020 (**Table 8**). After that, the median of the annual variations was calculated. The median and not the average was used in order not to have a value strongly affected by the negative effects on the company performance due to Covid-19 pandemic[85]. The median value was adopted as the GBV[86] growth rate for the first forecasted year (2021). In fact, the gross booking value is expected to grow over time but at a lower rate from year to year. In 2030 it was assumed that the GBV growth rate is equal to the projected US inflation rate. Based on that, the decrease of the annual GBV growth rate was estimated, obtaining as a result a rate of -4,22% and after that, the GBV was computed for each year of the forecast period.

	2015	2016	2017	2018	2019	2020
Gross booking value	8.057,70	13.924,80	20.975,30	29.440,70	37.962,60	23.211,94
Change YoY GBV		72,81%	50,63%	40,36%	28,95%	-38,86%

Table 8: GBV historical data and change YoY of GBV (data in thousand dollars).

3.3.3 Revenue forecast

The annual revenue for the forecast period was computed as a ratio of the gross booking value. In order to define the expected Revenue/GBV ratios, also in this case the historical revenue data for the 2015-2020 period were analysed (**Table 9**). Also in this case, it was necessary to estimate Airbnb's revenue as of 31st December 2020. The same assumption as for the GBV was made to estimate this value. After that, the historical revenue/GBV ratios were calculated, and their median was computed leading to a result of 12,31%. The following step was to compute the annual variations of these ratios. Also for them the median was calculated (0,32%). For the first forecasted year the revenue/GBV ratio was obtained as the sum of the median value of the annual variations plus the median value of the historical revenue/GBV ratios, leading to a result of 12,63%.

[84] the same assumption was used to estimate in 2020 annual revenue, cogs, SG&A expenses, net working capital, capital expenditures, and depreciation.
[85] the median was used also in the forecasts of the other elements that were necessary to apply the DCF method for the same reason.
[86] Gross booking value.

Based on the information provided in the prospectus, it was assumed that the revenue/GBV ratio is expected to increase over time. For this reason, the median of the annual variations of the revenue/GBV ratio was used as its growth rate. Thus, the forecasted revenue was computed as the product between the GBV and the Revenue/GBV ratio for each year of the forecasted period.

	2015	2016	2017	2018	2019	2020
Revenue	919,04	1.655,58	2.561,72	3.651,99	4.805,24	3.272,75
Rev/GBV	11,41%	11,89%	12,21%	12,40%	12,66%	14,10%
Change YoY Rev/GBV		0,48%	0,32%	0,19%	0,25%	1,44%

Table 9: Revenue historical data, revenue/GBV historical data and change YoY of the revenue/GBV ratio (data in thousand dollars).

3.3.4 Total operating expenses forecast

Once the revenue was estimated for the entire forecast period, the total operating expenses were computed. In order to do so, the total operating expenses were split into COGS and SG&A expenses. As done previously, the annual COGS (**Table 10**) and SG&A expenses (**Table 11**) as of 31 December 2020 were computed making the same assumption made for the GBV. Once all the necessary data were available, the median values of the COGS/Revenue and of the SG&A/Revenue ratios were obtained by applying the same reasoning as for Revenue/GBV. The results were a median value of 41,56% for the COGS/Revenue ratio and of 67,64% for the SG&A/Revenue ratio. To forecast the total operating expenses throughout the chosen time horizon, the median of the total operating expenses/revenue ratios was calculated as the sum of the median values of COGS/revenue and SG&A expenses/revenue, leading to result of 109,19%. If it is true that the company is going to face higher administrative costs as a consequence of the IPO, it is also true that as the business grows, thanks to the economy of sale other costs such as product and development, marketing and sales are expected to decrease in percentage terms. For this reason, it was assumed that the total operating expenses/revenue ratio is going to decrease each year over the considered period at a constant rate. Since the company is expected to have positive operating margins in the future, it was assumed that the total operating expenses/revenue ratio is expected to decrease at a 2% rate each year starting from 2022. The median of this ratio was used to compute the total operating expenses in 2021.

	2015	2016	2017	2018	2019	2020
COGS	407,68	683,04	1.043,43	1.473,23	2.011,39	1.625,00
COGS/Rev	44,36%	41,26%	40,73%	40,34%	41,86%	49,65%

Table 10: COGS historical data, COGS/revenue historical data (data in thousand dollars).

	2015	2016	2017	2018	2019	2020
Selling, General & Administrative Expenses	635,06	1.105,53	1.599,65	2.160,01	3.291,50	2.493,38
SG&A/Rev	69,10%	66,78%	62,44%	59,15%	68,50%	76,19%

Table 11: SG&A historical data, SG&A/revenue historical data (data in thousand dollars).

3.3.5 Capex forecast

In order to compute the forecasted capital expenditures for the considered period, the historical ratios capex/revenue (**Table 12**) were calculated. For obtaining the capital expenditures as of 31st December 2020 the same assumption made for the GBV was utilized. Once the capex/revenue ratios were computed from 2015 to 2020[87], the median of these ratios was calculated, obtaining as a result 2,55%. This value was used to compute the capex for each year of the forecast period. This value was kept constant since it was assumed that the company is going to invest as it did in the last three years, since there is no available information regarding the possibility of the launch of a new product or of some significant new investments.

	2015	2016	2017	2018	2019	2020
Capex/Rev	0,00%	0,00%	3,91%	2,48%	2,61%	1,14%

Table 12: Capital expenditures/revenue historical data.

3.3.6 Depreciation and amortization forecast

Once the forecasted capex values were computed, the depreciation for the future years was estimated. To do so, the past depreciation/capex ratios (**Table 13**) for the period 2015-2020[88] were examined. This choice was made because if the company invests more in capex the depreciation will increase over time, highlighting a strong relationship between these two elements. Also in this case, the annual value of the depreciation in 2020 was determined by using the same assumption used for the GBV. The median of these ratios was calculated, leading to a result of 90,94%. This value was then useful for computing the depreciation for each year of the forecast period.

[87] the useful data are only those from 2017 to 2020 as in 2015 and 2016 no capital expenditures were recorded.
[88] the useful data are only those from 2017 to 2020 as in 2015 and 2016 no depreciation was recorded.

	2015	2016	2017	2018	2019	2020
Depreciation&Amortization/Capex	-	-	79,14%	90,93%	90,95%	375%

Table 13: Depreciation and Amortization/Capital expenditures historical data.

3.3.7 Net working capital forecast

For determining the future values of the net working capital, the historical NWC/revenue ratios (**Table 14**) were estimated for the period 2015-2020. As usual, the annual NWC in 2020 was obtained by using the same assumption made for the GBV. Then, the median of these ratios was computed resulting in a –32%. This value was used to compute the NWC for each year of the forecasted period. This kind of reasoning was applied since the NWC depends mainly on the revenues of the company.

	2015	2016	2017	2018	2019	2020
NWC	-	-	-	-1.034	-1.516	-2.223
Change in NWC		-	-	-1.034	-482	-707
NWC/Revenue	-	-	-	-28%	-32%	-68%

Table 14: Net Working Capital, change in Net Working Capital, Net Working Capital/Revenue historical data.

3.3.8 Beta calculation

As Airbnb was not listed, the only way to compute its unlevered beta was to compute it from the comparable firms. For computing the unlevered beta of Airbnb, the monthly historical prices of the comparable firms were taken into consideration and analyzed. The time-period considered for the historical prices was from 31/12/2014 to 31/12/2019. The monthly historical prices related to 2020 were not taken into account since this year is strongly affected by the Covid 19 pandemic. All the other data used for calculating the Airbnb's unlevered beta refer to 2019 too, also in this case in order not to have values strongly influenced by the negative effects caused by the pandemic. Specifically, the values of market capitalization, debt market value, financial leverage and tax rate. Once the unlevered beta was calculated for each company, the unlevered beta of Airbnb was computed as the average of the unlevered betas of its comparable firms, leading to a result of 0,932.

3.3.9 WACC calculation

First of all, in order to compute the weighted average cost of capital (WACC), the cost of equity of the firm and its cost of debt were calculated. The cost of equity was estimated by using the CAPM formula. In order to apply this formula, as risk-free rate the yield to maturity of the American treasury bond[89] with expiration in 10 years was chosen since the United States are considered a risk-free country. As the debt/equity ratio target, the average of the debt/equity ratios of the comparable firms was used which was roughly 21,6%. Then, the beta unlevered of Airbnb was levered by using the Hamada equation[90]; in this equation as tax rate, the average of the tax rates of comparable firms was utilized since no reliable and consistent data were available for Airbnb in terms of tax rate. The beta levered obtained by applying this formula was roughly equal to 1,08. As market risk premium was used the equity risk premium for the USA provided by A. Damodaran[91] for 2020, which was equal to 5,12%. Once all the necessary data were available, by applying the CAPM formula, the cost of equity calculated was 6,45%. Regarding the cost of debt, the reasoning applied was the following. Since Airbnb was considered as a company operating between two different industries, the hotel and the software (internet) industry[92], as pretax cost of debt the average of the pretax costs of debt[93] of the two industries was used, which was 3,47%. After that, the after-tax cost of debt was utilized to apply the WACC[94] formula. The weighted average cost of capital computed was equal to 5,77% and it was assumed to be constant over the forecast period. A summary of the WACC estimation is given by the table below (**Table 15**):

[89] Data retrieved from https://tradingeconomics.com/

[90] $\beta_L = \beta_U \left[1 + (1 - T)\left(\frac{D}{E}\right)\right]$

[91] Data retrieved from: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

[92] the reason why Airbnb was considered as a company operating in these two industries is better explained in the section related to the Multiples method

[93] this data was taken from the Damodaran website. https://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.htm

Cost of equity (Ke)	
Risk-free rate	0,90%
Unlevered beta from beta calculation	0,932
D/E target	21,60%
Relevered beta	1,08
Tax rate	24,25%
Market risk premium	5,12%
Cost of equity (Ke)	6,45%

Cost of debt (Kd)	
Cost of debt (Kd) pre tax	3,47%
Cost of debt (Kd) after tax	2,63%

Financial structure	
Weight of equity	82,24%
Weight of debt	17,76%

WACC	5,77%

Table 15: summary of WACC estimation.

3.3.10 Share price calculation

Once all the necessary elements for applying the DCF method were found, the enterprise value was computed. By subtracting the net financial position from the enterprise value, the market value of the equity was calculated. By dividing the equity market value by the number of shares, a share price of $45,57 was determined. The share price obtained is much lower than both the offering price for the IPO which was equal to $68 and the closing price after the first day of trading which was equal to $144,71.

3.3.11 Sensitivity analysis

Since this analysis is driven by a series of assumptions, it is important to perform a sensitivity analysis (**Table 16**) in order to evaluate how the share price of Airbnb might differ from the one obtained with the analysis previously explained, depending on the different assumptions that might have been made. In the model proposed, the two key drivers of Airbnb's share price are the GBV and the annual growth rate of the total expenditures/revenue ratio. GBV is one of the two most important elements because the amount of annual revenue directly depends on it and to the annual revenue all the other components of the model are linked. The other key element is the annual growth rate of the total operating expenses/revenue since it is fundamental for determining the operating margin of the company. The table below summarizes the sensitivity analysis performed, and there are two important observations that can be made. First of all, it is evident that no matter

what the GBV in 2020 is, if the total operating expenses/revenue ratio decreases at a 1% rate per year the share price is not even positive since the EBIT of the company stays negative over the entire forecast period, leading to negative FCFOs and a negative enterprise value. What is more interesting is what can be drawn by looking at the different values of the GBV. In fact, it must be said that this valuation is strongly affected by the negative effect due to the Covid-19 pandemic on the Airbnb performance in 2020, even if some reasonings were made with the purpose of limiting these negative implications. In fact, if a comparison between the values of the GBV values in 2019 (roughly $39 bn) and 2020 (roughly $23 bn) is made, it is possible to see that from one year to the other the GBV dropped by 38,86%. On the other hand, without Covid-19, following the growth path of the GBV of Airbnb from 2015 to 2019, in 2020 the GBV could have been equal to roughly $55 bn, which means more than double the value used for this analysis. In fact, with the same assumptions but with a GBV in 2020 of $55 bn, the share price of the company would have been equal to $102,52 which is dramatically much closer to the closing price of the first day of trading ($144,71) than that obtained with DCF model ($45,2). In addition, it was interesting to see how the share price would have changed if the WACC had been different (**Table 17**). In fact, the WACC is the result of a set of assumptions for choosing the input data that are necessary for its calculation. Moreover, the WACC describes also the level of risk of the company and for this reason it was thought that it was interesting to see what the Airbnb's share price would be with different levels of risk. The result was that with a WACC of 5% (the lowest level of risk assumed) the share price is $60,65 whereas with a higher level of risk corresponding to a WACC of 7% the share price is $32,11.

		Total opex/Rev growth rate					
	$ 45,42	-1,00%	-1,50%	-2,00%	-2,50%	-3,00%	-3,50%
	$ 20.000,00	$ -1,58	$ 19,04	$ 39,65	$ 60,26	$ 80,88	$ 101,49
	$ 21.000,00	$ -1,84	$ 19,80	$ 41,45	$ 63,09	$ 84,73	$ 106,38
	$ 22.000,00	$ -2,11	$ 20,57	$ 43,24	$ 65,92	$ 88,59	$ 111,27
	$ 23.211,94	$ -2,43	$ 21,50	$ 45,42	$ 69,34	$ 93,27	$ 117,19
GBV	$ 24.000,00	$ -2,64	$ 22,10	$ 46,84	$ 71,57	$ 96,31	$ 121,04
	$ 25.000,00	$ -2,90	$ 22,86	$ 48,63	$ 74,40	$ 100,17	$ 125,93
	$ 26.000,00	$ -3,17	$ 23,63	$ 50,43	$ 77,23	$ 104,02	$ 130,82
	$ 27.000,00	$ -3,43	$ 24,40	$ 52,22	$ 80,05	$ 107,88	$ 135,71
	$ 28.000,00	$ -3,70	$ 25,16	$ 54,02	$ 82,88	$ 111,74	$ 140,60
	$ 29.000,00	$ -3,96	$ 25,93	$ 55,82	$ 85,71	$ 115,60	$ 145,49
	$ 30.000,00	$ -4,23	$ 26,69	$ 57,61	$ 88,53	$ 119,45	$ 150,37
	$ 40.000,00	$ -6,88	$ 34,35	$ 75,58	$ 116,80	$ 158,03	$ 199,26
	$ 45.000,00	$ -8,20	$ 38,18	$ 84,56	$ 130,94	$ 177,32	$ 223,70
	$ 50.000,00	$ -9,53	$ 42,01	$ 93,54	$ 145,07	$ 196,61	$ 248,14
	$ 55.000,00	$ -10,85	$ 45,84	$ 102,52	$ 159,21	$ 215,90	$ 272,58

Table 16: sensitivity analysis (data in thousand dollars).

WACC	$	45,57
5,00%	$	60,65
5,25%	$	54,85
5,50%	$	50,00
5,78%	$	45,42
6,00%	$	42,35
6,25%	$	39,28
6,50%	$	36,59
6,75%	$	34,22
7,00%	$	32,11

Table 17: different share prices with different values of WACC.

3.3.12 Results

From the comparison between the share price computed with the DCF method and the closing price of the first day of trading, it is possible to conclude that the share price of Airbnb is not justified by its fundamentals. Airbnb share price is probably driven by very positive expectations of investors. In fact, as it was noticed with the sensitivity analysis, a share price of $145,07 which is very similar to the closing price of the first day of trading is expected with a GBV of $50 bn and with a growth rate of the total operating expenses/ revenue of –2,5%. This could mean that investors might have expected Airbnb to recover very soon from Covid-19 and almost to get back to the performance standards recorded before the breakdown of the pandemic and they might also have expected the company to have higher operating margins in the future years. In addition, Airbnb's share price might also have been driven by the expansionary monetary policies implemented in response to Covid-19.

3.3.13 Multiples method

As previously mentioned, for performing this valuation of Airbnb, a set of comparable firms was identified. In order to explain why these companies was considered as similar to Airbnb, it is useful to remind of which kind of business is that of Airbnb. It is evident that when thinking of Airbnb what comes to mind is something similar to a hotel, as it provides guests with accommodations. Indeed, Airbnb operates in the hotel industry as the service it offers is extremely similar to the one offered by hotels. In fact, hotels and hotel chains see Airbnb as a competitor since with its business model it has revolutionized the hotel industry. Thus, on one hand, some of the largest hotel chains based in the USA were included among the comparable firms of Airbnb. On the other hand, it is also important to realize that in terms of business model Airbnb is not that similar to hotel chains. One of the most evident differences is that Airbnb does not own any room or apartment, unlike hotels.

Thus, Airbnb acts more as an intermediary operating in the online short-term rentals (software internet industry). For this reason, other two companies, Booking.com and Expedia, were included in the list of comparable firms for Airbnb because of some similarities in terms of business model. In fact, it is possible to say that also Booking.com and Expedia acts as intermediaries in the online travel booking industry. Truth to be told, these two organizations run two other businesses on top of acting as an intermediary, that are the merchant business and the online advertising. With the merchant business they buy big blocks of hotel rooms at a discount rate and then they sell rooms at higher rates whereas with the online advertising they basically make money by selling advertising spots on their online platforms. Thereby, due to those similarities and differences it was thought that the best solution was to include both these hotel chains and online travel agencies among the comparable firms of Airbnb. While using the multiple method, the following reasoning was applied: multiples were computed considering in one case only the US based hotel chains, in a second case considering only the online travel booking companies and in a third case considering the two group of firms all together. As it can be noticed from the table (**Table 18**), Airbnb has negative net income and EBIT and for this reason these values were not considered for the multiples method. Taking into consideration only the US based hotel chains (**Table 19**), the only two multiples computed were EV/Sales[95] and P/Sales[96]. In this case the share price of Airbnb considering the average EV/Sales multiple is equal to $57,10 whereas using the average P/Sales multiple it equals $44,20. On the other hand, when looking at the online travel agencies (**Table 20**) also another multiple was taken into account since it refers to a metrics that is common to the three companies, that is the EV/GBV[97]. In this case the share price of Airbnb considering the average EV/GBV multiple is equal to $34,15 whereas looking at the average of EV/Sales and P/Sales multiples it is respectively $29,97 and $24,86. In the last case, when the two groups of companies were considered together (**Table 21**), the multiples used were only the EV/Sales and the P/Sales as they are common to both the sets of companies. Using the average EV/Sales the share price is equal to $48,06 whereas considering the average P/Sales it is $37,76. Since the initial offering price at IPO was $68 which means a valuation of nearly $47 billion and taking into consideration that at the end of the first day of trading Airbnb closed at a share price of $144,71, the results obtained with the multiples method in all the three cases make it clear that Airbnb was overvalued in comparison with its comparable firms.

[95] Enterprise value/Sales
[96] Price/Sales
[97] Enterprise value/Gross booking value

Airbnb Data as of 31/12/2019		
in thousand		
Gross Booking Value	$	37.962.600
Revenues	$	4.805.239
Net Financial Position	$	2.654.877
Net Income	$	(674.339)
EBIT	$	(501.543)

Table 18: Airbnb's key financial data as of 31st December 2019.

Hotel chains				
Airbnb's share price	**EV/Sales**		**P/Sales**	
Average	$	57,10	$	44,20
Min	$	31,09	$	25,28
Max	$	84,22	$	65,98

Table 19: Airbnb's share price considering only Hotel chains.

Travel booking companies						
Airbnb's share price	**EV/Sales**		**EV/GBV**		**P/Sales**	
Average	$	29,97	$	34,15	$	24,86
Min	$	14,84	$	13,58	$	9,30
Max	$	45,10	$	54,73	$	40,43

Table 20: Airbnb's share price considering only Travel booking companies.

Hotel chanis and travel booking companies				
Airbnb's share price	**EV/Sales**		**P/Sales**	
Average	$	48,06	$	37,76
Min	$	14,84	$	9,30
Max	$	84,22	$	65,98

Table 21: Airbnb's share price considering both Hotel chains and travel booking companies

3.3.14 Airbnb share price performance after IPO

Here what is interesting to look at is that the share price of Airbnb from the first day of trading until the 8th of May 2020 (**Figure 6**) has never been below $124,8, reaching a peak of 216,84 on the 11th of February 2021. This is powerful since it tells that since more than one year from its IPO on average the share price of the company has been equal to $164,98 which is even higher than the closing price of the first day of trading. This means that over this period investors have kept on having very positive expectations about the performance of the firm and that these positive expectations together with irrational behavior have been the drivers of Airbnb's share price so far and not its fundamentals.

Figure 6: Airbnb's daily share price after IPO. (Source: Refinitiv[98]).

[98] https://www.refinitiv.com/en/products/refinitiv-workspace/workspace-for-students

Conclusion

The purpose of this thesis was to understand if the share price of Airbnb, both at the moment of its IPO and on its first day of trading, was justified by the company's fundamentals.

Before performing an independent financial valuation of Airbnb by applying the DCF and multiples methods, an overview of what a start-up is, was provided. In particular, the main exit ways for start-ups were briefly discussed, highlighting the main trends of the last years regarding start-ups' exits.

In the second chapter of this thesis, a theoretical explanation of the DCF and multiples methodologies was given to highlight the most important features of the methods used to evaluate Airbnb. In this chapter, also the most used methodologies ad hoc created for performing financial valuations of start-ups were presented, even though they were not used to perform the valuation of Airbnb. These methodologies were not applied for the Airbnb case, as there was enough information about the company and its financial history to allow the use of the DCF and multiples methodologies, which are the most applied methods in practice. However, they were presented to make it clear the particularity of start-ups when it comes to evaluating them from a financial point of view.

In the third chapter, the history of the company was presented, from the very beginning to the IPO. In addition, the business model of Airbnb was discussed in a detailed way by using the Business Model Canvas tool.

After that, the assumptions and the reasoning made for applying the DCF and multiples methods were explained in a detailed way, to justify the results obtained. From the methodologies used, it was possible to conclude that Airbnb's share price was not justified by its fundamentals. Rather, the company's share price might have been driven by the very positive investors' expectations about the firm's performance, the irrational behaviour of investors that is typically common in the IPOs of well-known and highly hyped companies, and the expansionary monetary policies implemented in response to Covid-19.

The analysis implemented provides a clear explanation of how the DCF and multiples methodologies can be applied in a practical way to evaluate investment opportunities. The limitations of this work are related to the assumptions made to estimate the future values useful for the application of the DCF method and to the reasoning elaborated to choose the set of comparable firms of Airbnb for the application of the multiples method. However, it is also true that financial valuation can be considered more as an art rather than a precise science, as the results are strongly affected by the assumptions made for applying the several methodologies.

This thesis still provides a solid reference point for the application of the DCF and multiples methodologies for start-ups that have reached a very late stage in their lifecycle as it was the case of Airbnb.

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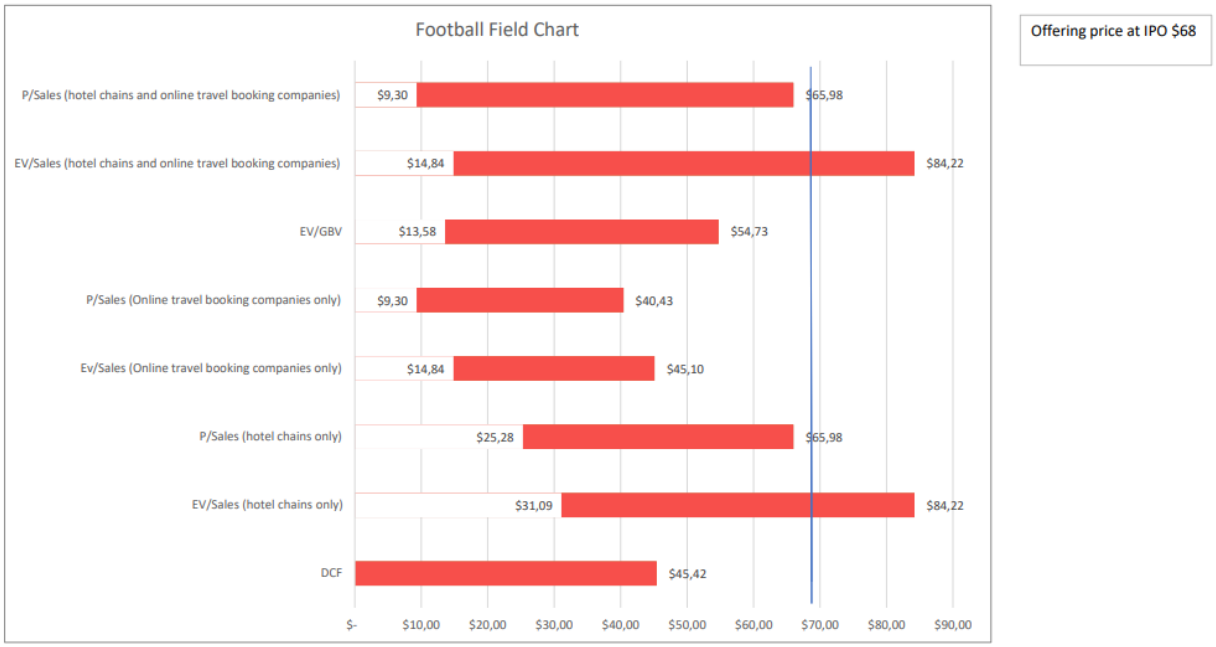
Appendix

Appendix A: FCFO forecast

		Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
FCFO Forecast	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gross Booking Value	23.211,94	32.580,02	44.354,85	58.514,50	74.726,49	92.278,46	110.061,09	126.628,55	140.349,15	149.636,97	153.228,26
Revenues	3.272,75	4.115,64	5.746,61	7.770,48	10.165,18	12.851,42	15.684,12	18.454,81	20.908,61	22.776,50	23.818,97
tot opex	4.118,38	4.494,05	6.160,06	8.174,13	10.489,92	13.004,94	15.557,80	17.937,09	19.903,88	21.226,47	21.721,62
EBITDA	- 845,63	- 378,42	- 413,45	- 403,65	- 324,74	- 153,53	126,32	517,73	1.004,74	1.550,03	2.097,35
dep and am	139,75	95,29	133,06	179,92	235,36	297,56	363,15	427,30	484,12	527,36	551,50
Ebit	- 985,38	- 473,71	- 546,50	- 583,56	- 560,10	- 451,09	- 236,83	90,43	520,62	1.022,66	1.545,85
tax rate	24,25%	24,25%	24,25%	24,25%	24,25%	24,25%	24,25%	24,25%	24,25%	24,25%	24,25%
Taxes	- 238,95	- 114,87	- 132,53	- 141,51	- 135,82	- 109,39	- 57,43	21,93	126,25	248,00	374,87
NOPAT	- 746,42	- 358,84	- 413,98	- 442,05	- 424,28	- 341,70	- 179,40	68,50	394,37	774,67	1.170,98
Depreciation and amortization	139,75	95,29	133,06	179,92	235,36	297,56	363,15	427,30	484,12	527,36	551,50
NWC	- 2.222,75	- 1.298,59	- 1.813,21	- 2.451,79	- 3.207,38	- 4.054,96	- 4.948,75	- 5.822,98	- 6.597,22	- 7.186,59	- 7.515,51
Change in NWC	- 706,57	924,15	- 514,62	- 638,59	- 755,59	- 847,58	- 893,79	- 874,23	- 774,24	- 589,37	- 328,93
Capex	37,26	104,79	146,31	197,84	258,81	327,20	399,32	469,87	532,34	579,90	606,44
FCFO	62,62	- 1.292,48	87,38	178,61	307,87	476,24	678,22	900,16	1.120,39	1.311,50	1.444,97
Discount factor		0,945437104	0,893851318	0,845080201	0,798970178	0,755376052	0,714160547	0,675193879	0,638353346	0,603522939	0,57059298
Discounted FCFO		- 1.221,96	78,11	150,94	245,98	359,74	484,36	607,78	715,20	791,52	824,49

Appendix B: Football Field Chart



Appendix C: input for share price calculation

EV	28.080,15
Cash	4.495,21
Debt	1.997,50
NFP	- 2.497,71
EQ	30.577,86
Number of shares outstanding	671,064

Summary

Introduction

Over the last 20 years, start-ups have gained great importance in the world economy. Innovative start-ups have become sources of inspiration for many entrepreneurs to start working on their own business idea.

The term start start-up is known by almost everyone, also by people who have no knowledge and expertise in the business field. Many people know this term but not all of them really know what a start-up is. If the definition of start-up is somewhat complicated for many people, performing a financial valuation of this kind of companies is something even harder. Their definition and the way their financial valuations are performed are strictly linked, since, in order to understand how to perform a financial valuation of start-ups, a precise knowledge of their business and financial characteristics is required.

Providing correct valuations of start-ups is important, as they have started playing an important role also in the public stock markets. In fact, the most successful start-ups, after going through several stages during their lifecycle, end up being acquired by other larger companies or going public through IPOs. In particular, especially for those start-ups that have revolutionized an industry, when the time of their IPO comes, it catches the interest of many people, such as, investors, media, competitors, and so on.

Airbnb is a clear example of a start-up that has revolutionized an industry, namely the hotel industry, by developing an innovative business model and whose IPO has been quite hyped by media since the company filed the prospectus on the 16th of December 2020, but rumors of going public had started in 2016.

Airbnb went public on the 10th of December 2020 and at that time, the company was in a very late stage of the start-up's lifecycle, as it was one of the most known unicorns all over the world, having recorded a valuation of $18 billion in April 2020 in a private fundraising round. Airbnb's IPO was the biggest IPO in the U.S. in 2020, the company opened at $146 on the Nasdaq, far above the IPO price of $68; during the first day of trading, Airbnb's share price reached a peak of $165 and closed at $144,71.

This thesis aims to understand if the valuation of Airbnb, at the moment of its IPO and on the first day of trading, was justified by the fundamentals of the company.

To answer this question, the discounted cash flow method (DCF) and the multiples methodology have been applied. These methodologies have been used to define the share price of Airbnb in order to make it possible to compare this price with that of the IPO and the first day of trading. To better understand this analysis, the thesis has been divided into three chapters.

In the first chapter, an overview of what a start-up is provided. This section covers some of the several existing definitions of the start-up term, providing also an idea of what the business and financial characteristics of this specific type of organizations are. Then, the first chapter talks about the stages of start-ups' lifecycle and the several ways a start-up can be funded. In this section of the thesis, the main exit ways for such companies are introduced and the exit trends of the last years for start-ups are highlighted.

The second chapter gives a theoretical explanation of the most used traditional methodologies for performing a financial valuation of a company. Furthermore, in this section the most important financial valuation methodologies created ad hoc for start-ups are discussed.
The third and last chapter talks about Airbnb's history and its journey from start-up to IPO. In addition, the business model of Airbnb is described in a very detailed way by using the Business Model Canvas tool. Finally, a detailed explanation of the application of the DCF and multiples methodologies is provided. In this chapter, all the assumptions and the reasoning made for estimating the stock price of Airbnb at the moment of its IPO are discussed.

Chapter 1 – The start-ups' world

Definitions of start-ups

When it comes to the term start-up, it is important to realize that there is no unique definition for this kind of companies. For this reason, a good starting point might be to go through some of the definitions of this term. Paul Graham, a famous venture capitalist and co-founder of "Y Combinator" says that "a start-up is a company designed to grow fast". Steve Blank, the founder of the lean start-up movement and Bob Dorf, known as the "guru" of start-ups, claim that "a start-up is a temporary organization designed to search for a repeatable and scalable business model, working under conditions of extreme uncertainty". These two definitions highlight two very important characteristics of a start-up that are growth and the temporary nature of this kind of companies. Also, the term uncertainty is mentioned, and it represents something that every start-up must deal with. A definition that covers all the most important characteristics of a start-up is the following: "a start-up company is an entrepreneurial venture which is typically a newly emerged, fast-growing business that aims to meet a marketplace need by developing a viable business model around an innovative product, service, process or a platform. A start-up is usually a company designed to effectively develop and validate a scalable business model".

Business and financial characteristics

From a business point of view, it can be said that start-ups share 6 crucial characteristics:

1. New business model: they do not use business models already implemented and adopted by traditional organizations, but they strive to develop new business models that enable them to capture value from customers and turn it into revenue for the company.

2. Repeatability: the business model of this kind of companies must be not only new but also repeatable. A business model is repeatable when the start-up is capable of providing customers with its product or service with no inventory limit regardless of demand and with little need for customization and adaptation.

3. Scalability: another adjective that must be related to start-ups' business models is scalable. A business model is scalable when it enables the company to change in size by acquiring new customers.
4. Innovation: it is an intrinsic feature for this type of organizations since they come up with new products and services by using and exploiting innovative technologies to meet new customers' needs or even to create new needs for them.
5. Uncertainty: they have no certainty regarding the success of the project and the acceptance by the customer.
6. Temporary nature: no start-up is intended to stay a start-up forever.

When it comes to the financial characteristics of start-ups, it's feasible to say that they all produce negative economic results, which are characterized by negative net earnings most of the time. For start-ups, an ideal financial structure does not exist, but there are various pro-tempore structures that can be more or less suitable. For companies with high growth potential operating in fast-moving industries with high levels of operational risk, such as start-ups, the most appropriate solution is to use primarily equity, since implementing a financial structure with a significant portion of debt increases financial risk, and therefore it is a strategy better suited for companies operating in mature industries with lower operational risk. In high-growth situations, a balanced expansion might be allowed by the introduction of equity while avoiding financial risk from rising too quickly, resulting in unfavourable repercussions such as greater premium expectations and, as a result, a higher cost of capital.

The main stages of start-ups' lifecycle

Even though being a start-up refers to a transitional phase in the lifecycle of an organization, it is possible to define a lifecycle even for start-ups with several stages. Max Marmer, the founder of *Start-up Genome*, defines a life cycle for such organizations composed of 6 stages:

1. Discovery: this first stage, whose duration is between 5 and 7 months, sees the creation of the team and the development of an initial MVP (Minimum Viable Product) model.
2. Validation: in this stage lasting between 3 and 5 months start-ups start receiving the first funds called seed funding which is used to design the product or service.
3. Efficiency: this is the phase where between 5 and 6 months are spent on seeking efficiency both in terms of "production" and customer relationship.
4. Scale: in this stage, whose duration is between 7 and 9 months, start-ups strive to increase remarkably their customer base, also by entering new foreign markets, and attempts to scale up their production, even by hiring new staff and restructuring the organizational chart.
5. Maintenance: this is the phase where the start-ups are called to keep their projects up and to continue running their business in the best possible way.

6. Sale or renewal: in the last stage, such organizations can rely on business models that work well. At this point, the founder has two options: either selling the company or going public.

How start-ups are financed

When talking about start-ups financing it is possible to define three stages of a start-up life cycle on which the amount and the purposes of the investments depend:

1. Early stage: in this phase, the riskiness of the project is high since there is only a business idea whose feasibility still has to be confirmed. At this moment, there is the pre-seed funding phase where money is invested by founders and the so-called supporters "3F". Then, there is the seed funding phase where the main investors are business angels, public institutions, and incubators. Once the product or service has been validated by customers and the business model has demonstrated to work well and to have growth potential, the start-up can look for new investors through Series A rounds, where investors are Venture capital funds.

2. Expansion stage: in this stage, the firm has already achieved some positive results generating the first sales, but it can seek new funds through Series B and Series C rounds to focus on profits and expand the business by enlarging the team, entering new markets, and scaling up sales.

3. Late stage: in this last stage start-ups prefer to get new funds that have no dilution effect on equity but since getting access to bank loans is too expensive, they rely on hybrid forms of investment which are typically the mezzanine capital and the bridge loans. he last stage of the start-up funding cycle coincides with the liquidation of shares by shareholders, either through acquisition operations by other companies, IPOs, or LBOs.

Business angles

Business angels are wealthy people whose typical investments are between 15 and 250 thousand dollars. What makes them different from institutional investors of high-risk capital whose funds come from sources such as pension funds, banks, and insurance companies that are legally obliged to make less risky investments, is the fact that business angels invest personal assets. They are typically people from 40 to 65 years old with university diploma and professional qualifications who have gained enough business experience and earned enough money. They invest in the early stage of start-ups providing them mostly with pre-seed and seed funds also because it is the stage where business angels can contribute the most to the development of the business. Business angels invest for several reasons that go from the return of investment which tends to be between 20 and 30 percent and finding a workplace for themselves. In the literature, there is evidence that start-ups financed by business angels are more likely to get funded by venture capital funds.

Venture capital funds

A clear and precise definition of Venture capital funds is the following: “Venture capital funds are pooled investment funds that manage the money of investors who seek private equity stakes in start-ups and small- to medium-sized enterprises with strong growth potential”. They differ from business angels for money invested and for the timing of investments. In fact, these funds provide start-ups with money in the very last moments of the early stage, meaning when the firm looks for a Series A round; they keep on investing in start-up also with Series B, C, and beyond rounds, providing impressive amounts of money in the range of millions of dollars. It is possible to claim that venture capital funds and business angels are not alternatives, but they complement each other. A return of between 30 and 50 percent per year over the lifetime of the investment is what they usually expect.

Incubators

They are organizations that aim to support the growth process of the start-up and ensure its future survival through a collaboration limited in time to a few years. Incubators operate at the beginning of the start-up's life cycle, when the idea is still in its infancy, and aid with the many tasks required for the company's growth, such as the drafting of a business plan. Since the early 2000s, a new sort of incubator, known as business accelerators, has evolved. These differ from traditional business incubators as they take a different approach with the start-ups they support, collaborating for a shorter period of time, usually three to six months, but interacting more frequently. Another difference is that accelerators operate at a later stage than incubators, necessitating the presentation of a first MVP even during the selection round. These companies are typically profit-driven, and given the brevity of the partnership with start-ups, they focus on sectors with a short time-to-market in order to achieve tangible results rapidly.

Exit ways for start-ups

As mentioned before, for start-ups that have structured and well-functioning business models the last stage is exit. The term exit refers to the moment when a significant change in the ownership structure of the company happens. There are several ways to exit for a late-stage start-up. The most known are IPOs and M&As. These ways can be described as follows:

1. IPO: IPO stands for initial public offering and with it, a start-up starts selling its shares on the public equity markets. Generally, a company relies on one or more investment banks to file for an IPO and this bank (or these banks) takes the name of “underwriter”. The underwriter is in charge of setting up the offering price of company shares and selling these shares to a pool of selected investors, with whom it usually has a relationship. Setting the offering price is a crucial step for any IPO, and for this reason, the underwriter performs a financial valuation of the company. To do this, several valuation methodologies can be used, but the most applied are the DCF and Multiple methodologies. After the IPO, the shares are traded on the stock exchange market chosen by the company in accordance with the underwriter.

2. M&As: mergers happen when a similar or larger company is looking for complementary skills on the market or because it wants to save time, so instead of developing a new product or service from scratch, it merges with a late-stage start-up. Acquisitions are mainly due to the same reasons, what is different is that the existing start-up stays an independent company. Another form of acquisition is the so-called "acquihires" which basically refers to acquisition plus hiring. This form of acquisition is driven by the willingness of the acquirer of having the team of the target start-up rather than its product or service.

Exit trends for start-ups

After 2000 three significant trends have been recognized regarding start-ups' exits. The first trend refers to the number of IPOs which has recorded a significant drop after 2000. The second trend is the rapid growth in the number of the so-called "unicorns", which are privately held start-up companies with a valuation of over $1 billion. The last trend is related to the larger fraction of Venture Capitalist backed start-ups that have exited via acquisitions.

Chapter 2 - Valuation methodologies

Start-ups valuation

Generally, when a company valuation is performed the useful information is taken out from three sources:

4. the company's current financial statement.
5. the company's financial history, commonly summarized in its financial statement.
6. the industry and comparable company data

However, this kind of information is usually really hard to gather when it comes to start-ups. When evaluating a start-up, it is crucial to analyse not the project's current financial condition, but its future status, taking into consideration all the risks involved in this venture. To better assess the value of a start-up, three factors must be considered:

4. paying attention to future forecasts rather than past data.
5. using probability to consider different scenarios.
6. understanding and paying attention to the start-up's specific business model rather than data on comparable companies in the market.

Traditional valuation methodologies

DCF method

According to the Discount Cash Flow (DCF) method, the value of a company depends on its prospective ability to generate stable operating cash flows (free cash flow), which offer a reasonable return on invested capital. In fact, according to the financial methodology, the value of the economic capital of a company is

equal to the value of the cash flows that it is expected to be able to generate, discounted using a discount rate that reflects the operating-financial risk profile of the investment.

This valuation method can be applied following the asset side approach or the equity side approach. The asset side approach provides a determination of the overall gross value of the firm (enterprise value) through the discounting of the future cash flows from the total invested capital, both debt, and equity. The equity side executes a direct determination of the economic value attributable solely to the equity (equity value) by discounting projected cash flows available to individuals who have invested in the company through equity.

In the asset side approach, the cash flows to be discounted are the free cash flows from operations (FCFOs), the discount rate is the weighted average cost of capital (WACC) and the value of equity is obtained by subtracting from the enterprise value the current value of the net financial position. In the equity side approach, the cash flow to be discounted are the free cash flows from equity (FCFEs), the value of the equity is obtained by discount the FCFEs at the cost equity computed with the capital asset pricing model (CAPM). These are the two formulas to compute the enterprise value using the equity and the asset side approaches:

Asset side: $EV = \sum_{i=1}^{n} \frac{FCFO_i}{(1+WACC)^i}$

Equity side: $Equity\ Value = \sum_{i=1}^{n} \frac{FCFE_i}{(1+K_e)^i}\ W_E = \sum_{i=1}^{n} \frac{FCFE_i}{(1+Ke)^i}$

These two values are linked by the following formula:

$$EV = Equity\ value + NFP$$

When using the DCF method analysts typically define a time horizon along which they determine the several free cash flows; usually, the time horizon ranges from 3 to 10 years. However, since the company is expected to operate also beyond the chosen time horizon, in order to obtain the value of the company it is necessary to take into account also the free cash flow the firm will be generating after the time horizon considered. For this reason, a terminal value is computed (TV). The terminal value can be computed in two ways, depending on the presence or not of growth.

With growth the formula is the following:

$$TV = FCF_n \times \frac{(1+g)}{(r-g)}$$

Without growth this is the formula:

$$TV = \frac{FCF_n}{r}$$

At this point the enterprise value can be computed with the following formula:

$$EV = \sum_{i=1}^{n} \frac{FCFO_i}{(1+r)^i} + \frac{TV}{(1+r)^n}$$

APV method

Adjusted Present Value (APV) is a variant of DCF which is particularly suited to the valuation of operations characterized by a large recourse to debt and by a structure debt and a financial structure which varies from year to year; the typical case is represented by leveraged buyout operations. The APV provides for the separate and analytical valuation of the tax benefits of the debt (tax shields), linked to the deductibility of interests payable. The enterprise value is given by the sum of two values: the unlevered enterprise value, calculated by discounting FCFOs not at the WACC but at an unlevered rate, which does not take into account the financial management, but only the operating management, as if it was a non-levered company, and the current value of the tax shields.

General formula of the APV:

$$EV = \sum_{i=1}^{n} \left[\left[\frac{FCFO_i}{(1+Keu)^i} \right] + \left[\frac{TV_{unlevered}}{(1+Keu)^n} \right] \right] + \sum_{i=1}^{n} \left[\frac{(D_i \times K_d \times t)}{(1+Ks)^i} + \frac{TV_{TS}}{(1+K_{TS})^n} \right]$$

The APV technique has the advantage of showing how different financial structures and financing instruments affect the business in terms of value by assessing the tax benefits of debt individually. However, a significant implicit weakness in this variation of the DCF is that it presupposes perfect knowledge of the debt amortization strategy.

Multiples method

It is a method based on the equality of the value of economic capital and the product of a market or income multiplier and a quantity expressing the economic value of the company's capital. The multiples method can be separated into two categories based on the equity approach to valuation and the entity approach to valuation criteria. The first approach is a direct and instantaneous assessment of the value of the equity, whereas the second is an indirect estimate based on the difference between the business value and the market value of the financial debts. In practice, the two approaches entail that it is possible to discriminate between two categories: equity side and asset side. The distinction is solely determined by the value specified in the multiple's

numerator. The distinction is solely determined by the value specified in the multiple's numerator. The numerator in the first example (equity side) is the stock market price of the shares or the "stock market capitalization," which is the current value of the equity; these are known as equity multiples. The numerator in the second scenario (asset side) is the investment in gross assets, which is typically defined as the sum of market capitalization and net financial debt. In this second example, the numerator is denoted by the sign EV (Enterprise Value). These multiples are known as enterprise value multiples. The multiples can be distinguished by the quantities expressed in the denominator. These are essentially either performance measures, meaning periodic results, or other values, either accounting-related or not. The methodology operates by constructing a series of relationships between the actual prices of comparable companies' securities and certain accounting elements in order to identify the relationship that links the value of the companies to specific company variables identified as the company's value drivers.

Alternative methods for start-ups' valuation

While the methodologies previously explained are the most used when it comes to traditional companies' valuation, they do not really work for start-ups. The main issue related to the use of these methods for start-ups is the information needed to correctly and effectively apply them. When adopting the DCF method (and its variant, the APV method) to value start-ups there are several issues to be considered. Firstly, for start-ups the computation of the terminal value is of paramount importance because it can represent more than 4/5 of the total value of the company but its definition gets extremely complicated since it is impossible to coherently define the following elements: if, when and how the start-up will grow. Secondly, defining the discount rate for young companies is complicated. This technique is difficult to adopt with newly formed companies because multiples are typically dependent on earnings or revenues, which are sometimes negative in start-ups as they normally record losses instead of profits, and at the beginning, revenues are very low. Furthermore, it is nearly impossible to find comparable data in the market because each organization has unique and non-replicable characteristics and finding data about young companies on the market is harder than finding data for mature companies. For these reasons, alternative methodologies for valuing start-ups have been created.

Chapter 3 - Airbnb case

Company history and overview

Airbnb is an online platform that connects people looking for short-term rents, named guests, and people looking to rent their extra space, called hosts. Airbnb was born in 2007 from the need of two young students of design, Brian Chesky and Joe Gebbia, to pay the rent of their San Francisco apartment. The idea came when it was the time of an international design conference in San Francisco and every hotel was sold out. A website called AirBedandBreakfast.com was created by the two guys to get attendees to the conference to rent airbeds in their apartment and three designers accept their offer and became their first guests. In 2008 Nathan Blecharczyk, an expert in coding, joined the project of Chesky and Gebbia bringing technical skills and

expertise and altogether created Airbed & Breakfast. At a certain point they successfully applied for a spot at YC, a start-up accelerator that in return for a chunk of equity provided them with a small amount of cash, weekly access to YC's founder Paul Graham and his partners, and instructions to YC's network of alumni and friendly investors. Over the following years, they were able to make Airbnb grow dramatically; in June 2012 Airbnb counted 10 million bookings and raised $1 billion at a valuation of $30 billion in 2016. Over time, as the platform was growing, the rent options offered were not just private rooms but also entire apartments, villas, boats, treehouses, private islands, and other types of accommodation. In 2016 Airbnb launched "Experiences", which are in-person activities organized by local experts that go beyond traditional tours or classes, fully engaging participants in the world of the host, and in 2020 to help hosts make up for lost earnings during the pandemic they also launched "Online experiences". After numerous rumours on the 16th of November 2020, Airbnb filed the prospectus, declaring its aim to go public. In 2021 the company recorded 6 million active listings worldwide, 100 thousand cities and towns with Airbnb active listings, more than 220 countries and regions with its listings, and more than 4 million hosts on its platform.

Airbnb business model

Value proposition

it is possible to distinguish between a value proposition for the hosts and another for guests. Firstly, Airbnb provides guests with a wide variety of choice since all the accommodations are different from each other and they can choose among private rooms, entire apartments, castles, private islands, and many other kinds of accommodation. Airbnb also provides guests with cheaper accommodation solutions if compared with similar hotel rooms; if not cheaper, Airbnb's solutions are more valuable in terms of price/quality ratio because by offering additional services (kitchen, coffee machine, washing machine, etc.) guests have the chance of saving money during their stay. Finally, thanks to Airbnb guests can have a unique experience and feel more like a local, thanks also to the "Experiences" provided by the platform. On the hosts' side, Airbnb gives them the possibility to generate income from their extra space and this makes the platform truly attractive for them. In addition, Airbnb helps hosts minimize the risks associated with renting for short periods to strangers, such as damage and robbery risks, by providing insurance, setting house rules that need guests' compliance before booking, and several other solutions. Furthermore, Airbnb strives to make it as easiest as possible for hosts to join the platform by providing them with help through the process. Finally, Airbnb puts a lot of effort not only to make it easy for hosts to join the platform but also to manage the reservations providing them with a sort of management system with several features such as: listing details, photos, price setting, availability calendar, and others.

Key partners

First of all, for Airbnb the key partners are guests and hosts since they represent the active users of the platform. In fact, without accommodations Airbnb would be unable to deliver value to guests. Truth to be told, also the opposite is true. Without guests there is no advantage for hosts to join the platform and list their accommodation on it. Other key partners for Airbnb are tourism partners and communities with which it partners to make platforms more attractive to guests. Other important partners are technology firms on the non-competitive advantage parts of their technology such as preferred/additional software partners and other firms that help Airbnb with maps, payment systems, cloud storage, identification, and many other technologies which are also used by other companies operating in the online travel industry. Of course, in the key partners' category, also investors and venture capitalists, as well as commercial partners, must be included.

Key activities

When looking at Airbnb's business model, there are several activities that can be considered extremely important for its business model to work well. First of all, Airbnb needs to achieve and retain consistency. Secondly, because as a two-sided platform Airbnb sees network effects as an extraordinary source of competitive advantage, it is correct to state that another fundamental activity for Airbnb is to grow the network effects. Thirdly, Airbnb must focus on the complementary offer besides the accommodation as it did with the launch of the "Experiences" in order to make the platform more interesting and valuable for both sides. Finally, Finally, for Airbnb, it is also very important to come up with new solutions and ideas to improve existing value propositions and create new ones.

Key resources

Airbnb can be defined as a light asset business since it is a platform, and it does not own the accommodations that are listed on the platform. Thus, among its key assets, it is not possible to include the accommodations themselves. However, the value created by Airbnb still comes from the number, the quality, and the variety of accommodations that are available on the platform for guests. For this reason, one of the key resources for Airbnb is represented by active hosts, who deliver great customer experiences to their guests. Airbnb in order to be valuable needs to see both sides of the platform as active users, the more active users there are, the greater the value delivered by the platform. Hence, without active guests, the platform itself is useless for hosts and this makes active guests a fundamental resource for Airbnb. All that said certifies the paramount importance for such a business of the network effects. There are also other key assets for Airbnb: the brand as it helps guests and hosts trust the platform; data is another important resource for the platform in order to gather information and deliver a better service; algorithms, technologies, analytics capabilities, skilled engineers are all valuable resources for an online platform such as Airbnb.

Customer segments

Airbnb's customers are divided into two categories: guests and hosts. For Airbnb's guests, customer segmentation can be done in several ways. It can be a behavioural segmentation, meaning that customers can be divided into various segments depending on the reasons why they travel and consequently the kind of trip they do such as business travel, leisure travel, a travel to meet family or friends and so on. The behavioural segmentation also refers to the kind of accommodation guests are looking for. Guests may be segmented also depending on the reason why they prefer to use Airbnb rather than other solutions and on the type of activities they are interested in once on a trip. On the other side, hosts can be segmented by the type of accommodation they provide. They can be segmented by the type of guests their accommodations are thought for. Another customer segmentation criterion for hosts can be the reason why they join the platform. Other segmentation criteria might be the experiences they provide guests with.

Channels

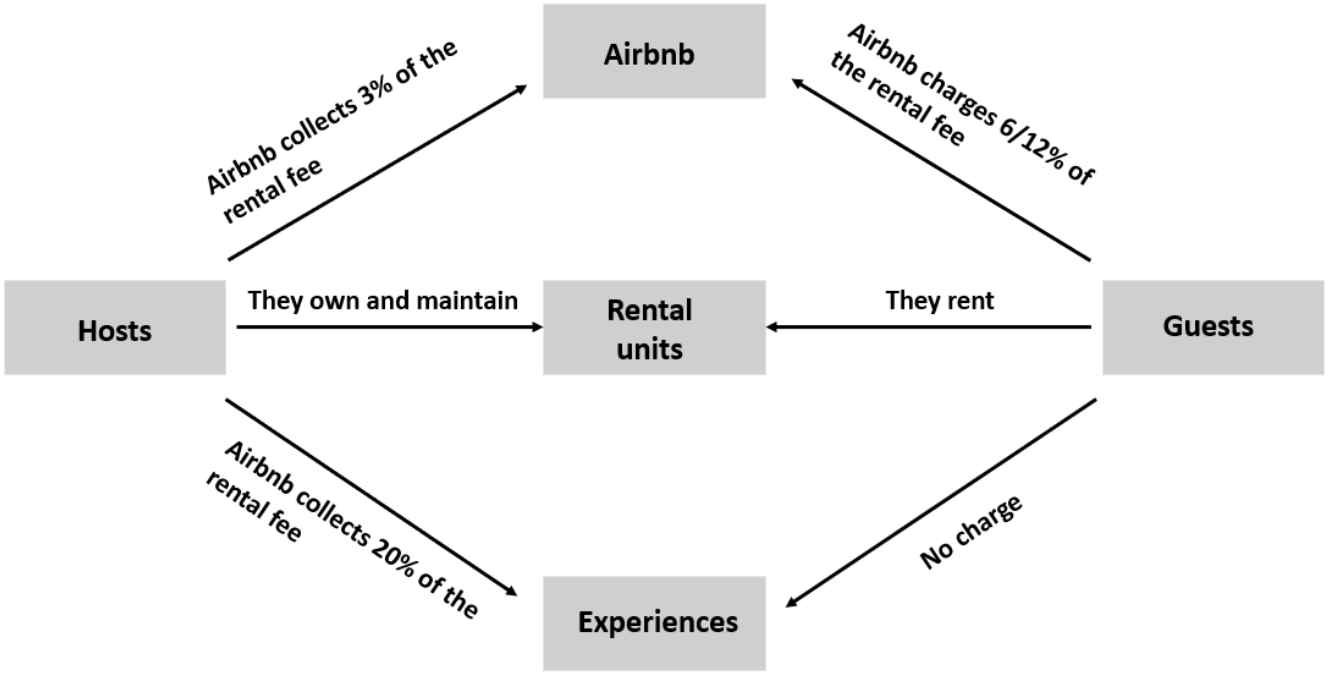
When it comes to the channels used by Airbnb, we can divide them into two categories: marketing and sales channels and transaction channels. The former includes several channels such as: word of mouth that can be very effective in helping potential users, both guests and hosts, to overcome their scepticism regarding the platform; social media, and digital ad campaigns. The latter refers to the website where it is possible to conclude the transactions but also the app that Airbnb launched in 2010.

Customer relationships

Regarding its relationship with hosts and guests Airbnb needs to manage it carefully, striving to ensure safety and high quality of the service provided. In addition, Airbnb needs to keep on delivering value to both parties and to possibly increase it and improve its services. Airbnb must manage the relationship with its active users also for avoiding being at odds with local communities. In fact, Airbnb needs make sure that the guests of the accommodations listed on its platform do not behave in a way that may cause problems to the neighbours, as guests might behave differently form how they behave when they are not on a trip. Moreover, Airbnb has to be careful with governments since its way of doing business may be against the regulation of the countries its hosts' accommodations are located in.

Revenue structure

Airbnb's revenue model is summarised in the figure below:



On top of this model, Airbnb has recently developed a new revenue model that is exclusive for those that are classified as professional hosts, who are those that use the platform to run a business. In this case, no fee to guests is charged but Airbnb makes hosts pay fee between 14% and 16% on the amount due for the accommodation.

Cost structure

When it comes to the cost structure, it is possible to say that Airbnb has several costs. The several cost categories are the following: cost of revenue, operational and support costs, product and development costs, sales and marketing costs, general and administrative expenses, financial expenses and restructuring charges.

Results

From the comparison between the share price computed with the DCF method and the closing price of the first day of trading, it is possible to conclude that the share price of Airbnb is not justified by its fundamentals. Airbnb share price is probably driven by very positive expectations of investors. In fact, as it was noticed with the sensitivity analysis, a share price of $145,07 which is very similar to the closing price of the first day of trading is expected with a GBV of $50 bn and with a growth rate of the total operating expenses/ revenue of –2,5%. This could mean that investors might have expected Airbnb to recover very soon from Covid-19 and almost to get back to the performance standards recorded before the breakdown of the pandemic and they might also have expected the company to have higher operating margins in the future years. In addition, Airbnb's share price might also have been driven by the expansionary monetary policies implemented in response to Covid-19.

Multiples method

While using the multiple method, the following reasoning was applied: multiples were computed considering in one case only the US based hotel chains, in a second case considering only the online travel booking companies and in a third case considering the two groups of firms all together. Airbnb has negative net income and EBIT and for this reason these values were not considered for the multiples method. Taking into consideration only the US based hotel chains, the only two multiples computed were EV/Sales and P/Sales. In this case the share price of Airbnb considering the average EV/Sales multiple is equal to $57,10 whereas using the average P/Sales multiple it equals $44,20. On the other hand, when looking at the online travel agencies also another multiple was taken into account since it refers to a metrics that is common to the three companies, that is the EV/GBV ratio. In this case the share price of Airbnb considering the average EV/GBV multiple is equal to $34,15 whereas looking at the average of EV/Sales and P/Sales multiples it is respectively $29,97 and $24,86. In the last case, when the two groups of companies were considered together (Table 14), the multiples used were only the EV/Sales and the P/Sales as they are common to both the sets of companies. Using the average EV/Sales the share price is equal to $48,06 whereas considering the average P/Sales it is $37,76. Since the initial offering price at IPO was $68 which means a valuation of nearly $47 billion and taking into consideration that at the end of the first day of trading Airbnb closed at a share price of $144,71, the results obtained with the multiples method in all the three cases make it clear that Airbnb was overvalued in comparison with its comparable firms.

Conclusion

The purpose of this thesis was to understand if the share price of Airbnb, both at the moment of its IPO and on its first day of trading, was justified by the company's fundamentals.

Before performing an independent financial valuation of Airbnb by applying the DCF and multiples methods, an overview of what a start-up is, was provided. In particular, the main exit ways for start-ups were briefly discussed, highlighting the main trends of the last years regarding start-ups' exits.

In the second chapter of this thesis, a theoretical explanation of the DCF and multiples methodologies was given to highlight the most important features of the methods used to evaluate Airbnb. In this chapter, also the most used methodologies ad hoc created for performing financial valuations of start-ups were presented, even though they were not used to perform the valuation of Airbnb. These methodologies were not applied for the Airbnb case, as there was enough information about the company and its financial history to allow the use of the DCF and multiples methodologies, which are the most applied methods in practice. However, they were presented to make it clear the particularity of start-ups when it comes to evaluating them from a financial point of view.

In the third chapter, the history of the company was presented, from the very beginning to the IPO. In addition, the business model of Airbnb was discussed in a detailed way by using the Business Model Canvas tool.

After that, the assumptions and the reasoning made for applying the DCF and multiples methods were explained in a detailed way, to justify the results obtained. From the methodologies used, it was possible to conclude that Airbnb's share price was not justified by its fundamentals. Rather, the company's share price might have been driven by the very positive investors' expectations about the firm's performance, the irrational behaviour of investors that is typically common in the IPOs of well-known and highly hyped companies, and the expansionary monetary policies implemented in response to Covid-19.

The analysis implemented provides a clear explanation of how the DCF and multiples methodologies can be applied in a practical way to evaluate investment opportunities. The limitations of this work are related to the assumptions made to estimate the future values useful for the application of the DCF method and to the reasoning elaborated to choose the set of comparable firms of Airbnb for the application of the multiples method. However, it is also true that financial valuation can be considered more as an art rather than a precise science, as the results are strongly affected by the assumptions made for applying the several methodologies.

This thesis still provides a solid reference point for the application of the DCF and multiples methodologies for start-ups that have reached a very late stage in their lifecycle as it was the case of Airbnb.