



UNIVERSITA' DEGLI STUDI DI PADOVA
DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI
"M.FANNO"

CORSO DI LAUREA MAGISTRALE IN
BUSINESS ADMINISTRATION

TESI DI LAUREA

UNDERPRICING AND DIRECT PUBLIC OFFERINGS:
THE SPOTIFY DIRECT LISTING CASE

RELATORE:

CH.MA PROF.SSA ELENA SAPIENZA

LAUREANDA: SILVIA BRUSON

MATRICOLA N. 1179585

ANNO ACCADEMICO 2018 – 2019

Il candidato dichiara che il presente lavoro è originale e non è già stato sottoposto, in tutto o in parte, per il conseguimento di un titolo accademico in altre Università italiane o straniere.

Il candidato dichiara altresì che tutti i materiali utilizzati durante la preparazione dell'elaborato sono stati indicati nel testo e nella sezione "Riferimenti bibliografici" e che le eventuali citazioni testuali sono individuabili attraverso l'esplicito richiamo alla pubblicazione originale.

The candidate declares that the present work is original and has not already been submitted, totally or in part, for the purposes of attaining an academic degree in other Italian or foreign universities. The candidate also declares that all the materials used during the preparation of the thesis have been explicitly indicated in the text and in the section "Bibliographical references" and that any textual citations can be identified through an explicit reference to the original publication.

Firma dello studente

TABLE OF CONTENTS

INTRODUCTION	3
CHAPTER 1 - THE LISTING PROCESS	6
1.1 - THE CHOICE OF GOING PUBLIC.....	6
1.2 - THE TRADITIONAL UNDERWRITTEN IPO PROCESS	8
1.3 - AN UNORTHODOX WAY TO LIST: THE DPO PROCESS	23
CHAPTER 2 - IPO UNDERPRICING: A LITERATURE REVIEW	33
2.1 - ASYMMETRIC INFORMATION THEORIES.....	34
2.2 - OWNERSHIP DISPERSION THEORIES	44
2.3 - INSTITUTIONAL THEORIES	46
2.4 - BEHAVIOURAL THEORIES	49
2.5 - FACTORS AFFECTING THE LEVEL OF UNDERPRICING	53
CHAPTER 3 - IPO UNDERPRICING: AN EMPIRICAL REVIEW	60
3.1 - UNDERPRICING MEASUREMENT	61
3.2 - UNDERPRICING AND INTERNET-RELATED FIRMS	64
3.3 - UNDERPRICING ARISING FROM PRINCIPAL-AGENT ASYMMETRIES	70
3.4 - UNDERPRICING RELATED TO SHARES ALLOCATION	73
3.5 - UNDERPRICING RELATED TO PRICE SETTING MECHANISM	80
CHAPTER 4 - THE SPOTIFY DPO CASE	87
4.1 - COMPANY'S HISTORICAL OVERVIEW	88
4.2 - SPOTIFY'S DIRECT LISTING PROCESS.....	99
4.3 - CONTEMPORARY INTERNET-RELATED IPOs	107
4.4 - THE VALUATION OF SPOTIFY	115
4.5 - SPOTIFY'S DPO SUGGESTIONS	124
CONCLUSION	130
APPENDICES	134
REFERENCES	141

INTRODUCTION

Going public is one of the most important decisions in the life of a company. It provides the possibility to raise new financial resources, immediately available to finance firms' growth plans and to rebalance their capital structure. It offers the existing shareholders the opportunity to monetize part of their investments in the firm by exploiting the public offering as an exit strategy. It also enhances the reputation of the listing company both in the business and in the financial communities. Nevertheless, the process of going public is not costless. The transition from private to publicly traded entity generally implies several changes in the organizational structure of a firm, as the loss of management control, the increase in the disclosure requirements and the pressure from regulatory oversights. However, the most suffered costs by issuing companies are usually those directly related to the process of listing, paid in the form of fees. On the contrary, the major indirect cost of going public, shares underpricing, is frequently neglected.

A broad empirical literature evidences indeed that when firms undertake initial public offerings, the price of the offered shares tend to jump substantially during the first day of trading. This systematic price increase on the stock exchange, with respect to the price at which shares are initially offered to investors, is therefore referred to as "underpricing". Underpricing represents an opportunity cost for firms going public since, issuers selling shares at an offer price lower than their potential market value, are "leaving money on the table" and are diluting even more pre-issue shareholders' ownership. In practice, it appears as a wealth transfer from the pocket of issuing firm and pre-issue shareholders to initial investors. The firsts to analyse this robust phenomenon were Reilly (1973) and Ibbotson (1975). Over the subsequent years, numerous researchers have tried to understand and explain its causes, thus developing a wide set of theories around the issue. The most relevant theories are based on asymmetric information, asserting that underpricing is caused by information frictions among the three main parties involved in the listing process: the issuer, the underwriter and the investors. Other groups of theories are then institutional theories, claiming that underpricing is used by issuing firm in order to insure against legal liability and reputation damage, and ownership and control theories, arguing that issuing firm's managers voluntary underprice offered shares in order to obtain certain advantages in terms of ownership and control. The most recent theories are finally those which identify underpricing causes in the behavioural biases of the agents involved in the listing process, hence called behavioural theories. Additionally, other studies have focused on

specific factors affecting the level of underpricing, such as issue's, firm's and economy's variables.

In order to mitigate part of the direct and indirect costs associated with the listing process, in the last years, two important technology companies have decided to go public on the major stock exchanges through a very atypical mechanism: the direct public offering, alternatively known as direct listing. Direct public offerings present two fundamental differences with respect to traditional initial public offerings: they only provide for the listing of existing shares and they do not involve investment banks in the role of underwriters. Direct public offerings are indeed widely discussed because they downsize investment banks importance in the overall process of going public, therefore cutting fees paid by listing companies. The first company that chose to go public using a direct listing, in alternative to a traditional initial public offering, was Spotify Technology. The Swedish global leader of the music streaming listed part of its existing shares on the New York Stock Exchange on April 3, 2018, after having received the approval from the Securities and Exchange Commission. One year later, on June 20, 2019, also Slack Technologies, an American software firm, decided to go public on the NYSE via direct listing.

The aim of this dissertation is not to merely illustrate the direct public offerings in order to appraise their advisability over the traditional listing procedure. The primary research objective is, instead, to understand if underpricing is a consistent phenomenon also in offerings characterized by no underwriting agreement and by a limited engagement of investment banks in the pricing and allocation phase. For timing reasons, the empirical analysis will be focused on the case of Spotify. In order to answer the question, it will be first necessary to acquire a deep understanding of the company's business model, financial results and competitive framework; only afterwards it will be possible to detail Spotify's direct public offering so to carefully evaluate each party's contribution to the structuring of the process and to assess if a sort of shares underpricing could be observed as well. If this first part of the analysis leads indeed to some affirmative outcomes in terms of underpricing, then it will be worth to examine company's valuation at the time of listing and to measure the extent of Spotify's mispricing in comparison to similar traditional offerings, so to clarify the role actually played by investment banks in determining the degree of underpricing.

The thesis is organized as follows. Chapter 1 offers an overview of IPOs and DPOs, describing for each of them the main steps, the different pricing mechanisms and the services provided by underwriters; it also summarizes the advantages of going public and all the costs that issuing firms must incur for both the listing methodologies.

Chapter 2 introduces a literature review of the underpricing phenomenon and reports which are, according to past empirical researches, the variables that mostly affect the level of IPO underpricing.

Chapter 3 reports the most relevant empirical findings about the relation between underpricing and underwriters, by analysing and comparing various offerings undertaken through different pricing mechanisms, underwriting and allocation procedures; it represents a basis to then contextualize the case study, also providing evidence about underpricing for technology and Internet-related companies.

Chapter 4 presents the case of Spotify DPO: after an analysis of the company's business model, economic and market performance, future risks and opportunities, and after a detailed description of its listing process, the supposed level of underpricing is compared to the findings deriving from an empirical research conducted on contemporary IPOs; in the final part of the chapter, following a valuation analysis on the company's fundamental value using DCF and Multiples methodologies, it is discussed the main suggestions drawn by the case.

CHAPTER 1 - THE LISTING PROCESS

An initial public offering is the first sale of a privately held company's shares to the public and the listing of these shares on a stock exchange. For firms that choose to go public, the transition to the equity market represents a milestone in their everyday life, bearing enriching but also complex and time-consuming changes. As Draho (2004, p.1) highlights "few events in the life of a company are as great in magnitude and consequence as initial public offering (IPO)". Indeed, the decision to go public not only must involve a thorough analysis of the initial benefits and costs – like the burden of the disclosure and compliance requirements – but it must consider also all difficulties that could arise after the effective listing. An IPO entails in fact substantial changes in the organizational structure of a firm: different legal and economic structure, loss of management's control, increase in information disclosure requirements and stricter regulatory oversight.

The success of an IPO strictly depends on an accurate pre-evaluation of all the possible scenarios which could realize along the process: before starting such an experience is fundamental for a firm to be fully aware about the available planning alternatives, about the subjects and entities involved in each phase, about their roles, responsibilities and implications in the overall process, so to minimize any possible risks and to maximize the final outcome.

This chapter will try to deeply analyse all these aspects from the listing company's point of view. The aforementioned issues will be divided into the two listing processes that will be compared along the whole elaboration, in order to have a full understanding of how they work before going to discuss them in terms of underpricing in the next chapters: the traditional initial public offering, the IPO, and the direct public offering, the DPO.

1.1 - THE CHOICE OF GOING PUBLIC

Disregarding the type of process chosen to go public, when starting to think about a possible listing, a private firm has always to ask which the benefits of going public could be. There are various and several answers to this question.

First of all, as stated by Iannotta (2010), the most important reason to go public is probably cash. From the firm's perspective, the new capital infusion obtained through the stock market offers a good alternative way to support the expansion of the company's operations, to enhance the research and development, to finance new projects, or simply, to improve the company's

financial structure. Through IPOs in fact, companies are able to raise new equity necessary to fund their growth without creating any further debt. From shareholders' perspective too, liquidity is a key factor in the going public decision. For instance, the IPO of a firm could be a valuable strategy to deal with the succession of the first entrepreneurial generation, if a second is not available or willing to manage the firm (Iannotta, 2010). More in general, it can be affirmed that the shares listing is a liquidity event that permits founders and pre-IPO investors to monetize part of their investment or to completely cash out their position using the IPO as an exit strategy, especially in the case of private equity funds. This is further supported by Zingales (1995, p.425), who states that "IPO is also an important channel through which an entrepreneur or venture capitalist gets rewarded for his initial effort." In going public indeed, entrepreneurs try to optimize the structure of their ownership in the company so to maximize the total proceeds from an eventual sale, and to use the IPO to facilitate the acquisition of the company for higher values than what they would get by bargaining in a trade sale.

Besides that, there are other meaningful non-cash benefits from an IPO, especially for the firm itself. First, when companies are pursuing strategies of external growth through mergers and acquisitions, IPOs allow them to enhance payment alternatives: once a company is public, it can in fact acquire other businesses by paying with its own listed stocks rather than using only cash; in this case indeed, a public valuation is available, and, most importantly, the shares can be liquidated in any moment (Iannotta, 2010). Publicly tradable shares are clearly more attractive for target shareholders than illiquid private company stock.

Second, a firm can obtain several advantages from the better image and reputation associated to the stock exchange listing. Thanks to the transparency in terms of financial and economic situation required by the listing parameters, public companies have easier access to debt market compared to private firms; furthermore, the continue information disclosure guarantees listed companies much more visibility towards stakeholders; as sustained by Geddes (2003) then, public companies are able to attract and to hire more qualified managers and employees because of the relevance and prestige tied to them. Finally, thanks to the better consideration in terms of strength and stability, listed firms can gain easier relationships with customers and suppliers.

Third, IPOs also provide some enhanced benefits for current employees. Stock options and other similar performance-based compensation incentives align employees' interests with those of the company: by allowing them to benefit alongside the company's financial success, these programs increase productivity and loyalty to the firm. Management compensation solutions in particular – which are only possible if a company is listed – give management the right incentive and motivation to run the firm in the best way.

1.2 - THE TRADITIONAL UNDERWRITTEN IPO PROCESS

The process of planning and executing a traditional IPO is highly articulated and time-consuming: while it typically takes 14 to 16 weeks to close, the exact time taken can widely vary, depending on market conditions, complexity of the transaction, company's readiness prior to the IPO process and many other factors. In this timeframe a company must choose the stock exchange in which to list its shares, decide how to offer them, perform various due diligence activities in order to provide the regulatory authority with the proper information and documentation requested, undertake some marketing actions and manage the relationship with prospective investors. Therefore, the complexity of the IPO process usually requires the support of a large team of professionals, including the company itself, the legal counsel, auditors and investment bank, among others. The latest, in particular, retains a primary importance in the overall IPO process, and it normally plays the role of underwriter: offering its underwriting services to the future listed company, the investment bank actually purchases securities – in the case of an IPO, stocks – from the issuer and then resales them to the market (Iannotta, 2010). It structures the transaction by verifying business and financial data, performs the due diligence and most importantly, prices the securities offered; as it will be further explained in the following paragraphs, the centrality of the investment bank in the IPO process derives indeed from its deep influence in the price-setting mechanism, being the price a crucial variable of any offering. Its functions can be briefly summarized as follows:

- information, as it determines the market's interest in the offering;
- certification, as it certifies the quality of the deal and of the securities been issued, since the reputation of an investment bank is damaged if involved in mispriced (not good) IPOs;
- research, as it provides aftermarket analyst coverage, increasing trading activities and liquidity;
- market making, as it guarantees the ongoing trading of the issued securities.

The presence of the investment bank in the IPO process is therefore strictly related to a matter of information asymmetry between issuing firm and investors. As Iannotta (2010, p.6) indeed argues “if a firm were able to credibly approach the financial markets and market its own [...] stocks without any third party “certifying” the quality of its securities, investment banks would not exist”. A detail review of the common IPO phases will be provided in the following paragraphs, trying to stress – giving its cruciality – how they result traditionally driven by the investment bank in the role of underwriter.

The selection of the underwriter

As anticipated, an IPO process is highly complex in terms of relationships and documentation to be provided; for this reason, it requires the management of a company to have a detailed knowledge about the stock exchange and the mechanisms behind it. Since, in general, a firm's management has never dealt with an IPO process before, an investment bank can therefore offer the possibility to exploit its competences in the stock market and its network of contacts among different investors, so to speed up the overall process and to increase the firm's visibility. Investment banks usually manage a lot of aspects of an initial public offering: performing a due diligence about financial soundness and satisfaction of capital requirements, they assist the company in shaping its investment thesis to be then used during the marketing phase; while preparing the registration statement and the prospectus, they guide the company in the presentation to investors; they underwrite the stocks, assuming part of the risk associated with the issue; they develop strong price recommendations and allocate shares to investors, selling in this way company's stocks to the public.

Given the importance of the services and advice provided throughout the process as well as the messages its involvement in an IPO signal to other advisors and to the market, a company should carefully consider the qualifications and the skills of the investment bank it hires. The selection of the underwriter is made among several investment banks that are ranked using some quantifiable criteria as the total IPO proceeds and their market share. According to Dealogic global IPOs bookrunner ranking¹, the most important investment banks for 2019 in terms of value and number of followed IPOs are Goldman Sachs, Citigroup, Merrill Lynch, Morgan Stanley and JPMorgan. Having in mind this ranking, firms then start the selection of the investment bank with a beauty contest (also known as "bake-off"), in which each participating bank makes a formal presentation to the board of directors, trying to emphasize their expertise in the IPO process, showing their recent relevant IPOs, the post-IPO price performance of the companies they have taken public and their preliminary views on the market value of the company (Bagley and Dauchy, 2012). However, as underlined by Fernando, Gatchev and Spindt (2005) in their paper about the way in which firms and underwriters choose each other, is worth to point out that "issuers and underwriters associate by mutual choice": during the "bake-off" meetings in fact, as issuers look to the abilities of prospective underwriters to certify, promote, and allocate their shares, similarly underwriters look to the issuer's characteristics relative to other possible issuers; factors like the issue size, the likelihood that the offer will be

¹ Available at <https://www.dealogic.com/platform/investment-banking-capital-markets/> [access date: 10/08/2019].

completed, or even the probability that the issuer will remain in the business and issue further shares in the future, will indeed affect underwriters' short-term and long-term profits. So, "underwriting contracts are executed between those issuers and underwriters who mutually agree that their interests coincide" (Fernando, Gatchev and Spindt, 2005, p.2438). It follows that, in general, higher quality firms tend to associate with underwriters characterized by a higher ability, while lower quality firms associate with lower ability underwriters. Having clarified that, from the issuer firm's perspective, the evaluation of the candidates is made combining different criteria: cost minimization (as underpricing and compensation), reputation of the bank's analysts, level of information that the bank has collected about the firm and about the potential investors' interest, and additional services provided besides the underwriting one are all aspects taken into consideration. The choice of a specific underwriter is then externalized by the firm by sending a letter of intent to the chosen bank.

Although the whole IPO is primarily managed by a single investment bank, more banks are usually involved in the process, so to form a syndicate. The issuing firm normally selects a lead bookrunner, that plays the critical role of advising the company on all aspects of the IPO process, assists the company in marketing the transaction and guides the firm in its dealings with investors. Being responsible for the due-diligence, roadshow, bookbuilding and allocation of the shares, it also gets the largest portion of fees. In consultation with the firm, the lead bookrunner then forms a syndicate of banks that assists in the pricing, underwriting and distribution of the offering. Inside the syndicate it is possible to distinguish three main parts. The first part is the managing group, composed by the lead bookrunner and the joint bookrunners, that are chosen based on their relationship with the company, industry expertise, research analyst capabilities and market-making ability. They work closely in order to draft the registration statement, craft the marketing materials, create the roadshow schedule, and support the stock in the aftermarket. The second group of the syndicate also comprehends non-managing underwriters (called "managers"), that are less involved in the day-to-day advisory for which the bookrunners are responsible for, but that have the role of underwriting an additional portion of shares following bookrunners' suggestion. Finally, there are some selling banks (known as "co-managers"), that mainly guarantee the allocation of the shares, providing additional research coverage and assisting the market making once the stock is public (Iannotta, 2010). The company's choice of the lead bookrunner becomes therefore of fundamental importance, if considered its consequence in determining the other investment banks participating in the IPO process.

Once concluded the selection of the main underwriter and of the whole syndicate of banks – if any – the contract between the issuer and the investment bank is formalized through an underwriting agreement, which can be shaped in three different ways:

1. The first form of this contract is the “firm commitment”, in which the underwriter guarantees to purchase all the shares issued at the agreed price and to absorb eventual loss in case of unsold shares; for the issuer, it is the safest but the most expensive type of contract.
2. The second form is the so called “best effort” contract, in which the underwriter tries to sell as many shares as possible but does not guarantee the proceeds to the issuer; of course an underwriter who considers the issue quite risky may prefer this type of agreement to shift the risk to the company.
3. The third form is the “all-or-non” contract, that can be considered a modification of the best-effort alternative: in this case, if the entire offering is not sold, the underwriter agrees to cancel the issue.

The due diligence phase

In a traditional underwritten initial public offering, once decided for the investment bank that will lead the whole process, the first week is characterized by several organizational meetings among the management of the firm and all the key members of the IPO working group, usually held at the company’s headquarters, in order to clearly define timing, key tasks and responsibilities for the IPO and to understand as much as possible about the issuer’s relevant aspects.

From this information-gathering phase onwards, the bank chosen as lead bookrunner, together with other banks of the managing group of the syndicate – if any – starts the so called due diligence phase, which can be broadly referred to as “the process of verifying that the information in the prospectus and the registration statement is materially complete and accurate” (NYSE, 2013, p.38). As it is therefore possible to infer from this definition, the due diligence activity is strictly connected to the drafting of the registration statement and, in particular, of the prospectus, whose contents and aims will be later presented in this paragraph. So, in addition to ensure the accuracy, completeness and truthfulness of the company’s registration statement, which is fundamental for the issuer in order to build confidence among potential investors, due diligence has actually the purpose of limiting the risk of liabilities: in case of material misstatements or omissions in the offering disclosures, it provides underwriters

and directors of the company with due diligence defence². Both parties indeed have important reputational interests in the soundness of the company's business plan and associated risks presented in the disclosure documents. In this sense, due diligence also helps identifying business issues that need to be addressed before the listing becomes effective.

Due diligence investigation performed by the managing group of banks basically consists in a collaborative and iterative process with the firm, which takes the form of company's inspections, meetings, interviews, questions and answers sessions with directors and managers of the firm. The inspected aspects of the firm during this phase are numerous and interconnected, but for organizational purposes, two kinds of due diligence can be identified. First, banks conduct business and financial due diligence, focusing primarily on the company's operations, procedures, historical and prospective financials, firm's capital structure, competitive position and business strategy, as well as on management team and key board members in order to assess their qualification and experience in running the firm. As part of this procedure, managing underwriters also review any agreement the company signed with customers, suppliers and creditors, and – if necessary – undertake interviews and discussions with these parties. Second, legal and accounting due diligence is performed: this type of investigation verifies company's legal records, the accounts ledgers and material contracts, and wants to analyse any litigation and compliance with laws and regulations. Of course, in conducting all these activities, investments banks are supported by lawyers, accountants and any other helpful external consultants.

As anticipated before, the outcome of the whole due diligence activity is the preparation of the prospectus. "The prospectus is, legally, the only publication that investors should use in order to make an investment decision to buy shares [...] in an IPO" (Espinasse, 2014, p.102). In other words, it is the central document used to market an initial public offering to potential investors. All the information gathered during the due diligence phase is used to draft a preliminary prospectus, that in the U.S. is called "red herring", since it has a legal disclaimer printed in red in its front page, stating that the securities are not yet offered. In fact, the content of this initial document is usually not complete and subject to further changes. The prospectus must include information about the firm's business (like products and services, distribution channels, or intellectual property); audited financial statements and even unaudited interim financial statements; firm's strengths, strategy and competitive environment; potential risk factors that

² In many jurisdictions, other liable parties in case of material misstatements and/or omissions in the prospectus and in the registration statement are the officers who sign the registration statement, the company's auditors, and any selling shareholders.

may affect future performance of the company; quality and experience of the management; use of the proceeds from the IPO (for growth, debt reduction, or acquisition of other businesses for instance); information about the main shareholders and even about the investment bank chosen as underwriter. As stated by Iannotta (2010, p.53) “the prospectus provides full disclosure of a firm’s business and it is a key marketing and protection tool for retail investors”. A simplified version of the document, called “offering circular” is instead addressed to institutional investors. The final prospectus then includes additional detailed information about the issue, as the number of shares offered and the final offering price, the dilution resulting from the offering, underwriting agreements and any selling shareholders.

This final document must also be ultimately approved by the market authority (i.e. by the SEC, “Securities and Exchange Commission”, in the U.S.). In the U.S. indeed, the final prospectus constitutes the Part I of the registration statement, a document in the company’s responsibility which is filed with the SEC for the registration of the initial public offering. The amount and the type of information there included must be conformed to SEC rules. Generally, domestic companies submit the registration statement on Form S-1 (or Form F-1 if foreign private issuers) which is composed, besides the prospectus, by Part II: in this section several data and documents are required, such as employment arrangements, a list of subsidiaries, joint ventures and license agreements, acquisitions or contracts with customers and suppliers. For this reason, smaller issuers can use other registration forms that require less specific information and a less complex procedure to register their offerings. Once received the registration statement, the SEC must verify its conformance to disclosure requirements: the SEC takes approximately 30 days to complete its initial review of the first version of the registration statement and usually requires at least three amendments of the document before the approval; anyway, it can always refuse to make the registration statement effective if some documents are incomplete or are missing. After the approval of the prospectus and all the other documents, the registration statement becomes effective, allowing the company to sell its shares from this moment on.

The marketing phase

While waiting comments from the SEC on the draft registration statement, pre-marketing activities of the IPO start to be prepared. Analysts of the managing investment banks work at the so-called pre-IPO research report, which is used to educate institutional investors on the firm’s investment case. Before this report is released, the prospective IPO is undisclosed to the public. The importance of the research report relies therefore in the possibility of collecting

investors' feedbacks and their interest in participating in the IPO, helping therefore the underwriters to determine a price range for the issue. After the release of this document, a black-out period usually follows³: the lead investment bank does not release any another report about the issue, in order to avoid analysts' recommendations that could increase market demand or offering price. Sometimes, however, investment banks undertake confidential talks with some key institutional investors as well, in order to get their feelings about the issue (this pre-marketing practice is usually referred to as "pilot fishing"). Having collected the feelings from prospective institutional investors, a price range is set: the width of the range is quite variable, being from 10% to 20% or even more from the mid-price.

Once the pre-marketing step is over, the last weeks prior to the listing are dedicated to the roadshow in which the company, accompanied by the representatives of the bookrunners, conducts a series of presentations to an audience of potential investors and a series of one-to-one meetings with the most important ones (which is the most quoted way by investors, since it allows to avoid free riding on the information they get). In this way investors are able to quickly absorb the "equity story" and to evaluate their investment decision. Just targeting investors – those who are most likely interested in the issue – are invited to the roadshow: investment banks in fact usually consider only institutional investors and exclude retail ones, both because of the non-feasibility to manage a large number of small investors and because of the better knowledge about the value of the company by professional investors. These meetings usually take just a couple of weeks or even less, depending on the size of the IPO. They can take place in different financial centres, including also the city in which the stocks will be listed. The presentation made is usually 20 to 30 slides in length: it details the offering, the company's products and services, key selling points, industry trends and growth opportunities, competitive positioning and financial performance. In this sense, roadshow presentations do not add new information about the firm but "merely reiterate fairly general information already contained in the prospectus. Perhaps surprisingly, road shows may instead be a way for the investment banker to gather information from investors, about their views of the company and its valuation. [...] The marketing phase thus generates a lot of additional information regarding the reaction of the potential investors to the offer, which can be fed into the next stage of the process when the final price is set" (Jenkinson and Ljungqvist, 2001, pp.14-15). In this phase, investors are also solicited to make non-binding bids, from which a book of orders, useful to define the final offering price of the issue, is determined⁴.

³ The black-out period is a proper rule in the U.S., while it is more a common practice in other countries.

⁴ See the next paragraph "Pricing and allocation phase".

Besides the roadshow, issuing firm and investment banks have also other possible and additional alternatives of marketing an IPO, like press briefing and advertising. Marketing campaign is critical and, as stated by Kuhn (1990, p.269), it “will determine the success or failure of the IPO. The key is to stimulate investor demand for the stock so that, as in basic economics, the demand will exceed the supply.”

Pricing and allocation phase

The final steps of the IPO process are dedicated to the most critical phase: the pricing of the offering and the allocation of the shares among investors. As sustained by Espinasse (2014, p.193): “pricing and allocating an IPO is really more of an art than a science. It needs to take into account the priorities of the issuer, of the selling shareholders (if any) and of the investors so as to encourage aftermarket buying and a steady increase in the share price”.

Pricing an IPO is a really difficult task, since it is not possible to observe a market price prior to the offering; the offering price should in fact reflect the fundamental value of the issuing firm and should be aligned with the valuation of comparable companies. At the same time, it must also take into consideration issuer’s and underwriter’s different interests and needs. As stated by Sindelar, Ritter and Ibbotson (1994, p.66) “if the price is set too low, the issuer does not get the full advantage of its ability to raise capital. If it is priced too high, then the investor would get an inferior return and consequently might reject the offering”. This high uncertainty surrounding the setting of the price makes the role of the investment bank even more crucial in the overall IPO process and very strictly related to the price setting mechanism chosen. There are three main mechanisms to price and distribute shares:

1. fixed price offerings, in which the offering price is set prior to requests of shares being submitted;
2. auctions, in which a market clearing price is set after bids are submitted;
3. open price offerings, better known as bookbuilding, in which the investment bank canvasses potential investors and then sets an offering price.

Nowadays, the most common approach is bookbuilding. Despite the criticism it attracts for its lack of transparency, from 1990s, thanks to the penetration of American investment banks in the European market, this mechanism has become the most used worldwide. Draho (2004, p.219) sustained indeed that “issuers, underwriters and institutional investors appear to universally favour bookbuilding when given the choice”, but he then added that “issuers do not

get to choose their IPO mechanism. Either regulatory constraints limit the choice or market forces dictate that certain types of issuers must use a particular method”.

In fixed-price mechanism, the issue’s final price is fixed with respect to the market demand and is already specified in the preliminary prospectus. It is not influenced by investors’ orders and cannot be adjusted in response to excess supply and demand. Despite the presence of several allocation approaches reflecting the different market’s regulations, in fixed-price mechanism share allocation is usually performed on a pro rata basis when the issue is oversubscribed (“fair allocation system”).

Auctions are the least common type of price-setting mechanisms and currently, excluding some exceptions, is normally used only in four countries (France, Israel, Taiwan and the U.S.). In an auction, investors are invited to bid for shares, and once the offering is covered, shares are allocated among investors following some precise and transparent rules. Two kinds of auctions are used. One is discriminatory (or pay-what-you-bid) auction, in which winning bidders pay the price they bid. The other is uniform-price (or single price), where all winning bidders pay the same price, that is the market clearing price; it represents the highest price for which sufficient bids at decreasing prices cover the shares being offered. Investors specify the limit price of their offer and the number of shares they are willing to buy. The aggregate demand curve is formed by all individual orders and the final price is determined by matching demand and fixed supply. In case of excess demand each investors whose bid is above the clearing price would receive the whole amount of shares demanded, while the bids at the clearing price would receive a pro-rata allocation of shares. In general, there is no pricing and allocation discretion in an auction mechanism; once decided the type of auction, the underwriter has a passive role. As confirmed by Draho (2004, p.218) “the bids are effectively anonymous, as shares are allocated in a non-discriminatory basis to institutional and retail investors”.

The bookbuilding mechanism is instead typically characterized by a greater level of discretion allowed to underwriters in phase of pricing and allocation of shares. As already anticipated, after having distributed the preliminary prospectus with a first indication of offering price range and while the company’s management is presenting the issue at the roadshow, book-runners collect non-binding bids from institutional investors. According to its interest and strategy about the issue, each investor can submit different kinds of orders, in different points of time, revising some precedent bids or even withdrawing them. Bids can be mainly shaped in two different forms: strike bid (also called market order), in which the investor accepts to buy a given amount of shares regardless of the final price, and limit bid, in which the investor specifies the

maximum price he is willing to pay for the shares he wants to buy. As argued in NYSE IPO Guide (2013, p.41) “the goal of the bookrunner is to get as many market orders as possible in order to maximize price for the company, while still balancing appropriate value for investors and ideally achieving a Day 1 trading “pop” of approximately 15%⁵”. The overall bookbuilding process is therefore highly dynamic and, if it results that the demand is very strong or too weak, bookrunners can revise the range of the offering price and investors can submit new bids. For many IPOs, the majority of orders comes in the last two or three days of the roadshow. In this time bookrunners do not simply rely on investors’ demand curve but try to scrub the demand in order to identify which orders are real and intended to be held, and which instead have only been placed to “flip” the shares the very next day⁶. This provides the justification generally used by investment banks when trying to explain their discriminatory approach in allocating shares among institutional investors. Nevertheless, some recent studies have identified other relevant factors influencing the allocation decision by investment banks: Cornelli and Goldreich (2001) have empirically proved that investment bankers favour price contingent bids – those that are price limited, revised or early submitted in the bookbuilding period – since they would provide information which can then be used by bookrunners to set the offering price; Jenkinson and Jones (2004) however, which analysed a slightly different sample of IPOs, found little support to this view, even though they also specified that “we caution against interpreting our results as evidence against the general class of information revelation theories⁷”. Anyway, additional factors – common to both studies – that positively affect a preferential allocation of shares by investment banks are: size of bids (larger bids gets systematically better pro-rata allocation); high-frequency bidders (regular investors who participate in many issues are favoured); bidders of the same country of the issuer; bids submitted directly to the bookrunner (since the bookrunner decides the allocations, it tends to favour bids submitted directly to its own sales force, thus increasing its own fees, rather than to other members of the syndicate).

The last step of the bookbuilding process implies the review of the order book by the bookrunners – that takes into account many factors as the general market conditions and the performance of the company’s competitors during the roadshow – and the communication of the price per share recommendation to the issuer. This price meeting “is a crucial phase: the issuer wants to maximize the proceeds (and in part leave a “good taste” to the market), the investors want to make a good deal and the investment bank is in between” (Iannotta, 2010,

⁵ See Chapter 2 “*IPO underpricing: a literature review*”.

⁶ “Investors who receive an IPO allocation are said to flip their shares if they sell them immediately in the aftermarket. Flipping could be motivated by the desire to lock in quick profits or to dump shares before price stabilization ends” (Draho, 2004, p.263).

⁷ See Chapter 2 “*IPO underpricing: a literature review*”.

p.55). Once the company has then formally agreed on an IPO offering price with the bookrunners, the underwriting agreement is executed, and the underwriters literally purchase IPO shares and resell them to selected investors at the IPO offering price. In the period between the closing and the allocation of the shares, investment banks are exposed to a very little underwriting risk, since, although having submitted non-binding bids, institutional investors rarely renege on bid, given the repeated nature of their relationships with underwriters. Discriminatory pricing and allocation practices by the investment banks should guarantee a high-quality, long-term and focused shareholder base to the company.

Effective listing and trading phase

Once the IPO pricing and allocation have been performed, secondary market trading starts shortly after. On the first trading day the Designated Market Maker (DMM) – the agent designated on the exchange to facilitate trading by quoting a market in the stock – officially opens the newly public stock on the chosen stock exchange. Generally, the first days are characterized by strong volatility and extraordinary high trading volumes, especially when the stock is traded between short-term buyers and sellers, thus generating the possibility of immediate instability in the aftermarket. This could in turn affect the share price, which may temporarily fall below the offer price. It is therefore common in an IPO to appoint a stabilizing agent – generally chosen within the global coordinators and bookrunners – to go into the market and buy (or offer to buy) the securities to stabilize or maintain their price during the initial period after listing (Espinasse, 2014, p.209). As defined by the SEC, stabilization is indeed “the buying of a security for the limited purpose of preventing or retarding a decline in its open market price in order to facilitate its distribution to the public”. The possibility to perform stabilization activity must be disclosed in the IPO final prospectus and is generally covered by detailed market rules that set the manner, the timing, record keeping requirements and the price limitations associated with those activities, whose final aim is to avoid market manipulation.

In most markets, stabilization can be conducted through the use of an overallotment option, commonly known as “Green Shoe”, from the name of the first issuer which this technic was used for. Green Shoe consists in over-allotting the shares, that is in selling to investors more shares than are being offered (and underwritten by the investment bank), usually a 15% more of the base offer size⁸. The stabilizing agent overallots shares via short selling (that is selling

⁸ “Any more would send the signal to the market that the bookrunners expect a particular volatile start of trading. Much less than 10% probably would not reassure investors that the stabilizing agent has enough shares at its disposal to ensure orderly trading in the first weeks after the IPO” (Espinasse, 2014, p.210).

shares that it does not own). The issuer covers this short position in the sense that he grants the stabilizing agent an option to purchase shares from the issuer himself or from the selling shareholders in the following 30 days, giving therefore the investment bank the possibility to give back to him the shares borrowed. This option is however shaped as a call option (whose holder is indeed the stabilizing agent) on the over-allotted shares with strike price equal to the IPO price. Furthermore, being part of the service provided by the investment bank, it is granted for free. Two scenarios are possible. In the worst case, the price of the newly listed shares could drop, spreading a bad taste within the market about the issue and damaging investment bank's reputation. In this situation, the stabilizing agent simply buys the shares on the market, hoping to slow or reverse the fall; buying shares at a price lower than the IPO price produces three main results: it contrasts the price decline; which was the purpose of the stabilization activity; it leaves less shares in the market; and it generates profits for the investment bank (because it buys the shares back at a price lower than the one at which it has sold the shares). The Green Shoe option is in this case not exercised. In a better scenario, the price of the newly listed shares could rise: having to give back the borrowed shares to the issuing company independently on the price movements, the stabilizing agent buys back shares from the market by exercising the granted call option, thus avoiding to pay a price higher than the current IPO price; proceeds from the over-allotted shares are returned to the issuer as well. Since the issuer pays to the investment bank a fee on the total proceeds, the bank earns some additional money also in this case.

Over-allotment stabilization practice implies however some controversial issues. First of all, as already explained above, stabilizing an offering that has started to trade down usually generates additional revenue for the stabilizing agent; in recent years issuers and selling shareholders have therefore sought to share these stabilization profits, if any, with the investment bank, without reaching significant results. As argued by Espinasse (2014, p.213) indeed "since Greenshoes are not really technically underwritten by investment banks, but allocated to investors usually on the basis of a borrowing agreement, itself generally at no cost to the banks, the practice of paying management and underwriting commissions on over-allotment options has sometimes been criticized [...]. Market practice, however, continues to dictate that full fees be paid on Greenshoes". Secondly, Green Shoe mechanism is not always effective in stabilizing the market price. As demonstrated by Iannotta (2010, p.67) indeed, if the market price is only slightly below the issue IPO price, the trading profits from buying back the shares on the market at a price below the one they have been sold, might not be high enough to offset the opportunity cost of forgoing fees. So, whenever the level of overpricing (which verifies when the first day

price is below the issue price) is lower than the fees on total proceeds to the issuer, the investment bank exercises the option as well, even though the market price is lower than the issue price⁹. This theory is supported by Aggarwal (2000) study on aftermarket stabilization activities performed on 137 IPOs between May and July 1997, which shows that “underwriters manage the stabilization process and limit their losses by using a combination of short covering in the aftermarket, penalty bids, and exercise of the overallotment option. These activities are relatively inexpensive because the underwriter can manage the process”. Last, in some cases, the Green Shoe option does not work, because of an extreme selling pressure on the newly listed shares, which forces the stabilizing agent to wait the offer finding a natural price level, before going to buy back shares in the market.

Another very common post-closing stabilization activity used in IPOs is the so called “lock up” provision. It is a contractual agreement between issuing company and investment bank, that constraints the supply of shares, thus helping stabilization: issuer’s pre-IPO shareholders are asked not to sell their shares and the issuing company itself not to issue new shares for a certain period of time following the IPO. This wants to give the signal that company’s insiders will not cash out immediately. Restrictions vary depending on the regulator or stock exchange on which the shares are listed, as well as what has been negotiated with the bookrunners. In general, however, the company is prevented from raising new equity and pre-IPO shareholders from selling all or part of their holdings for a period of six months to a year after the publication of the final prospectus.

Finally, once the effective listing of the IPO shares starts, some restrictions apply also to banks’ syndicate in order to prevent them from influencing, through their deep information about the company, the price and the size of the traded shares. For instance, a research blackout or “quiet” period remains in force for those investment banks that have participated in the IPO. This generally lasts for a period of 40 days from the date of listing. At the end of this period, banks are free to formally initiate coverage, with reports including both share price targets and recommendations on whether to buy, hold or sell the shares. Another restriction regards the penalization (in form of taking away selling concession) imposed by underwriters to members of the selling group whose customers quickly “flip” shares in the aftermarket.

⁹ A partial solution to this problem would be the use by investment banks of a naked short position, which, however, is very rare. For a further analysis of the issue see “*A guide to underwriting and advisory services*” (Iannotta, 2010, p.73).

Costs and benefits of a traditional IPO

Until now, this elaboration has tried to accurately explain the main phases characterizing a traditional underwritten initial public offering, highlighting all the major services provided by investment banks in this process. From the due diligence analysis to the marketing, pricing, allocation and aftermarket stabilization activities, investment banks' intermediary role seems to be a fundamental point of contact between investors and issuing firm. On one hand, thanks to their long experience in corporate finance operations, investment banks support issuing company in all the aforementioned activities, speeding up the overall process and guaranteeing – especially in case of firm commitment contract – the full allocation of shares among investors, also trying to stabilize prices and volumes during the first weeks of trading; on the other hand, from investors' perspective, investment banks certify, through their reputation, the quality of the offering, and reduce information asymmetry in the stock market, since they produce and deliver information that otherwise would be more expensive and risky to acquire by investors themselves.

While the benefits of hiring such an intermediary are supposed to be clear, the costs are not. All the key decisions made by the issuer during the IPO preparation affect the direct and indirect costs of going public: the choice of the underwriter, the portion of equity sold to new investors, the proceeds to raise through the IPO, the pricing and allocation mechanism are all factors determining the final price of going public. Of course, the cost is also affected by other elements, not directly controlled by the issuer, like the firm size or the market volatility at the time of the IPO.

The most relevant cost of a traditional underwritten IPO is the underwriter's or syndicate's compensation, represented by a fee, or gross spread, which can be defined as the net difference between the proceeds from the public sale of the issue and the amount the issuer receives. Generally expressed as a percentage of total IPO proceeds, it may vary across countries and depend on issuer characteristics; it is also affected by the type of IPO chosen: in a best effort offering for instance, because of the associated lower risk, gross spread earned by investment banks is lower with respect to the firm commitment formula; a bookbuilding process then costs much more than a fixed price offering (Iannotta, 2010). However, in the U.S. from 1990, gross spread has tended toward 7% (Ritter, 2018). Gross spread can be divided into three components associated to three syndicate's groups: management fee (which, as a standard market practice, takes the 20% of the gross spread) compensates the bookrunner and the joint bookrunners for structuring the offering, conducting the due diligence, drafting the prospectus, dealing with regulators, managing the roadshow, pricing and allocating the securities; the underwriting fee

(20% of the gross spread) compensates the underwriting group for the underwriting risk (which, however, is minimal in bookbuilding IPOs), which then shares among members according to the number of shares underwritten; the selling concession (usually equal to 60%) is then divided among syndicate members based on the number of shares each one has sold. However, as previously explained, the lead bookrunner has significant discretion on the allocation of shares and, as a consequence, on the allocation of selling concession among syndicate members. This is the reason why the lead bookrunner is usually credited with much more sales (about 40% more) than the corresponding underwritten shares, while the other underwriters are credited with selling concession of about 10% relative to the underwritten shares (Corwin and Schultz, 2005).

Other direct costs may be related to fixed expenses: the issuing company is indeed required to cover investment banks' outflows, such as those sustained during market campaign and road show organization or those for the printing and mailing of the prospectus. Other fixed expenses are the fees paid to lawyers, accountants and consultants, that, accordingly to Heim (2002, p.28) "can easily add up to \$400,000 to \$500,000 for a typical IPO"; other fees are those due for the filing of the registration statement with authorities (as highlighted in the NYSE IPO Guide, for the SEC's 2013 fiscal year, they stood at \$136.40 per million dollars, so for a \$100 million IPO they would amount at \$13,640).

Regarding the ongoing costs of being public, the company has to incur expenses linked with the maintaining of a public company structure, like quarterly and annual reporting requirements, mandatory stockholder meetings or investor relations disclosures. Being public entails also incremental staff and board costs, professional fees for accounting advice, audit, legal and annual listing fees. These are all substantial and ongoing expenses that a company must consider before undertaking an initial public offering.

Finally, another relevant indirect cost of IPOs is in general underpricing. Defined as the percentage difference between the offer price and the first day closing price, it is an opportunity cost, since issuers, selling shares at a price below their potential market value, are "leaving money on the table"¹⁰.

¹⁰ Underpricing phenomenon will be described and analysed in detail in Chapter 2.

1.3 - AN UNORTHODOX WAY TO LIST: THE DPO PROCESS

Traditionally, a company decides to go public by hiring one or more investment banks in the role of underwriters, through which selling its shares to the general public. However, as previously anticipated, also underwriters have the faculty to choose which companies to assist in the listing process, mainly depending on their revenues and on their ability to reach successful performance shortly after the IPO. For this reason, from 1990s, taking advantage of the coming disruptive innovation of that time – the Internet – some small-medium companies which could not find any supporting investment banks, went public through an alternative process: the direct public offering (DPO), alternatively referred to as “direct listing”. Internet gave indeed these companies the possibility to market their stocks directly to the public by posting their offering documents on the Web, making them accessible to hundreds of millions of potential investors. DPOs are generally considered to be “disintermediated”, since there are no underwriters carrying them on¹¹.

Spring Street Brewing Company, a New York beer microbrewer, is regarded to be the first company to complete an Internet DPO. It was a small company, thus needed funds for expansion but was unable to attract an underwriter and unwilling to accept the terms offered by a venture capitalist. The microbrewer decided so to raise funds by offering its shares directly to the public over the Internet, posting its offering documents on its Website. Spring Street completed the offering in March 1996 raising roughly \$1.6 million by selling approximately 900,000 shares to 3,500 investors at \$1.85 per share (Fisch, 1998).

The following paragraphs will first explain in which measure DPOs differ from IPOs, will describe the main phases an issuing company has to face in conducting a DPO, and finally will try to analyse which could be the advantages of following such a listing process rather than a traditional one.

Main differences with a traditional IPO

A direct public offering basically consists in listing the shares of a company for trading on a stock exchange without conducting an underwritten IPO. As a result of this process, the shares of a privately held company are publicly traded and the company becomes subject to the periodic reporting requirements under the Securities Exchange Act of 1934 (Exchange Act).

¹¹ Nevertheless, as it will be explained in Chapter 4, in recent DPOs investment banks manage part of the listing process as well, but not playing the role of underwriters.

The first relevant difference of a DPO relative to an IPO can therefore be identified in the absence of investment banks in the role of underwriters: there is no investment banker deciding upon which institutional investors will participate at the roadshow; there is no bookrunner soliciting orders to investors to get their feelings about the issue and adjusting the offer price according to their targets; there is no underwriter actually purchasing shares from issuing company and then re-allocating them on a discretionary basis among favoured investors. Nevertheless, while first DPOs were completely disintermediated, with the management of the company handling with the whole listing process, or, if anything, with the support of external consultants like lawyers or accountants, in recent DPOs investment banks are still involved in the listing process, albeit playing a more marginal role than the underwriting one¹².

Another important difference is the fact that, unlike in a traditional IPO, no new capital is raised by the company through a DPO: the company indeed does not issue new shares and only limits to offer existing ones. From a technical point of view indeed, in a direct listing the company is not registering the offer of securities neither because the company issues new shares (primary offering) nor because its selling shareholders want to sell (secondary offering). The application and registration with the market authority has in fact the purpose of making the outstanding shares eligible for trading on an exchange, and not, intentionally, to distribute or sell securities that would need to be registered.

Finally, another substantive difference between a DPO and an IPO relies in the lack of lock-up period: in a traditional IPO, as it has been described in the previous section, existing company shareholders agree to a period, typically ranging from 180 days to one year from the date of the effective listing, where they are restricted from selling or issuing their shares. While they are not mandated to do so by the SEC, investment banks usually ask for this because it allows the company's shares to trade and establish a track record for a certain period of time. On the contrary, one of the purposes of a DPO is right that of providing a liquidity event to the company's existing shareholders who purchased their shares in the private capital markets.

At this point it would be easy to understand why companies that nowadays want to undertake a direct listing are those that may not have the resources to pay underwriters, may not want to dilute existing shares by creating new ones or may want to avoid lockup agreements. In the following three paragraphs DPO listing process will be illustrated in detail, trying to highlight some other secondary differences with respect to IPO process as well.

¹² This phenomenon is sometimes referred to as “reintermediation” of DPOs (Sjostrom, 2001), “Direct IPOs” (Sjostrom, 2001) or even “hybrid DPOs” (Anand, 2003). See next paragraphs.

Complying with registration requirements

The preparation process for a direct listing is very similar to that for an IPO. First of all, as for a traditional IPO, after having decided for the market in which to list, the company has to comply with registration requirements imposed by the market authority. In the U.S. therefore, every offering of securities must be either registered with the SEC or qualify for an exemption from registration. Thus, the first step for a company that is undertaking a DPO is to determine how it will comply with this rule. The Securities Act of 1933 establishes only two exemptions that allow companies to solicit an unlimited number of investors in multiple states through the use of general advertisement and which can be therefore applicable to DPOs: Rule 504 of Regulation D and Regulation A.

The SEC promulgated Rule 504 exemption in 1982 in an effort to aid small businesses raising seed capital. It exempts from registration the offer and sale of up to \$5 million of securities in a 12-month period. The only filing required to be made with the SEC within 15 days after the first sale of securities in the offering is the Form D, containing some basic information about the company.

Regulation A is often referred to as a “short form registration”, since it provides for a filing with the SEC of an offering statement, having similar requirements to those for a registration statement. Regulation A has two offering tiers: Tier 1, for offerings of up to \$20 million in a 12-month period, for which audited financial statements are not required to be included in the offering statement; and Tier 2, for offerings of up to \$50 million in a 12-month period.

If the company does not qualify for any of these exemptions, it must register its DPO with the SEC as usual. There is no registration statement’s form specifically designed for DPOs: the company must prepare the registration statement – often called “shelf” registration statement in the case of DPOs – in compliance with the same regulations that dictate the content and the form of a registration statement for a traditional underwritten IPO (Form S-1 for domestic issuers and Form F-1 for foreign private issuers). However, unlike for a traditional IPO, there is no industry practice for preparing a DPO registration statement (Sjostrom, 2001). Companies undertaking a DPO could for instance draft the registration statement by modifying publicly available registration statements of competitors, or by having a company counsel preparing it from scratch. Once done, the filing of the draft registration statement, the reviewing and the revision procedure by the SEC, are the same for a traditional IPO.

Nevertheless, in the U.S., any offering or selling of securities should also comply with the securities laws of the states in which the company is making the offer, unless the offering falls

within an exemption. Fortunately, Section 18 of the Securities Act of 1933 eliminates state securities registration requirements for IPOs of securities that will be traded on one of the major markets (NYSE or NASDAQ). However, since many DPOs are conducted by small-medium companies which do not meet the initial listing requirements of these major exchange markets, state registration could be a huge issue for those direct listings which intend to market in multiple states. In addition, even though a DPO qualifies for exemption from federal registration under Rule 504 or under Tier 1 of Regulation A, it must comply with state securities laws and regulations as well¹³. Complying with state regulations is a very costly and time-consuming process, since each of the fifty states has its own law in terms of registration requirements and exemptions. During years the North American Securities Administrators Association (NASAA) has sought to promote uniformity in regulation, simplify state registration of securities offerings and reduce associated costs: the SCOR of 1989 (Small Corporate Offering Registration) available for Rule 504 and Regulation A, the CER of 1997 (Coordinated Equity Review) available for offerings registered with the SEC, and the Regional Coordinated Review Programs represent the main efforts. Nevertheless, complete uniformity among states has not yet been reached (Sjostrom, 2001).

Marketing a DPO

“The success or failure of a DPO is determined by how many shares the company sells, which is directly related to how well the offering is marketed to the public” (Sjostrom, 2001, p.553). Before describing the main alternatives a company can choose to market its DPO, it is worth to underline that federal and state securities laws also define when and how marketing activities can be conducted. In particular, until the filing of the registration statement with the SEC, no soliciting of offers is possible: in this period a company should in fact just maintain communications with the public limited to the ordinary business and financial information disclosure. During the waiting period then, that lasts until the SEC declares the offering effective, a company is allowed to orally solicit orders, distribute its preliminary prospectus and make a strong advertisement with respect to its offering, but not yet to accept any offers. Once the SEC declares a registration statement effective, the company can finally accept offers and solicit further ones through the use of the final prospectus; from this moment onward, and so even before the stocks start materially trading, it is also allowed to provide prospective investors

¹³ Issuers in Tier 2 offerings of Regulation A instead are not required to register or qualify their offerings with state securities regulators.

with some forward-looking financial guidance, whereas in a traditional IPO it is not possible until the overall process has been completed.

Marketing techniques for a DPO are really heterogeneous, and strictly depend on the firms' pre-listing characteristics, on which the company retains to be the most effective ways to communicate with prospective investors, and, of course, on the amount of economic resources a company is willing to invest in this kind of activities. As explained by Sjostrom (2001), a company could use web marketing, posting the offering document on its website and placing advertisements in other websites, or could employ traditional marketing activities like advertisement in newspapers, telephoning most promising prospective investors or directly meeting them.

Of course, all the investor education and the relationship building efforts characterizing a typical marketing process for a traditional IPO, represent crucial aspects also for a DPO. Being perfectly aware about this, some medium-large companies undertaking a direct listing and having enough resources to dedicate to more sophisticated marketing activities¹⁴, have recently organized the so-called "Investor Day", which can be compared to the roadshow arranged in a traditional IPO. During this meeting, that usually takes place four or five weeks before the first day of trading, the company publicly talks with prospective investors and presents main historical financial results to all of them, also using instantaneous Internet communication via webcast. In this way, direct public offerings can be considered more democratic because every potential investor has access to the same information in the same time (McGurk, 2019). As in a typical roadshow, the listing firm also organizes one-to-one presentations with the largest and most influential investors in order to build demand, relation and trust in the management of the firm. During these one-to-one meetings, the firm is however accompanied by its "capital market advisors". Capital market advisors are the same investment banks which play the role of bookrunners and underwriters in a traditional IPO, but which, in this context, assume a more marginal position limited to marketing services. Despite the similar players and activities, though, the investor meetings under direct listing process are much more limited in scope compared to the schedule for a traditional IPO roadshow.

¹⁴ See last direct listing cases of Spotify (2018) and Slack Technologies (2019).

Pricing a DPO

In general, pricing mechanism underlying a direct public offering is deemed to lead to a “fairer” market price than bookbuilding process underlying a traditional IPO actually does (McGurk, 2019). This is mostly due to the absence of investment banks in the role of underwriters and to the fact that no solicitation of orders from investors is performed: even though a company decides to primarily market its offering arranging an investor day, a DPO never provides for the building of a book. However, also in a direct public offering, an offering price must be set before the effective listing of the stocks.

Companies undertaking a DPO that do not meet listing requirements of the major exchanges, price their offering and effectively list their selling shareholders’ stock through a rather quick process. On the same webpage where the company’s offering document is posted, a subscription agreement for investors, with indication of price and number of shares they desire to purchase, is also available. Investors have then to print out the subscription agreement, sign it and mail it along with a check for the shares to an escrow agent hired by the company. Once the escrow agent has received and deposited shares checks aggregating the amount of demand with the amount of the offering, the closing of the process starts: funds are therefore released to the selling shareholders of the company and sale confirmations and stock certificates are sent to investors (Sjostrom, 2001).

Companies undertaking a DPO which instead effectively meet listing requirements and that will therefore list on one of the major exchanges, follow a more articulated pricing mechanism. In this final phase, existing shareholders of the company must determine at what price they would be willing to sell their stock. To do so, the day before trading begins, the stock exchange usually publishes a reference price for the offering. On the NYSE for instance, this pre-opening reference price is represented by the most recent transaction price in the market, if the company has recently sustained trading in a private placement market; otherwise the reference price is defined by the stock exchange itself in consultation with the company’s financial advisor (which is always represented by one or more investment banks). By this time of course, the company must have already turned off any trading of company shares in other secondary markets. In the early morning of the first day of trading then, the designated market maker (the person designed on the exchange) starts to collect size of demand and then tries to define at what price supply and demand could match. In the meanwhile, buyers and sellers adjust their orders for several hours until an equilibrium price is reached. In this way, an opening price is set and effective listing on the stock exchange market begins. These initial trading dynamics do not differ too much from those undertaken in a traditional IPO, except for the lack of the lock-

up provision: for this reason, DPOs are generally considered to open the listing on the market with a more “natural” volume of traded shares. This volume is in general crucial in finding the “true” market price with a direct listing.

Risks and benefits of a DPO

Why, until now, have just few companies decided to go public through a direct public offering? The answer simply relies on the conspicuous risks and downsides this alternative listing process implies both on listing firm and prospective investors.

The first concern about direct listing process is absolutely liquidity. A stock is considered liquid if it has an active public trading market allowing easy buying and selling with minimum price influence. As already described, the primary underwriters of a traditional IPO, in an effort to guarantee liquidity following the listing of the shares, provide post-offering market support, which usually includes acting as a market maker for the stock, purchasing shares for its own account and issuing analyst reports and recommendations to develop investor interest. Conversely, in a DPO, since the company has no relationship with an investment bank with a vested interest in establishing an active secondary market, it is likely that the stock will be illiquid (Sjostrom, 2001). Moreover, this possible illiquidity is exacerbated by the lack of institutional investors, who instead provide a great deal of demand in a traditional underwritten IPO. Electronic matching systems used in closing a direct public offering only matches sellers and buyers, but do not create, by themselves, demand. Audience limitation in a DPO may be a key factor in deciding not to undertake it (Giddings, 1998).

Secondly, as previously explained, one of the reasons for a company to go public is that of gaining reputation from an increased shareholders base and attention from analysts and business press. In addition, other stakeholders, like customers or suppliers, may be more readily to work with the company because its financials and other data have been reviewed by investors and regulators and are publicly available. “The lack of a well-known and reputable underwriter lessens the overall credibility of the issuer” (Giddings, 1998, p.809), so that the aforementioned advantages of going public for a DPO strictly depend on the extent of attention from analysts and the business press, if any.

Beyond credibility, it is well known that the role of investment banks in the IPO process becomes crucial also in certifying the quality of the information provided by the listing company, and in particular the quality and truthfulness of the registration statement through an

accurate due diligence investigation. In this sense, liability exposure should be minimized since, investment banks' team is supposed to have the right accounting, finance and securities analysis skills to properly evaluate the information disclosed by the company and an extensive experience in drafting registration statements. In the case of a company undertaking a registered DPO with the market authority instead, the risk of liability becomes much more stressed. Firm's directors may have every intention to include complete and accurate disclosure in the company's registration statement; however, they may accidentally misstate or exclude information that would have been analysed by an underwriter's due diligence investigation. "Having securities counsel carefully reviewed a registration statement prior to filing can provide some comfort. However, unless securities counsel has intimate knowledge of the company's operations, he will only be able to verify that the registration statement appears to meet SEC requirements [...] but will not be able to detect misstatements or omissions" (Sjostrom, 2001, p.578).

Another important concern both from the listing company's and from the investors' point of view, is securities cybercrime. Especially for small and not well-known companies, a DPO brings the dangerous possibility to match uninformed and anonymous investors with unproven entrepreneur (Barmann, see Giddings, 1998). The perception about the risk of having a DPO listing company which arranges or that is subject to fraudulent schemes is quite high. Unsuspecting investors for instance, trying to create their own venture capital fund over the Internet or buying securities in a company they like, could be victim of these schemes.

On the other side, one could rightly ask: why have some companies decided to go public through direct listing, given all the aforementioned risks? A first explanation to this question could be provided by stating that, in general, DPOs do not only allow listing companies to broaden their group of affiliated investors, as more people come into contact with their products via the Web, but also allow to strengthen it. According to Drew Field, a San Francisco securities lawyer (see Giddings, 1998, p.794), DPOs "are not for start-ups" and "work best for successful companies with devoted customers, or affinity groups". Investors who are attracted by a DPO tend in fact to be loyal purchasers of the issuer's product who are investing for or tend to have a strong association with the company's brand. As these investors do not demand immediate profits, their approach to the investment is different from that of other investors (Hannon, 1996, p.74). "It's more like buying into a business than buying a stock" affirms Drew Field (Giddings, 1998). Moreover, DPOs' investors are in general ready to perform a deeper analysis of the company they are investing in: while in a traditional underwritten IPO investors simply rely on the capability of investment banks to complete a diligent review of the company, in a DPO

investors have first to evaluate the credibility of the proposed business plan and, second, the experience and reputation of the issuer's management. However, as stated by Sjostrom (2001, p.582) "members of the affinity group are already familiar with and may be emotionally attached to the company, and thus are willing to invest without fully verifying the accuracy of the offering document or relying on a certification intermediary".

The basic argument for undertaking a DPO rather than a traditional IPO is however related to cost savings. Hannon (1996, p.74) affirms that these "cost savings are tremendous because cutting out the underwriter, accountants, printing, and roadshows allows companies to go public at a cost of 6% of the total value of the issue, as opposed to a 13% average for a traditionally underwritten offering". Also Sjostrom (2001) highlights that, disintermediating the listing process allows to save underwriter's fee, printing fees because of the distribution of the offering documents directly on the Web, and legal fees, in the case the management of the company, and not the counsel, directly drafts the registration statement. Nevertheless, Sjostrom (2001, p.576) also points out that "against these dollar cost savings, as compared to a traditional IPO, will likely be increased filing and legal fees for registering the offering in various states [...] and marketing and advertisement fees". This argument is supported also by Anand (2003, p.442-443) who affirms that "in the DPO context, issuers will have higher costs (for lawyers and advisers) because of the need to discern the precise rules applicable to the transaction. If the DPO is being carried out on the Internet, issuers will need to expend resources to ensure that the website works as intended and that they are complying with any regulatory policies related to electronic communications. Lawyers of the DPO issuer will need to negotiate with regulators to determine how the transaction should proceed. [...] Thus, DPO issuers may face costs arising from uncertain law, heightened regulatory surveillance, or conservative application of the regulatory regime". In addition to no or decreased investment bankers' fees, DPOs could lead to lower ongoing costs if compared with a traditional IPO, because, especially for direct listings with no reporting requirements to the market authority, there is no need to hire additional personnel to deal with securities analysts or shareholders, and all the needed documentation is available on the company's website.

Another relevant argument in sustaining the advisability of DPOs relies, as already anticipated, to this mechanism's ability to generate a truer market price. Avoiding the intermediation of underwriters which directly purchase securities from listing firm and then discretionally resell them to institutional investors, trying to maximize, at the same time, their clients' proceeds (both company's and investors' interests) and their own revenues by manipulating somehow the initial offer price of the IPO, DPOs should reveal a market price which is more coherent

with company's equity value. In other words, since true offer and demand immediately match, DPOs should imply a lower level of underpricing. However, because the aim of this work is indeed that of demonstrating if the level of underpricing is lower when associated with a DPO – provided that it exists – rather to an IPO, this issue will be further analysed in the following chapters.

CHAPTER 2 – IPO UNDERPRICING: A LITERATURE REVIEW

The analysis of the underpricing phenomenon related to initial public offerings is supported by a broad literature background. Several studies and researches have been carried out since the early '70s. Pazarzi (2014, p.281) reported that “for the 40-year period between 1969 and 2010 there have been conducted more than 150 empirical studies regarding the underpricing of the IPOs”. Stoll and Curley (1970), Reilly (1973), Logue (1973), and Ibbotson (1975) were the first who documented and tried to explain the existence of the underpricing phenomenon: since then, their findings have been explored and developed by various authors, who elaborated different theories and models trying to detect the reasons and factors that cause IPO underpricing.

IPO underpricing, often referred to as “positive first-day return”, occurs whenever company’s shares are offered to investors at prices that are below the prices at which shares trade on the stock exchange the first day of listing; in other words, whenever newly issued shares close the first day of trading at a price above the set offer price, these shares have been underpriced. As already anticipated in the previous chapter, underpricing usually represents one of the most relevant indirect costs for a listing company. In particular, underpricing is generally considered an opportunity cost for firms going public since issuers selling shares at an offer price lower than their real market value are said to “leave money on the table”: “if the shares had been sold at the closing market price rather than the offer price, the proceeds of the offering would have been higher by an amount equal to the money left on the table” (Loughran and Ritter 2002, p.413). The amount of money that an issuer loses can be computed as the number of shares issued times the first-day capital gain¹⁵. Loughran and Ritter (2002, p.413) also proved that “during 1990-1998, companies going public in the United States left more than \$27 billion on the table [...]. The \$27 billion left on the table is twice as large as the \$13 billion in investment banker fees paid by the issuing companies that we studied. These same companies generated profits of approximately \$8 billion in the year before going public, so the amount of money left on the table represents more than three years of aggregate profits”. In addition, in primary issues underpricing produces a negative effect on pre-issue shareholders since it increases shareholders’ dilution (target proceeds of an IPO being equal, an underpriced IPO implies the issue of a larger number of shares than a non-underpriced IPO). In conclusion, positive first-day returns of IPOs come at the expenses of the issuing firm and its pre-issue shareholders.

¹⁵ For an accurate analysis of the underpricing calculation see *Chapter 3 – IPO underpricing: an empirical review*.

Despite differences during time, from sector to sector and from country to country, a constant presence of average underpricing in IPOs has been confirmed by numerous scientific papers and empirical researches (though some exceptions of no underpricing or overpricing effectively exist). Ritter and Welch (2002) showed that U.S. IPOs conducting in the period from 1980 to 2001 had an average first day return of 18.8%. Loughran and Ritter (2004) then demonstrated that the level of underpricing is cyclical: they found an average first day return of 7% in the 1980s, of 15% in the period from 1990 to 1998, of 65% during the so-called “dot-com bubble” (1999-2000) and finally of 12% in the years 2001-2013. Jenkinson and Ljungqvist (2001) instead concluded that IPO underpricing is approximately 15% in industrialized countries and around 60% in emerging ones.

Consequently, this remarkable empirical regularity has inspired a large theoretical literature that tried to rationalize IPO underpricing in any country and in any different institutional, legal and regulatory framework. In this chapter the most relevant theories and studies illustrating the reasons and factors behind IPO underpricing will be presented, being aware that it is not possible to identify an exhaustive model able to uniquely explain this ongoing phenomenon.

2.1 - ASYMMETRIC INFORMATION THEORIES

As broadly discussed in Chapter 1, the key parties in an IPO transaction are the issuing firm, the investment bank traditionally assuming the role of underwriter, and the prospect investors. Asymmetric information theories basically assume that one of these parties knows more than the others. They represent the first and the most relevant group of theories explaining underpricing phenomenon: there are models based on information revelation; others built on signalling of the firm’s quality; others then, focused on the existence of information asymmetry between various classes of investors or between the issuer and the underwriter. In this section the most quoted asymmetric information theories will be presented and discussed.

The winner’s curse

Among the different asymmetric information theories, the best-known model is represented by Rock’s (1986) winner’s curse, which is an application of Akerlof’s (1970) lemons problem. As in Akerlof’s theory, where uninformed buyers have an informational disadvantage and are not able to distinguish between good quality and bad quality products, also Rock’s model bases on the assumption that is possible to categorize investors into “informed” and “uninformed”: some

investors are better informed than others about the real value of the shares on offer. Winner's curse theory also assumes that neither the investment bank nor the issuing firm are not completely informed about the real value of the offered shares, so that they are in informational disadvantage, since, on one hand they must reveal to the market all the information included in the prospectus, but on the other hand, they are not able to obtain all the information possessed by informed investors (usually institutional investors). Informed investors, taking advantage of their additional information, bid only for attractively priced IPOs (i.e. for underpriced shares), while uninformed investors apply indiscriminately, because they are not able to distinguish between underpriced and overpriced shares. This imposes a winner's curse on uninformed investors: in unattractive offerings (i.e. in case of overpriced shares) they receive all the shares they have bid for because there is no competing demand; whereas, in attractive offerings, they get only a small fraction of underpriced issues due to the high demand from informed investors. In the extreme case, uninformed investors receive nothing in underpriced IPOs and get the full allocation in overpriced IPOs, resulting in average returns that are negative. Consequently, knowing the winner's curse phenomenon, uninformed investors abstain from participating at the offering, so that the IPO market is populated only with (equally) informed investors. Information asymmetry causes adverse selection and would lead to market failure. Thus, Rock assumes that the primary market is dependent on the continued participation of uninformed investors, in the sense that informed demand is not sufficient to absorb all the shares offered even in attractive offerings. According to Rock's theory therefore, underpricing is needed to attract and to make uninformed investors participating in the IPO, because it ensures them, at least, a non-negative return. Of course, this does not remove the allocation bias against the uninformed investors, but thanks to systematic underpricing of shares, they no longer expect to make losses on average. It is worth to point out that Rock's theory can be used to explain underpricing only in fixed-price offerings, whereas winner's curse is not an issue in bookbuilding process, because the investment bank solicits investors' feedbacks and information prior to the final pricing.

A key empirical implication of Rock's winner's course model is that the degree of underpricing should increase in the ex-ante uncertainty about the value of the firm. Beatty and Ritter (1986, p.215) provided the following intuition: "[...] the degree of underpricing, is directly related to the ex ante uncertainty about the value of an issue. This is because, as the ex ante uncertainty increases, the winner's curse problem intensifies. Roughly speaking, there is more to lose as ex ante uncertainty increases. Consequently, in order to be willing to submit a purchase order for shares in an offering with greater ex ante uncertainty, a representative investor will demand that

more money be ‘left on the table’, in an expected value sense, via underpricing”. Alternatively, an investor can be seen as implicitly investing in a call option on the IPO, which will be exercised if the ‘true’ price exceeds the strike price, that is, the offering price. The value of this option increases in the extent of valuation uncertainty. Thus, the greater the valuation uncertainty, the greater the portion of informed investors. This raises the required underpricing, since an increase in the number of informed investors aggravates the winner’s curse problem.

Being one of the first theories developed about underpricing, Rock’s model assumptions and findings have been largely discussed in the literature. Benveniste and Spindt (1989) questioned the assumption that abstaining from participating in overpriced issues is costless for informed investors. They showed that this choice can cost an investor the opportunity to take part in future (underpriced) offerings and, consequently, also informed investors decide to participate in less attractive issues.

Hanley and Wilhelm (1995), instead, found evidence against the fact that informed investors impose a winner’s curse on uninformed ones by applying only for underpriced offerings. Studying a sample of 38 IPOs managed by a single underwriter, they found that approximately 70% of shares of underpriced issues are allocated to institutional investors but also that “institutional investors take similar large position in overpriced offering” and that “institutional investors are allocated large proportion of issues for which pre-offer interest is weak and also of issues for which it is strong” (Hanley and Wilhelm, 1995, p.240).

Jenkinson and Ljungqvist (2001) then discussed the assumption that issuing firms must sustain underpricing cost in order to have uninformed investors participating in the offering. In fact, if informed investors are not enough to absorb all the offered shares, the uninformed ones could invest through institutional-informed investors (for example using investment funds) in order to exploit their superior information – in exchange for a fee – and not subscribe overpriced shares.

Information revelation theories

According to information revelation theories, as assumed by Rock (1986) some institutional investors are better informed than the issuer and the investment bank about the firm’s competitors, the industry and the economy as a whole. However, in the absence of inducements, investors are not incentivized to reveal positive information about their own demand for the shares to underwriters: doing so, would probably lead to an increase in the final offer price (in

informationally efficient market indeed, prices should reveal all available information), and thus to lower profits for the informed investors. In most cases even, there is a strong incentive to actively misrepresent positive information – that is, to understate effective interest in an offering by potential investors – in order to induce underwriters to depress the price at which they will then purchase shares. Therefore, since the disclosure of information is essential to avoid mispricing, underwriters must find a mechanism that induces investors to truthfully reveal their private information.

Benveniste and Spindt (1989), who first introduced the “information gathering theory”, pointed out that bookbuilding could be an appropriate mechanism, under certain conditions, to induce investors to reveal information about the demand for shares in the pre-selling phase. As described in Chapter 1, during the road show and before the final price has been set, investors are asked to communicate their interest and to submit their bids specifying the price and the number of shares they are willing to buy. After collecting investors’ indications of interest, investment banks allocate no, or only a few, shares to any investors who bid conservatively, while they reward with disproportionately large allocations of shares those investors who bid aggressively revealing favourable information. In this way, bookbuilding process allows underwriters to reduce the incentive to mispresent positive information. However, the more aggressive are investors’ bids, the more the offer price is raised. Thus, investors who truthfully reveal their private (positive) information and their expectations about the value of the listing company must be rewarded with underwriters’ discretionary allocation of underpriced shares. By doing so, bookbuilding mechanism reduces uncertainty and information asymmetry between investors and investment banks. Leaving some money on the table is necessary because, in the absence of underpricing, investors would not have interest in revealing their positive information.

A contribution to information revelation theories has been supplied by Benveniste and Wilhelm (1990). They stated that the optimal mechanism to acquire information from informed investors is price discrimination and that underwriters need to use a combination of price and allocation discrimination to maximize proceeds. If investment banks could offer underpriced shares only to well-informed investors, their incentive to truthfully reveal positive information would be stronger and issuers would leave less money on the table. However, regulatory constraints generally forbid price discrimination among investors; in addition, especially in Europe and Asia, the common practice requires a certain fraction of the shares to be allocated to retail investors, thus reducing underwriters’ ability to target allocations at the most informed investors. Therefore, according to Benveniste and Wilhelm theory, imposing such constraints

on the underwriter's allocation discretion only interferes with the efficiency of the bookbuilding mechanism, forcing investment banks to underprice the issue to all IPO subscribers, without rewarding only informed ones.

In addition, Benveniste and Wilhelm also studied the interaction between Rock's winner's curse and information revelation. They demonstrated that, when underwriters are able to extract information from well-informed investors using bookbuilding mechanism, both the information asymmetries among investors and between investors and underwriters are reduced. This, in turn, reduces the winner's curse and thus the level of underpricing required to ensure uninformed investors break even.

Another support to Benveniste and Spindt theory is provided by Hanley "partial adjustment" phenomenon (1993). She showed that the new positive information collected during bookbuilding process is only partially incorporated in the final offer price. Using Iannotta (2010, p.93) words, "when investors inform the investment bank that the price should be revised positively, the book-runner only partially adjust the price". Hanley (1993, p.249) demonstrated also that "underpricing is positively related to revisions in the offer price from the filing of the preliminary prospectus to the offer date. [...] Issues that have positive revisions in the offer price and good information revealed are significantly more underpriced than other IPOs".

A limitation in the assumptions of Benveniste and Spindt framework relies in investors possibility to become informed without incurring any costs. In general, however, information production is costly: underwriters need it to decide how much information production to induce. Sherman and Titman (2002) explored this issue in a setting where more information increases the accuracy of price discovery, resulting in a trade-off between the (issuer-specific) benefit of greater pricing accuracy and the cost of more information production. The idea is further investigated by Benveniste, Busaba, and Wilhelm (2002) and Benveniste and others (2003), who resorted to underwriter's capacity to 'bundle' IPOs over time. The central intuition is that valuation uncertainty is composed of a firm-specific and an industry component. Obtaining information about the industry component allows investors to evaluate other offerings in that industry more cheaply. Nevertheless, such economies of scale could result in too few firms going public, because the first firms to do so must compensate investors for their whole valuation effort, while later firms can 'free-ride' on the information production. Underwriters could be able to reduce this negative externality by establishing networks of regular investors with whom to undertake a sequence of offerings. If underwriters and institutional investors deal with each other repeatedly in fact, the cost of information acquisition can be reduced.

Principal-agent models

“Bookbuilding theories” stress the fundamental role of investment banks in extracting information that is then valuable in price-setting, and the benefit of giving them discretion over allocation decisions. Some authors – in particular Loughran and Ritter (2004) – point out the “dark side” of these institutional arrangements, by highlighting the potential for agency problems between the investment bank and the issuing firm. The theoretical literature linking agency conflicts and IPO underpricing goes back more than 20 years to Baron and Holmström (1980). Baron (1982) in particular assumed that investment banks have superior information about the demand level for the shares offered and capital markets. According to Baron, issuing firms rationally allow underwriters to underprice in order to compensate them for the use of their superior information. To induce optimal use of the underwriter’s superior information about investors’ demand, the issuer delegates the pricing decision to the investment bank. Given its information, the underwriter self-selects a combination of IPO prices and underwriting spreads. Since underwriting fees are typically proportional to IPO proceeds and, as a consequence, inversely related to underpricing, when investors’ demand is low the bank selects a high spread and a low price, and vice versa when demand is high. This mechanism optimizes the underwriter’s unobservable selling effort by making it dependent on market demand. Therefore, the more uncertain is the value of the firm, the greater the asymmetry of information between issuer and underwriter, and thus the more valuable is the investment bank’s service, resulting in greater underpricing.

However, Muscarella and Vetsuypens (1989), testing Baron’s model, found that the information asymmetry existing between the issuing company and the underwriter firm is not appropriate to explain the underpricing phenomenon. In their empirical analysis, they used a small sample of 38 IPOs of investment banks going public without referring to other intermediaries. In nutshell, they selected a sample of “self-marketed” or “self-underwritten” IPOs, in which investment banks participated in the distributions of their own shares. In this way, the issuer and the underwriter coincide in a single entity and, therefore, there is no information asymmetry and there are no principal-agent problems. Muscarella and Vetsuypens showed that, in contrast to Baron’s findings, “self-marketed” IPOs are statistically subject to significant underpricing as well and that these IPOs present a level of underpricing not lower than the traditional IPOs.

Signalling theories

In contrast to the other asymmetric information theories analysed so far, signalling theories assume that issuing companies are the well-informed party – rather than investors or investment banks – and so have superior information about their own true value and about the risk of their future performance. In this context, underpricing is a way to signal firm's high quality: even if costly, is used by high-quality firms to reveal to prospective investors their true equity value and to raise capital, in subsequent equity stages following IPO, at more advantageous terms.

Ibbotson (1975) was the first to introduce signalling theory as IPO underpricing explanation. He stated that issuing companies intentionally underprice in order to “leave a good taste in investors' mouths so that future underwritings from the same issuers could be sold at attractive prices” (Ibbotson, 1975, p.264). Signalling their quality and positive commitment by underpricing thus, allows issuers to later sell additional shares in the market at more favourable conditions. Ibbotson theory was further developed by other authors, among them Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989).

In their model, Allen and Faulhaber (1989) supposed that there are only two types of firms: good quality and bad quality firms¹⁶. They also assumed that firms are better informed by their “prospects than anybody else” (Allen and Faulhaber, 1989, p.307) and so only issuers precisely know the category of firm which they belong to. In this model investment banks play no active role in certifying the quality of the issuing company. In addition, issuers are risk-neutral: they want to maximize expected proceeds that are the sum of issuing proceeds from initial public offerings and subsequent seasoned offerings. Allen and Faulhaber theory states that good firms signal their quality through the initial offering price: the level of underpricing is therefore positively related to the quality of the firm. Allen and Faulhaber (1989, p.304) affirmed that “underpricing the firm's initial offerings (which is an immediate loss to the initial owners) is a credible signal that the firm is good to investors, because only good firms can be expected to recoup this loss after their performance is realized. Good firms find it worthwhile to underprice their IPOs, because by doing so they condition investors to more favorably interpret subsequent dividend results. The owners of bad firms know their expected performance and subsequent market valuation. They know they cannot recoup the initial loss from underpricing, and so cannot afford to signal”.

Grinblatt and Hwang (1989) developed a similar model to the one proposed by Allen and Faulhaber. In particular, they assumed that company's managers are well-informed about firm's

¹⁶ In the model, the quality of the firms is defined by the expected dividend stream.

future cash flow, while investors have little knowledge about project cash flow and their variance. In this model issuing firms use two different tools to signal their quality: the degree of underpricing and fractional holding (retained shares). They showed that the decision to retain part of the shares issued, is a signal of managers' optimism about firm' future prospects. They observed positive relationship between the retention rate and initial returns, and also between the level of underpricing and the value of the firm.

Finally, Welch (1989) built a model in which he assumed that firms are rational actors with superior information operating in a perfectly competitive capital market. The basic intuition of the model is that low quality firms must incur very high imitation costs to appear to be high quality firms. Investors probably may be able to find out the firm's true quality after the IPO and before other seasoned offerings; this exposes low quality issuers to the risk that their true value could be detected before they can recover the benefit from imitating the high quality issuers' signal. The cost of underpricing can therefore induce low quality firms to voluntarily refrain from imitating the high quality ones, so that high quality firms can influence investors' opinions about their value by deliberately leaving money on the table at the IPO, and then recoup this money in seasoned equity offerings. In this way, Welch demonstrated that the cost of signalling is lower for high quality firms and that the degree of underpricing is positively correlated with the firm quality. "The model strongly suggests that IPO firms pursue a multiple issue strategy when they choose both the price and the proportion of the firm they offer at their IPO. The reason why IPO underpricing results in a higher SO [seasoned offering] price is an information asymmetry between firm owners and investors. High-quality firm owners can signal their superior information to investors because their marginal cost of underpricing is lower than the marginal cost of underpricing for low-quality firm owners" (Welch, 1989, p.445).

Though providing an important alternative point of view among the various asymmetric information theories, signalling theories have often been challenged by authors who argued that firms may choose a wide range of signals, other than underpricing, to advise about their real quality. Just to mention some of them, Booth and Smith (1986) highlight the possibility to hire particularly reputable underwriters, Titman and Trueman (1986) quote auditors while Megginson and Weiss (1991) venture capitalists.

Efficiency of direct public offerings

Within the numerous works summarizing the wide literature around IPO underpricing, Anand theory about the efficiency of direct public offerings (2003) is not usually presented among the traditionally corroborated asymmetric information theories analysed so far. Neither it is disclosed as an extension of these theories, as it does not provide supplemental explanation to the underpricing phenomenon in traditional IPOs. However, this thesis wants to study Anand intuition in this precise point of the elaboration, first because it illustrates the degree of information asymmetry in DPOs, also suggesting some solutions to overcome it, and then because it tries to explain the reasons behind the existence of underpricing also in DPOs, clarifying under which circumstances this unorthodox listing mechanism may contribute to the efficiency of capital markets.

In Chapter 1, it was highlighted that one of the most relevant risks of undertaking a DPO relies in the lack of certification of the offering usually provided by investment banks. In this section, both Rock's model and information revelation theories have shown how in traditional IPOs the information asymmetry between (institutional) investors – who have superior information – and issuing firm is greatly reduced by mean of intermediaries (i.e. underwriters). In the absence of such intermediaries, the cost deriving from information asymmetry could be even larger: in this case, even investors suffer an information disadvantage, since no entity is guaranteeing the quality of information disclosed by the firm. As argued by Black (1998) an adverse selection problem exists also in disintermediated listings, precisely because investors are not able to distinguish which issuers are truthful and which are not. This, in turn, leads uninformed investors to discount the prices that they will offer for all DPOs securities. According to Black (1998), in this context DPO issuers are victims of a sort of “death spiral”: high quality issuers exit the market because they cannot obtain a fair price for their shares; low quality issuers resist inside the market and “as a result, investors discount still more the prices they will pay. This in turn only drives more honest issuers away from the market and exacerbates the adverse selection problem” (Black, 1998, p.92). However, in her theory about DPOs efficiency, Anand (2003) tries to offer some strategies which may help DPO issuers to avoid this death spiral and to reduce information asymmetry with respect to prospect investors, by signalling them their true quality. Anand's first intuition relies in the possibility for management and principal security holders to establish a voluntary lock-up agreement, equivalent to those typically demanded by investment banks. “The lock-up agreement would signal credibility, value, and management's commitment to the long-term success of the DPO issuer” (Anand, 2003, p.456). Another way to convince sceptical investors about the credibility of the issue is that of

purchasing, by insiders and founders, additional shares during a DPO, so to send a strong signal about the value of the offered shares. A third possibility deals with performance-compensation schemes: “management would be rewarded well for the company's success but would suffer with shareholders in periods of poor financial performance. Statements regarding these types of performance-based compensation strategies could be placed in the prospectus or even the articles of incorporation” (Anand, 2003, p.456). Moreover, DPO issuers could use earnings forecasts, disclosures about the previous performance of the company or valuation of the company's stocks in order to signal their value. Finally, founders of a DPO firm could commit to sign the offering prospectus, thus assuming liability risk and guaranteeing that information contained therein is accurate. “By signing the prospectus, founding security holders would also reduce the need for individual verification of the disclosure contained therein. [...] However, the signatures of founding security holders would serve as an “insurance contract” for outside investors” (Anand, 2003, p.457). Despite being costly, implementing some of these signalling strategies may help DPO firms to largely reduce the adverse selection problem and therefore to obtain a more favourable price from investors (i.e. less underpriced).

Anand reasoning of DPO underpricing originates from Rock's model assumptions. As known, Rock individuated two types of information asymmetry: the one between firms and investors and the one among investors. As just discussed, the first type of information asymmetry, which originally would be greater under DPOs rather than IPOs, can be largely reduced if a DPO issuer undertakes some of the aforementioned signalling strategies. In addition, Anand also points out that in a DPO “when all outside investors possess the same information about the firm, there should not be any underpricing” (Anand, 2003, p.459). The second type of information asymmetry – that across all investors – is also minimized in a DPO since, as illustrated in Chapter 1, marketing DPO techniques usually allow all prospective investors to access the same information in the same time. Thus, underpricing would seem to have no rationale in direct public offerings. However, Anand identifies DPOs underpricing explanation in capital markets' competition. She states indeed that “in an offering with no underwriter, the issuer must underprice its securities to be comparable to similar offerings in which an underwriter is engaged. [...] In addition, DPO issuers may have to discount their securities further to offset the higher information costs that investors must now bear individually. Investors will invest only if the DPO is priced to compensate them for their increased level of risk in the absence of an underwriter” (Anand, 2003, p.459). Therefore, a certain degree of underpricing is required also in direct offerings, first to be able to compete with traditional underpriced IPOs, and second to compensate investors for the additional risk and greater

information extraction effort they bear in the absence of an underwriter. Consequently, Anand shows that, if this required level of underpricing plus any additional costs incurred to complete a DPO – including costs of signalling – do not exceed the commission fees the issuer would have paid to an underwriter, undertaking a direct listing could be convenient and could lead to obtain higher net proceeds from the offering. Using her own words, “[DPO] issuers may also receive higher net proceeds for the securities offered. If they are able to do so, provided the costs of signalling do not reduce the net proceeds received by the DPO issuer to a level at or below that received by an issuer in an underwritten offering, capital market efficiency should increase” (Anand, 2003, p.460).

2.2 – OWNERSHIP DISPERSION THEORIES

A different group of theories explaining underpricing focuses on the ownership structure’s changes, and in particular on the ownership dispersion, originated from an IPO. In fact, in most of the cases, the going public decision entails the separation of ownership and control. IPO ownership dispersion is relevant because it can have strong and direct effects on management’s incentives and control to make optimal operating and investment decisions. In particular, agency problems between managing shareholders and dispersed shareholders could arise when the firsts, rather than maximizing expected shareholder value, maximize their expected private utility at the expense of outside shareholders.

Zingales (1995) and Booth and Chua (1996) were the first authors who deeply investigated the relation between the going public decision, the ownership’s structure changes and IPO underpricing. Zingales claims that companies undertake initial public offerings also to optimize their ownership structure and he showed that a more diffuse ownership allows controlling shareholders to obtain a higher price when selling their controlling stake. So, company owners intentionally try to create diffuse ownership using IPOs and maintain a controlling stake to extract more surplus from a future potential buyer.

Booth and Chua instead (1996) demonstrated that issuers effort to create broad ownership dispersion generates an incentive to underprice shares. “Secondary market liquidity increases with the level of oversubscription and ownership dispersion, which in turn increases total information costs and underpricing” (Booth and Chua, 1996, p.307). Underpricing and oversubscription therefore increase initial ownership dispersion, resulting in a more liquid secondary market.

However, the most known models rationalizing underpricing within the context of ownership dispersion are those of Brennan and Franks (1997) and Stoughton and Zechner's (1998).

Underpricing as a mean to retain control

Analysing a sample of 69 IPOs issued in the UK between 1986 and 1989, Brennan and Franks (1997) showed that underpricing is a mean to retain managerial control by avoiding monitoring by a new large outside shareholder. According to Brennan and Franks, underpricing typically produces oversubscription and it is therefore followed by rationing in the share allocation. Thanks to underpricing, companies' managers have the opportunity to strategically allocate the shares when going public, and therefore, to protect their private benefits. The role of underpricing in this model is that of generating excess demand, which in turn enables managers to ration investors so that they end up holding smaller stakes in the business. Indeed, when owners wish to maintain the control of the firm also after the IPO, they deliberately underprice the issue so to ensure oversubscription: this reduces the possibility of a hostile takeover because it allows the owners to discriminate between potential subscribers. Shares are then rationed to investors in order to reduce the block size of new shareholders: "the discrimination is usually against large applicants and in favour of smaller applicants" (Brennan and Franks, 1997, p.412). A largely dispersed ownership in this sense should guarantee to the incumbent managers to avoid constant monitoring by a new large shareholder.

Some authors argued that underpricing-induced ownership dispersion is not the only way to protect private benefits of control. Available alternatives could be to put in place takeover defences before going public or simply to issue non-voting stocks. Field and Karpoff (2002) showed that a majority of U.S. firms undertakes at least one takeover defence, especially when private benefits of control appear large and internal monitoring mechanisms are weak. Other authors then claimed that underpricing and the resulting excess demand protects managers from outside monitoring only when outside investors do not assemble large blocks once trading has begun. Brennan and Franks (1997) however replied that when a large investor is expected to put together a large stake and to change the ownership structure of the firm, the share price will likely increase. Thus, assembling a large block of shares in the aftermarket could probably be unprofitable.

Underpricing as a mean to reduce agency costs

In contrast to Brennan and Franks (1997), who view underpricing as a mean to retain control by avoiding monitoring by a large outside investors, Stoughton and Zechner (1998) developed a model in which underpricing may be used to minimize agency costs by encouraging monitoring. Ownership structure can affect corporate governance efficiency and, as a consequence, firms' value. Agency costs are ultimately borne by the owners of a company, in the form of lower IPO proceeds and a lower subsequent market value for their shares. Since, in most of the cases, managers are also in part owners of the company, they bear some of the costs deriving from their own opportunistic behaviour. If their stakes in the company are large enough so that the agency costs they bear outweigh the private benefits they enjoy, it will be in their interest to reduce their own discretion. Therefore, Stoughton and Zechner (1998) observed that it may be value-enhancing to allocate shares to a large outside investor since, in general, this type of investors is better incentivized to monitor managerial actions, exactly because of the large stake they own. Therefore, in this model the rationing in the share allocation is used to favour larger rather than smaller investors, so to reduce agency problems and enhance monitoring on management. However, if this large allocation is not optimal from the investor's point of view (for instance because it is not easily diversified), this investor can be further incentivized through the allocation of underpriced shares.

2.3 – INSTITUTIONAL THEORIES

Another group of underpricing theories adopts institutional explanation to rationalize the robust phenomenon of underpricing. The most quoted argument belonging to this group is absolutely lawsuit avoidance; however, this explanation is in a certain sense U.S.-centric, because, as it will be described later, liability rules are particularly strict in the U.S., while they are not in many other countries where underpricing is widespread as well. A second institutional approach instead, deals with underwriters' price "manipulation" and stabilization services in the after-market. A third institutional insight then comes from tax arguments.

Legal liability

Lawsuit avoidance as explanation of underpricing goes back to Logue (1973) and Ibbotson (1975): their basic idea of their insights is that underpricing is deliberately used by companies as an insurance tool to reduce the likelihood of possible litigation and future lawsuits from

shareholders. Disclosure and liability rules are indeed quite stringent in the U.S. and expose underwriters and issuers to considerable risk of litigation by investors: Lowry and Shu (2002), for instance, estimated that nearly the 6 percent of companies listed in the U.S. between 1988 and 1995 were subsequently sued for violations relating to the IPO. Lawsuits are obviously very costly for the issuing firms, not only in terms of direct costs – such as legal fees or opportunity costs of management time – but also in terms of the reputational damage, which could lead issuers to face a higher cost of capital in case of future offerings. Therefore, issuing companies try to insure against these costs by voluntarily underprice the offered shares: this should reduce the probability to be sued for misstatements or omissions in the IPO prospectus or for poor post-IPO performance of the shares.

However, the main contribution to lawsuit avoidance theory was provided by Tinic (1988) and by Hughes and Thakor (1992). Tinic started from Logue and Ibbotson intuition that underpricing is used by companies to insurance against legal liability and reputational damage. Tinic hypothesis is the following: the higher is the risk of future litigation, the higher should be the underpricing applied by the issuing firm. In order to prove his hypothesis, he assumed as determining factor the Security Act of 1933, the first relevant legislation regarding the offer and sale of securities that increased firms' disclosure and liability requirements, and in turn also the risk of future litigation with shareholders. Analysing two samples of IPOs – one including IPOs performed before the Security Act of 1933, from 1923 to 1930, and the other including IPOs performed after the Security Act of 1933, from 1966 to 1971 – he confirmed that underpricing was significantly lower for IPOs performed before 1933, when the lawsuit avoidance was not a real problem, and was higher once the Security Act became effective.

Hughes and Thakor (1992) developed a more articulated model, suggesting that companies usually face a trade-off: on one side, they want to minimize the probability of litigation, and hence the potential associated costs; on the other side, they also aim at maximizing the gross proceeds from the IPO (and consequently the underwriter's commission). According to this, they assume that the probability of litigation is a positive function of the offer price: the more overpriced is an issue, the more likely is a future lawsuit. Nevertheless, they also point out that, even if a relation between litigation risk and underpricing exists and can be empirically tested in most IPOs, litigation risk is not a unique and exhaustive cause of underpricing phenomenon since “underpricing occurs even in countries where litigation risk is not a factor” (Hughes and Thakor, 1992, p.737).

Finally, Lowry and Shu (2002) found a reciprocal correlation between underpricing and lawsuit probability. They started from Hughes and Thakor theory and noted that firms can lower the

probability of being sued by performing an accurate due diligence before the IPO and by decreasing the potential damages for IPO investors using underpricing. They wanted to simultaneously analyse “whether litigation risk affects IPO issuers’ incentives to underprice their issues and whether underpricing lowers the expected litigation costs by reducing lawsuit probabilities” (Lowry and Shu, 2002, p.311). In their analysis, Lowry and Shu found evidence and support for both effects and in particular they demonstrated that “firms with higher litigation risk underprice their IPOs by significantly greater amount” and that “firms that engage in more underpricing significantly lower their litigation risks” (Lowry and Shu, 2002, p.333).

Price stabilization

As already described in Chapter 1, price stabilization is one of the main services the underwriter provides after the effective listing of a company’s shares, intended to reduce or avoid price drops in the aftermarket for few weeks. Some authors argued that underpricing is an intentional consequence of such a stabilization performed by investment banks. First of all, Ruud (1993) sustained that IPOs are not deliberately underpriced. He observed that IPOs initial returns, rather than forming a symmetric distribution around some positive mean, typically peak sharply at zero and rarely fall below zero. The left tail of the distribution (i.e. negative returns) would be eliminated by stabilization of those offerings whose prices threaten to fall below the offer price, so to put in evidence only positive average price jumps. Therefore, observed data could not reveal the unconditional expectation of true initial returns, but the mean conditional upon underwriter intervention in the aftermarket. Estimating the unobserved unconditional mean of IPOs initial returns through the use of a particular model, Ruud was able to demonstrate that average first-day returns are indeed close to zero.

Benveniste, Busaba, and Wilhelm (1996) model then formalizes the idea that “a commitment to price stabilization effectively bonds the underwriter against overstatement of pre-offer interest and subsequent overpricing of the issue” (Benveniste, Busaba, and Wilhelm, 1996, p.225). Since underwriters’ fees increase in gross proceeds, these are incentivized to raise the offer price. During the bookbuilding process, they could therefore overstate investors’ interest and price the IPO aggressively. However, rational IPO investors would recognize this adverse incentive and may choose not to cooperate in the building of the book. Instead, by implicitly committing to price support – which costs more, the more the offer price exceeds “true” share value – underwriters may convince investors that the issue will not be intentionally overpriced.

According to Benveniste, Busaba, and Wilhelm (1996), the main beneficiaries of price support should be therefore institutional investors who participate in bookbuilding.

Tax arguments

Another side of institutional explanations relies on tax advantages deriving from IPO underpricing. Rydqvist (1997) analyses this possibility in the context of Swedish IPOs. Before 1990, employment income was taxed much more heavily than what were capital gains. This had created an incentive to pay employees also in the form of appreciating assets. Therefore, in the event of an IPO, underpriced shares were allocated preferentially to the firm's own employees. In 1990, the Swedish tax authorities made underpricing-related gains subject to income tax, removing the incentive to allocate underpriced stock to employees. From this moment underpricing fell from an average of 41% in 1980-1989 to 8% in 1990-1994.

A similar argument is provided by Taranto (2003) who, studying U.S. taxation, found out that some tax laws can increase senior managers' incentive to underprice their company's IPO. In the U.S., holders of managerial or employee stock options are required to pay taxes in two steps. First, when they exercise the option, they pay income tax on the difference between the strike price and "fair market value". Second, when they eventually sell the underlying stock they acquired at exercise, they must pay capital gains tax on the difference between "fair market value" and the sale price. Since the capital gains tax liability is deferred, and since capital gains tax rates are typically lower than income tax rates, managers prefer this "fair market value" to be as low as possible. In U.S. tax law "fair market value" for options exercised in conjunction with an IPO indicates precisely the offer price, rather than the price that will prevail in the after-market. This in turn generates an incentive to underprice. Taranto's (2003) empirical results seem to be generally consistent with this argument, as they show that companies tend to more underprice, the more they rely on managerial and employee stock options.

2.4 – BEHAVIOURAL THEORIES

The last group of theories about IPO underpricing presented in this chapter deals with behavioural explanations. Before illustrating them one by one, it is fair to clarify that these models are still at a development and testing stage, even though seem promising. They born soon after the observation of the extraordinary underpricing level registered during the dot-com bubble, which, on average, reached the 65%: this extraordinary first-day initial return led some

researches to deem that there should have been some behavioural factors, besides theories analysed so far, explaining IPO underpricing. Behavioural theories indeed assume that underpricing is the result of investors' behavioural biases, due either to the presence of irrational investors or to issuers subject to behavioural biases. The most prominent behavioural insights are provided by informational cascades of Welch (1992), "investor sentiment" of Ljungqvist, Nanda, and Singh (2006), and prospect theory of Loughran and Ritter (2002).

Informational cascades

Welch (1992) found an IPO underpricing rationale in the idea of an "informational cascade" effect, by which investors assume their investment decisions sequentially. Later investors tend to ignore their own private information and simply act like previous investors: they condition their bids on the information inferred from the previous sales and on the purchasing decisions of earlier investors, thus creating an information cascade by following sequential sales. "As a consequence, if a few early investors believe that the offering is overpriced, they can swamp the information held by all other investors and doom the offering to fail. Or, if a few early investors believe that the offering is a bargain, they can create almost unlimited demand for this issue" (Welch, 1992, p.696). Therefore, subsequent investors interpret successful initial sales as an evidence of positive information owned by earlier investors, so that they are encouraged to invest as well, regardless of their private information. Since, following this mechanism, market power is completely demanded to earlier investors, being aware of the subsequent effect of their own decisions, they do not hesitate to ask a higher level of underpricing in return for committing to the IPO thus creating a positive cascade. Issuing firms need to underprice in order to create high demand from initial investors. In fact, Welch demonstrated that only underpriced offerings are successful, while overpriced ones use to fail: this fact would lead companies to apply a substantial level of underpricing when undertaking a public offering.

It is worth to underline that informational cascades theory is usually developed in fixed-priced offerings and not in bookbuilding contexts because, in this case, the underwriter has usually the possibility not to reveal the building of the demand of the book and moreover, the issuer can increase the offer size if demand becomes particularly high. Finally, Welch (1992) proved that, even though investors could freely communicate, investors are better off with cascades than with free communication: free communication aggregates all available information, therefore maximizing issuer's information disadvantage compared to investors. In addition, avoiding free

communication reduces the possibilities that a single investor's private information becomes widely known, thus decreasing the likelihood of IPOs failure.

Investor sentiment

Ljungqvist, Nanda, and Singh (2006) developed a model based upon the “irrational” or “sentiment” side of investors and on the positive response of issuing companies to such a behaviour. They observed that a large part of investors holds optimistic view about the future performance of IPO companies, mainly because these firms are usually quite young, have not yet reached a mature phase and are therefore hard to be valued. In this case, the issuer tries to maximize the sentiment investors' excess valuation over the fundamental value of the stock. However, launching a huge number of shares in the market will depress the price; thus, the optimal strategy for the issuer would be that of keeping the stocks in “inventory”, so to avoid a price falling towards their true fundamental value. Nevertheless, regulatory constraints on price discrimination and inventory holding do not allow the issuer to implement such a strategy directly. Therefore, the commonly followed approach consists instead in allocating offered shares to regular institutional investors, who in turn resale them to sentiment investors, at prices that aim at restricting the offering. On the other hand, since offerings producing a strong initial demand are in general risky, regular institutional investors require the shares to be underpriced, even in the absence of asymmetric information. Anyway, since the offer price exceeds the fundamental value of the stocks because institutional investors must gain as well from trading with sentiment investors, the issuing company takes advantage from this underpriced allocation.

Prospect theory

Loughran and Ritter (2002) elaborated an IPO underpricing theory which focuses on behavioural biases among decision-makers of issuing company rather than among investors. They state in fact that issuers do not “get upset” about leaving money on the table in the form of underpricing because they tend to sum the wealth loss due to large first-day return with the wealth gain deriving from the price net increase on retained shares in the aftermarket. “Prospect theory assumes that issuers care about the change in their wealth rather than the level of wealth. Prospect theory predicts that, in most situations occurring in the IPO market, issuers will sum the wealth loss from leaving money on the table with the larger wealth gain on the retained shares from a price jump, producing a net increase in wealth for preissue shareholders”

(Loughran and Ritter, 2002, p.414). In particular, Loughran and Ritter assume that decision-maker's initial valuation is reflected in the mean of the indicative price range reported in the issuing firm's preliminary prospectus. However, the IPO offer price is systematically different from this price range, either because of information revealed by institutional investors during the marketing phase or because of investment bank's influence on issuers' expectations. Nevertheless, as known from Hanley (1993) theory, the offer price is only partially adjusted to reflect upward revisions: therefore, large positive revisions from the offer price are associated with large initial price increase during the first day of trading. Consequently, assuming IPO issuers retain some shares of the company also after the IPO, they perceive positive revisions from the offer price as a wealth gain. At the same time however, they also perceive a positive initial return as a wealth loss when considering that shares could have been allocated at higher trading prices. But, if the perceived gain exceeds the perceived loss from underpricing, firm's decision-makers allow underwriter to leave a great amount of money on the table. Loughran and Ritter empirically demonstrated that the largest portion of IPO underpricing is in fact provided by those companies whose offer price is revised upward from what had been drafted in the preliminary prospectus in the extent that this "benefit" more than compensates the underpricing loss.

According to Loughran and Ritter also underwriters are better off when issuers behave as described above. They argue in fact that, even though underpricing seems to be costly to underwriters, since raising the offer price would raise also their revenues as gross spread is linked to IPO proceeds, they benefit in two ways from leaving money on the table. "First, it makes it easier to find buyers for IPOs, reducing their marketing costs [...]. Second investors will engage in rent-seeking behavior to improve their priority for being allocated shares in hot IPOs. Among the other things, they do this by trading with the brokerage arm of the underwriters and overpaying for commissions. This rent-seeking behavior on the part of potential IPO investors increases the revenues of the underwriter beyond that measured when focusing exclusively on the gross spread" (Loughran and Ritter, 2002, p.416). Therefore, Loughran and Ritter prospect theory concludes that, when demand becomes particularly and unexpectedly strong in the pre-selling phase, issuing firms weight the opportunity cost of underpricing as less relevant than direct fees paid in the form of gross spread, so that underwriters can in this way benefit from a less transparent compensation mechanism.

2.5 - FACTORS AFFECTING THE LEVEL OF UNDERPRICING

In addition to the different theoretical explanations trying to rationalize IPO underpricing presented in the previous paragraphs, other studies regarding the main factors and variables affecting the degree of positive initial return have been developed during time. Among them, the most important ones can be categorized in endogenous to the IPO firm, as the issue specific mechanism or firm's specific features, and exogenous economic factors, as market cycle or country specific regulatory constraints. Nevertheless, also in this case, empirical evidence shows that there is no unique model able to provide an exhaustive clarification to the phenomenon.

Issue specific factors

In the previous paragraphs it has been explained how the information disclosed in the prospectus and during the whole marketing phase is incorporated in the final offer price. However, some authors have noted that price perception of prospect investors results highly influenced also by some issue specific attributes, as the price mechanism chosen or the underwriter reputation.

Biais and Faugeron (2002) developed a model in which they showed that the bookbuilding process is successful in reducing the level of underpricing compared to fixed price and auction mechanism. As sustained by Benveniste and Spindt (1989), bookbuilding is able indeed to reduce the magnitude of the information asymmetry among investors and above all between the most informed investors and underwriters, by allowing flexible bids. According to Biais and Faugeron, this process enables the issuing company to actively contribute in the building of the final offer price by considering the whole collected information, and therefore ensures the final offer price to be really close to the intrinsic value of the firm as perceived by investors, thus reducing the level of underpricing. Ljungqvist, Jenkinson, and Wilhelm (2003) then, supported this view by adding that the positive effect that bookbuilding has in reducing the degree of underpricing outweighs the costs paid to underwriter in terms of fees and marketing compensation. Differently from Biais and Faugeron and many other theoretical studies sustaining that auction price mechanism, in contrast to bookbuilding, induces higher level of underpricing, greater volatility, and increased failure in attracting long-term investors, Iannotta (2010), assumes an opposite point of view. Exploiting Derrien and Womack (2003) findings, which showed that, in a sample of 264 French equity offerings conducted between 1992 and 1998, auctions exhibited less underpricing than bookbuildings, he states that auction

mechanism is able to minimizing the degree of positive initial return, since it guarantees the most recent market information to be included in the final offer price. Trying to explain why bookbuilding is the most popular process, in spite of its supposed inefficiency, he also adds that “if the issuers were to decide which mechanism adopt, they would probably choose to minimize underpricing, thus opting for auction [...]. However, underpricing is beneficial to investment banks and to their investor clients, who, differently from issuers, are repeated customers. As long as investment banks control the access to institutional investors, they will decide what mechanism to use and it will be bookbuilding, which allow[s] them discretion in allocation” (Iannotta, 2010, p.92).

Besides price mechanism adopted for IPO issuance, also the choice of the underwriter seems to have significant influence on the level of underpricing. As highlighted so far, issuers need to underprice in order to stimulate investors’ demand because of information asymmetry problems. However, some authors reported that information asymmetry can be reduced by hiring highly reputable and prestigious investment banks as underwriters: it has been found indeed that most reputable investment banks are able to price the issue more accurately and to better attract long term investors. Logue (1973) for instance, examining a sample of 250 IPOs, found significant differences in the average initial return between the IPOs performed by prestigious and non-prestigious investment banks: according to him, underwriter’s reputation is taken as a signal by potential investors that enables them to evaluate the risk associated with the IPO and the quality of the issuing firm. Consistent with this hypothesis, Carter and Manaster (1990) demonstrated that offerings followed by well reputed underwriters are associated with less risk and that therefore underwriter reputation is inversely related to positive initial returns. If an IPO issue is led by well reputed and prestigious underwriters in fact, investors will be confident about investing in that issue. The certification of the issue and the fairness of the offer price provided by well reputed investment banks have been confirmed also by Titman and Trueman (1986), who showed that first time issuers having favourable information about firm’s value tend to select prestigious underwriters and auditors: “when a firm sells shares for the first time its true value is imperfectly known by investors and the quality of the auditor and investment banker chosen by the firm’s owner provides information to the market about that value” (Titman and Trueman, 1986, p.159). Finally, Dunbar (2000) explained that most reputable underwriters tend to price the issue more accurately because fair underpricing of IPO influences the market share of investment banks.

Firm specific factors

Another group of endogenous factors affecting the degree of underpricing deals with issuing firm's specific characteristics such as age, size, ownership structure, competitive advantage or economic sector.

First of all, Ritter (1991) showed that the smaller is the offering, the higher is the initial return, and also demonstrated that there is a negative relation between firm's age, at the time of going public, and the level of underpricing. Indeed, the younger is the firm, the higher is the risk associated to the issue and therefore, the higher is the degree of underpricing. James and Wier (1990) then found that the existence of a borrowing relationship reduces the uncertainty about the value of the issuing firm's equity; the presence of consolidated credit relations indeed decreases the uncertainty and therefore the level of underpricing. Consistent with this view, An and Chan (2008) states that IPOs preceded by credit rating before going public, exhibit lower level of underpricing compared to firms without credit ratings.

Other studies focus instead on the effect of business group affiliation over IPO underpricing. Ghosh (2005), and later Marisetty and Subrahmanyam (2010), studying IPOs of Indian business group affiliated firms, empirically proved that IPOs belonging to business group affiliated firms show higher level of underpricing than standalone companies: according to them in fact, business group affiliated firms intentionally underprice their issues in order to be favoured by investors in subsequent equity issues. In contrast, Beckman and others (2001) observed that business group affiliated firms of Japan present lower degree of underpricing, both because they are expected to produce more stable earnings in the future and because they have stricter relations with main financial institutions, therefore reducing the extent of information asymmetry.

In addition to the aforementioned firm's specific factors, also the ownership stake of managers and other institutional investors is an important variable in explaining IPO underpricing. Similarly to Zingales (1995), Aggarwal, Krigman and Womack (2002) developed a model in which managers induce a certain level of underpricing in order to maximize their own wealth: an increased first day return indeed shifts the demand curve upwards, so that managers can strategically diversify the funds invested in the company at a higher price after the expiration of the lock-up period. Therefore, the degree of underpricing results positively influenced by the ownership stake held by managers. Other authors instead, studied the effect on IPO underpricing of the involvement of venture capital investors in pre-IPO ownership structure. Megginson and Weiss (1991), comparing equal numbers of venture capital backed IPOs to non-

venture capital backed IPOs conducted between 1983 and 1987, found that venture capital backed IPOs were less underpriced: venture capital firms' ability to assess company's value more accurately would indeed be associated with a certification effect. On the contrary, Lee and Wahal (2004) observed that venture capital firms are characterized by higher level of underpricing, supporting their so called "grandstanding hypothesis", according to which obtaining liquidity from invested funds by venture capital firms has a positive influence on their reputation and allows them to easily raise funds in the future. Therefore, IPOs underpricing would be strategically induced by venture capital investors in order to successfully exit their investment.

Finally, other studies investigated whether underpricing varies across different economic sectors. In particular, probably due to the extraordinary level of underpricing registered during the dot-com bubble (1999-2000), many of them focus on new technology companies underpricing. Lowry and Schwert (2002) showed that high-tech companies (such as biotech, computer equipment, electronics, and communications) exhibit higher level of underpricing than low-tech companies and also that non-technology firms are less underpriced. This evidence has then been confirmed by Loughran and Ritter (2004), who, after having studied a sample of 6,391 IPOs conducted in the period from 1980 to 2003, proved that tech and Internet related companies are associated to higher initial returns than non-technology firms. In addition, they showed that not only during the dot-com bubble the average level of underpricing for technological companies was much higher than for other firms (more than 80% and approximately 23% respectively), but also in the years before and after the bubble, tech and Internet related firms were characterized by higher level of initial returns. Finally, Gregoriou (2006, p.227) asserts that "IPOs of the new economy account not only for the most excessive underpricing, but also for the highest negative first-day return". All these findings can be justified by the fact that high tech industry is still relatively young and that, consequently, technological companies are perceived to be riskier. Indeed, this type of firms is difficult to be evaluated due to their large proportion of intangible assets and to their uncertain growth prospects; the risky nature of high-tech companies is also worsen by considering that they are frequently exposed to technology innovation and that their product cycles are usually of short duration. All these elements intensify information asymmetries between firms' owners and potential investors, consequently forcing issuers of high-tech companies to strongly underprice their IPOs in order to signal the true value of their firm.

Market timing

In addition to issue specific and firm specific factors, there are some external environmental factors affecting the level of IPO underpricing, such as the market timing chosen, the number of IPOs belonging to the same industry, the IPO volume or the volatility of the market. In particular, when examining which could be the proper moment to undertake an initial public offering, an issuer must take into consideration the existence of market cycles. Cycles exist in both the volume and the average initial return of IPOs. Observing Figure 1, it is possible to infer that the number of IPOs is not randomly distributed over time: high-volume periods are almost always followed by further high-volume periods.

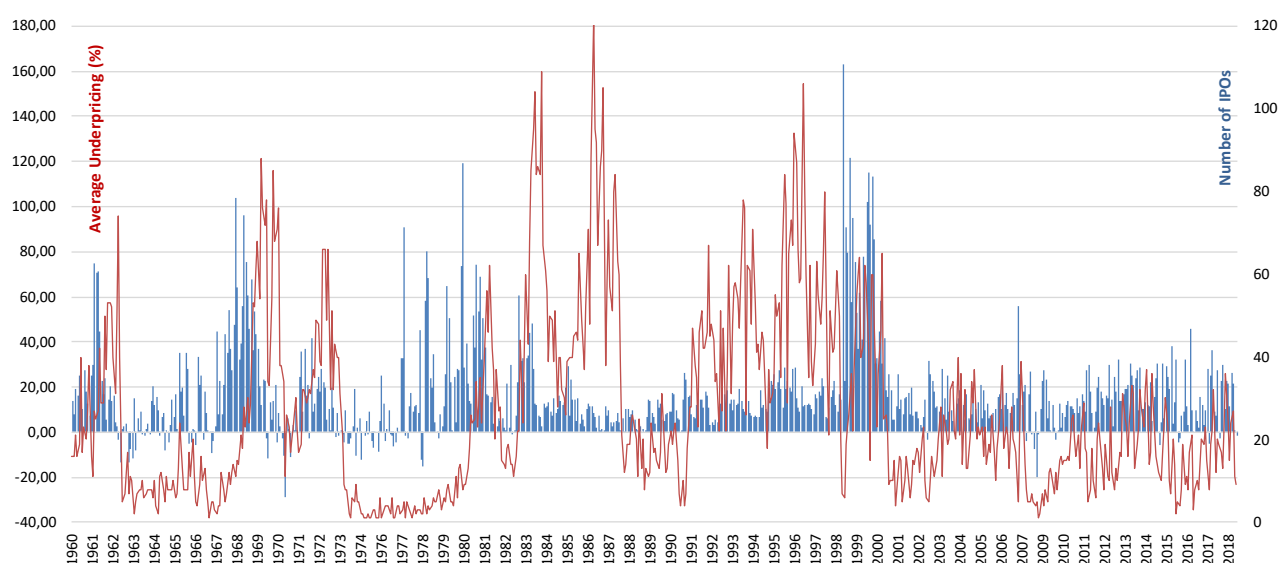


Figure 1: Number of IPOs and average initial return by month from 1960 to 2018 (source: own re-elaboration of Ritter's (2019) data available at <http://site.warrington.ufl.edu/ritter/ipo-data/>)

The same trend happens also for average initial returns: like IPO volume, also the degree of underpricing is cyclical and periods of high initial returns generally last for several months or even years. Therefore, market timing of IPOs is differentiated into “hot” and “cold” market periods. In hot market periods an unusually large number of firms undertake IPOs and average initial returns are particularly high (as can be noted from Figure 1, an “hot issue” market was the one of the late 1990s in the U.S.). Conversely, cold markets are characterised by low degree of underpricing, low issuing volume and few instances of oversubscription. Even though observing such market cycles is quite immediate, explaining the rationale behind the existence of “hot issue” market is still now quite complicated. Ritter (1984) introduced the “changing risk composition” hypothesis, which provides that riskier IPOs tend to be underpriced more than less risky IPOs. Thus, if there are periods in which firms going public are riskier than in other

periods, the period with riskier firms will be characterised by higher level of underpricing. Another possible explanation is linked to Ritter's (1991) idea that market goes through temporary "windows of opportunity": that is, periods in which IPOs can be sold at relatively high valuation multiple due to the over-optimistic investor behaviour. Of course, issuers try to successfully time their IPOs to take advantage of these "windows of opportunity" and exploit favourable market sentiment. Schultz (2003) then elaborated a pseudo market timing theory, according to which issuers decide to go public when they anticipate high probability of obtaining greater IPO price, so to maximize the issue proceeds. Therefore, based on their anticipation, IPOs should be launched when companies' valuation reaches the peak. However, most of the times issuers are not able to precisely identify this peak, and therefore offer prices of other IPO issues keep increasing until the market reaches its peak.

In conclusion, since the flow of IPOs is not constant neither in volume nor in average initial returns, issuing firms need to carefully choose the timing for their IPOs. As can be observed from evidence, private companies tend to go public during periods of high stock market valuations, while, in case of market downturn, they usually delay the issuance until favourable market conditions. In addition, issuing firms should consider that not only stock market valuations and market sentiments vary over time, but also stock exchange regulations, listing requirements, commissions paid to investment banks and other factors can change and influence the IPO timing decision.

Underpricing in different countries

The analysis conducted so far shows that underpricing is a robust phenomenon in the IPO market during time. Although most studies have analysed U.S. stock market and have focused on U.S. IPOs, empirical studies provide evidence about the presence of underpricing also in every other studied market. From Figure 2, that reports the level of IPO underpricing by country of listing, is possible to note that there are important differences in the average initial underpricing across countries. In non-European countries it is higher in Asian market than in more developed countries. China (157% in the period 1990-2017), India (85.2% in the period 1990-2017), Malaysia (51% in the period 1980-2018) and above all United Arab Emirates (270% in the period 2003-2010) and Saudi Arabia (approximately 240% in the period 2003-2011) have the highest average underpricing. In the U.S. average underpricing is much lower, about 17% (registered in the period 1960-2018), while it is even lower in Canada (6.4% in the period 1971-2017) and in Argentina (only 5.7% in the period 1991-2018). In European

countries, the average underpricing is very high in Greece (approximately 50% in the period 1976-2013) and Sweden (more than 26% in the period 1980-2015), while it is more limited in Italy (15% in the period 1985-2013), France (below 10% in the period 1983-2017) and Spain (9.2% in the period 1986-2018). These relevant cross-country differences are, above all, due to institutional differences that arise from binding regulations and contractual mechanisms. Regulatory environment indeed significantly differs across countries in terms of discretionary power allowed to underwriters, listing norms on IPO for the first day of trading, disclosure rules linked to the utilization of IPO proceeds or tax structure on capital gains: all these variables, added to factors illustrated along the description of the various theories, have a precise different effect on the level of IPO underpricing.

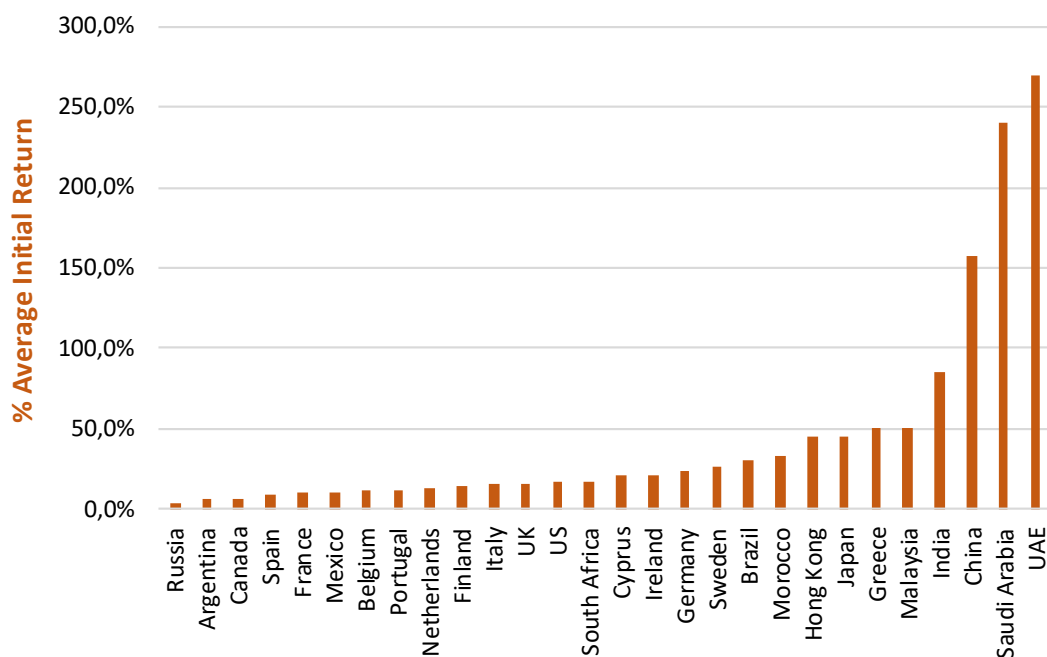


Figure 2: Average initial return by country in the period 1960-2018 (source: own elaboration of 2019 Ritter's data available at <http://site.warrington.ufl.edu/ritter/ipo-data/>)

CHAPTER 3 – IPO UNDERPRICING: AN EMPIRICAL REVIEW

While in the previous chapter all the main studies about IPO underpricing phenomenon have been briefly discussed from a theoretical point of view, this chapter will present only those empirical evidences which are deemed to be essential in order to better evaluate underpricing related to direct public offerings. Unfortunately indeed, no empirical study about the topic has produced relevant and statistically significant results precisely related to direct listings, probably because the shortage of companies adopting such a listing mechanism has not allowed to construct a dataset large enough; up to date, only two big technology companies have decided to go public through a DPO: Spotify Technology, whose offering performed on NYSE the April 3, 2018, and Slack Technology, which listed in NYSE as well the last June 20, 2019. For this reason, other evidences conducted on traditional IPOs, which could however reflect direct public offerings peculiarities, will be discussed. In particular, since, as already seen also in Chapter 1, DPOs seem to be a phenomenon directly linked with the coming of the Internet, the first section of this chapter will present the main findings around IPOs initial returns of technology and Internet-related firms; the majority of them focuses on analysing the Internet bubble period, but even those which examine wider period of times do highlight a higher level of underpricing associated to technology issuing firms. Then, because DPOs do not provide for the investment bankers assuming the role of underwriters, thus reducing or even deleting the information asymmetry between issuing firms and investment banks, the second section of the chapter will report some studies about self-marketed IPOs by investment banks: two studies out of three evidence that investment banks, when underwriting their own shares, use a lower level of underpricing. Third, as traditional initial public offerings are usually conducted through the mechanism of bookbuilding, which implies investment banks to discretionally deciding which institutional investors will be allocated offered shares, the most relevant empirical studies related to the efficacy of such a mechanism will be discussed: some of them show that not always IPO underpricing is used to extract valuable information from investors, but is sometimes used to compensate underwriters' recurring clients. Finally, since pricing setting seems to be a key variable in explaining IPO initial return, the last section will deal with some evidences about auction mechanism, which implies the offered shares to be underwritten from the investment bank as well, but at the same time no influence from underwriter on the offering price: being the form of offering that mostly reflect direct listings, it results to save a great amount of money compared to the traditional bookbuilding process.

3.1 – UNDERPRICING MEASUREMENT

Before presenting empirical results related to the issues illustrate above, it would be appropriate to deepen the knowledge about how IPO underpricing is usually computed. Even though the majority of empirical studies takes for grant the measurement method of such a phenomenon – normally referring to the most basic one – this section will provide a concise review about the possible alternative ways in measuring IPO underpricing, in light of the effects such a choice could have in determining the extent of “money left on the table”. Hence, the following paragraphs will discuss the Raw Initial Return formula, the Market Adjusted Initial Return variation and the Opportunity Cost of Issuance alternative.

Raw Initial Return formula

In quantitative terms, IPO underpricing is generally defined as the percentage change from the offer price to the closing price on the first day of trading¹⁷. Hence, in most of the empirical researches about IPO underpricing, the initial performance on the first day of trading is computed using the conventional measurement of the Raw Initial Return (RIR) formula, structured as follows:

$$RIR_{i,t} = \frac{P_{i,1} - P_{i,0}}{P_{i,0}}$$

where $RIR_{i,t}$ is the raw initial return on the first day of trading; $P_{i,1}$ is the first day of trading closing price available on the stock exchange website of the company’s listing market; and $P_{i,0}$ is the final offer price or issue price of the company i , disclosed in the formal registration statement of the offering.

The reason why this formula uses the closing first day price in order to measure IPO underpricing is that closing price should reflect the price equilibrium determined by the demand and supply forces on the market at the end of the first day of trading, i.e. after the initial trading has stabilized. Of course, Raw Initial Return formula provides with an underpricing estimate in percentage terms; however, IPO underpricing is normally computed in monetary terms simply multiplying the difference between the first day closing price and the offer price by the number of shares offered in the IPO, so to have a measure of the real amount of money left on the table.

¹⁷ Usually, offer price is in general compared to the closing price in the first day of trading. However, different references have been taken into consideration during time: mainly, Uhlir (1989) and Carter and Manaster (1990) used respectively the official market clearing price and the closing bid price two weeks after the offering.

Market Adjusted Initial Return formula

Raw Initial Return formula could be appropriate in computing IPO underpricing only if certain specific conditions are satisfied: in particular, it generates trustworthy results in cases of perfect market conditions, when there is no opportunity cost and no time lag between the closing date of the registration period of the offering and the first day of effective trading. However, under imperfect market conditions, the Raw Initial Return formula is adjusted in order to take into account the general performance of the stock market in such a time lag. Hence, under Market Adjusted Initial Return (MAIR) formula, IPO underpricing is calculated as follows:

$$MAIR_{i,t} = \left[\frac{P_{i,1} - P_{i,0}}{P_{i,0}} - \frac{MI_{i,1} - MI_{i,0}}{MI_{i,0}} \right]$$

where $MAIR_{i,t}$ is the market adjusted initial return at the first day of IPO effective listing; $MI_{i,1}$ is the market index at the end of the first day of effective listing of the company i ; and $MI_{i,0}$ is the market index at the end of the shares subscription period of the company i .

Empirical evidence about IPO underpricing shows that Market Initial Adjusted Return formula is in general more accurate than Raw Initial Return formula in measuring IPO underpricing, even in cases when effective listing begins immediately after the closing of the registration period: the first day closing price indeed may be particularly high with respect to the offer price just because the whole stock market performance has risen after the closing of the pre-issue activities; in these cases, adjusting for the market overall return allows to obtain more reliable results. Moreover, the Market Initial Adjusted Return formula could be also interpreted in a different way when considering the market initial return component as one of the alternative investment opportunities an investor could have undertaken instead of choosing for company i : doing so, he may be able to precisely assess the extent of underpricing compared to an alternative generic investment. Of course, also this formula measures IPO underpricing under percentage terms: in order to assess the whole amount of “lost” money, the difference between the numerators of the Market Initial Adjusted Return formula must be multiplied by number of shares issued in the offering.

Opportunity Cost of Issuance formula

Opportunity Cost of Issuance (OCI) formula is an alternative method to calculate monetary IPO underpricing, particularly useful in determining company’s owner cost of issuance beyond direct fees. First developed by Dolvin and Jordan in 2008, and then further improved by Dolvin

in 2012, the calculation was basically built on the assumption that commonly used measurements of IPO underpricing, as those illustrated above, are not appropriate in measuring the magnitude of this opportunity cost suffered by pre-existing shareholders, since they fail to take into account the share structure of the offering. Dolvin argues indeed that, while underpricing is normally computed using the total number of offered shares, without specifying which nature these offered shares are, a more accurate estimate of IPO underpricing from the company's owner perspective could be obtained by distinguishing between primary and secondary shares. Underpriced primary shares, i.e. newly created shares used to raise fresh capital, will dilute company value at the expense of pre-issue shareholders; underpriced secondary shares, i.e. shares previously owned by pre-issue shareholders and sold to the market in order to exit the company, will instead lower the sale gain realized by the selling shareholders. The general approach threat both types indifferently. However, Dolvin claims that, normally, company's owners do not sell the total amount of their own shares in an IPO: they typically retain the largest part of them and limit to offer a smaller quantity. Hence, taking into consideration IPOs share structures, he came to elaborate the following formula:

$$OCI_{i,t} = \frac{(P_{i,1} - P_{i,0}) * (shares\ offered)}{[P_{i,1} * (existing\ shares) + (P_{i,1} - P_{i,0}) * (primary\ shares)]}$$

where $OCI_{i,t}$ is the opportunity cost of issuance of company i in the first day of trading; $P_{i,1}$ and $P_{i,0}$ are defined as above; *shares offered* are the total amount of shares offered in the IPO; *existing shares* is the number of shares prior to the offering; and *primary shares* is the amount of newly created shares offered in the IPO. In particular, $P_{i,1} * (existing\ shares)$ represents the pre-listing value of the company at the first day of trading closing price, already net of the dilution effect coming from the issuance of newly created shares; $(P_{i,1} - P_{i,0}) * (primary\ shares)$ instead is the amount of the dilution. Therefore, appealing to Opportunity Cost of Issuance formula, IPO underpricing results still positive but much more reduced. Dolvin justifies this results by explaining that the company's entrepreneur, in general, still owns some shares also after the offering, which he could sell at the current market price once the lockup period expires; for this reason he is willing to sustain the opportunity cost of issuance "to create a liquid market for what is otherwise a very illiquid investment" (Dolvin, 2012, p.65).

3.2 – UNDERPRICING AND INTERNET-RELATED FIRMS

As already anticipated in previous chapters, the new millennium has been characterized by the so-called “Internet” bubble period, during which a large number of high-technology and Internet-related firms went public, registering a record in the history of IPO initial returns. From this point onward many studies have focused their attention on figuring out factors behind this excess underpricing, trying to understand if, indeed, the listing companies belonging to the “new economy” play a role in explaining it. The majority of their results have highlighted a strong positive relation between this type of IPOs and first-day initial return. Hence, since it is fundamental to take into account this anomaly when analysing Internet-related IPOs, the following paragraphs will report the empirical findings around the issue, referring to authors like Loughran and Ritter (2004), DuCharme, Rajgopal and Sefcik (2001), Arosio, Giudici and Paleari (2000).

Loughran and Ritter

In their famous paper entitled “*Why has IPO underpricing changed over time?*”, Loughran and Ritter (2004) try to explain the reasons behind observed high-frequency movements characterizing IPO underpricing: from 15% in the period 1990-1998, to the extraordinary level of 65% during the Internet bubble years 1999-2000, reverting back to 12% during 2001-2003. To do so, they study a large sample of 6,391 U.S. IPOs undertaken between 1980 and 2003, mainly analysing it into four sub-periods: 1980-1989, 1990-1998, 1999-2000 corresponding to the Internet bubble, and 2001-2003, reflecting the post-bubble years. They then compute the effect of various firm-specific and issue-specific characteristics on the average initial return, among which firm’s proceeds, assets, sales, age or underwriter prestige; nevertheless, for the aim of this elaboration, only results regarding industry segmentation are reported; in particular, Loughran and Ritter distinguish analysed firms into two basic “industries”: technology and Internet-related, and non-technology. As shown in Table 1, the collected data highlight a systematically higher average initial return for the technology and Internet-related firms: being only 4 percentage points higher than that of non-technology firms during 1980s (10.2% versus 6.2%), tech and Internet-related firms’ underpricing doubles in the 1990s (22.2% against 11.3%), is almost four times greater during the Internet bubble (80.6% compared to 23.1%), reverting to a more acceptable level in the years following the bubble (16.4% versus 9.8%).

IPOs sample	6,391 U.S. IPOs		
Analysed period	1980 - 2003		
Underpricing calculation	RIR		
Main results		N	Return
1980-1989	tech and internet-related	576	10.2%
	non-technology	1,406	6.2%
1990-1998	tech and internet-related	1,081	22.2%
	non-technology	2,315	11.3%
1999-2000	tech and internet-related	585	80.6%
	non-technology	218	23.1%
2001-2003	tech and internet-related	60	16.4%
	non-technology	150	9.8%

Table 1: Tech and non-technology IPOs initial returns during 1980-2003 by sub-periods (source: own re-elaboration of Loughran and Ritter data, 2004)

As displayed in Table 2, Loughran and Ritter regression further underlines additional effects of young technology and Internet related firms on IPO average initial return: first of all, technology-related companies maintain across sub-periods positive and significant effects on IPO underpricing, particularly high during the bubble (16.98%); Internet-related firms instead present a strong positive relation on average initial return only in the 1990s (31.29% and 25.02%), corresponding to the proliferation of companies offering Internet services, while they show an even negative relation in in the 1980s and in the first years of new millennium (-4.06% and -3.25%, respectively); issuing company's age has finally a constant negative effect on first-day initial return (averaging 1 percentage point).

Effects on first-day initial return	Tech	Internet	Age
1980-1989	2.44	-4.06	-0.89
1990-1998	5.46	31.29	-1.31
1999-2000	16.98	25.02	-0.97
2001-2003	5.26	-3.25	-1.35

Table 2: Effects of “tech”, “Internet” and “age” variable on IPO initial return by sub-periods during 1980-2003 (source: own re-elaboration of some empirical results by Loughran and Ritter, 2004)

Although not being the main objective of their empirical analysis, Loughran and Ritter contribute to put into evidence the general positive relation between young technology and Internet-related issuing companies and the degree of IPO underpricing resulting from their equity issues. As anticipated in the theoretical section, the risky nature of this type of firms, often being established for a very few time, having a large percentage of intangibles and offering short-duration products, complicates underwriters' and investors' equity valuation, forcing issuing companies to strongly underprice their offerings in order to be competitive and signal their quality. Therefore, the change in the risk composition of companies going public,

due to more or less Internet and technology related firms undertaking IPOs, represents a partial but significant explanation of IPO underpricing variation during time.

DuCharme, Rajgopal and Sefcik

DuCharme, Rajgopal and Sefcik (2001) focus instead their entire analysis on directly examining the reasons behind Internet firms' IPO underpricing. They identify 342 Internet companies going public in the U.S. stock market between 1988 and 1999; in order to obtain consistent results, they further select a comparable sample of 249 "matched" non-Internet IPOs, whose offer date had to fall within a 30 day range around the Internet IPO and whose total proceeds had to fall within a lower bound of 50% and an upper bound of 150% of the registered proceeds of the Internet IPO. Table 3 confirms that the mean initial return for Internet IPOs is substantially higher than that of other firms: although showing similar offering parameters in terms of mean number of offered shares and average offer price, Internet IPOs underpricing reaches the extraordinary level of 74.9% compared to the more modest 31.4% of non-Internet IPOs¹⁸. Furthermore, even though the mean total proceeds registered by Internet IPOs (\$70.9 million) is not much larger than proceeds collected by non-Internet IPOs (\$64.5 million), Internet IPOs left on the table more than \$62 million per issuing firm, while non-Internet IPOs mean money left on the table is just \$22 million. In total, Internet issuing firms seem thus to have sustained an indirect cost of issuance four times greater than that of comparable non-Internet IPOs (\$21.3 billion compared to \$5.5 billion, respectively).

IPOs sample	342 Internet IPOs vs 249 non-internet IPOs		
Analysed period	1988 - 1999		
Underpricing calculation	RIR		
Dataset		Internet IPOs	non-Internet IPOs
	initial return	74.9%	31.4%
	shares offered (ml)	4.683	4.624
	offer price (\$)	14.186	12.916
	first day closing price (\$)	27.026	17.683
	money left of the table (\$ ml)	62.193	22.062
	tot money left on the table (\$ ml)	21,270	5,494

Table 3: Descriptive statistic of DuCharme, Rajgopal and Sefcik analysis (source: own re-elaboration of DuCharme, Rajgopal and Sefcik data, 2001)

¹⁸ The average underpricing of non-Internet IPOs exceeds the historical average underpricing of 15-20% (Ritter 1991) partly because the matched non-Internet sample includes a number of telecommunication firms which could arguably be considered Internet-based firms also.

The second part of DuCharme, Rajgopal and Sefcik analysis aims at individuating the factors influencing Internet IPOs initial returns. Some of the outcoming results are quite counterintuitive and opposite with respect to the explanations provided by theoretical literature. First, they find that the need to return to the capital market to undertake a seasoned equity offering is positively associated with first initial return of Internet-related firms, but not of non-Internet IPOs (the coefficients in the regression are equal to 31.1% and 6.5%, respectively); Internet-related firms could strategically decide to underprice their IPO: by doing so, they could indeed gain enough market share to later induce investors in participating in subsequent financing rounds. Second, empirical evidence shows that underwriter's high quality does increase first-day return of Internet-related firms, but not of non-Internet IPOs (the coefficients in the regression are equal to 43.5% and 6.0%, respectively): the involvement of reputable investment banks in Internet IPOs seems to have a positive effect on the level of underpricing; authors rationalize the astonish result by referring to Loughran and Ritter (2002) recent insights: taking advantage of Internet firms inexperience and uncertainty, underwriters may underprice Internet stocks so to lower marketing costs to place shares in the market or to increase investors' commissions in exchange of guaranteeing them quick and elevated profits in hot IPOs. Finally, DuCharme, Rajgopal and Sefcik demonstrate that media exposure pre-IPO is positively associated with underpricing of Internet IPOs (+0.7%): the result suggests that media exposure maybe captures information about pre-IPO demand that is not incorporated by underwriters during the roadshow process.

Arosio, Giudici and Paleari

Arosio, Giudici and Paleari (2000) totally dedicate their efforts in analysing Internet stocks underpricing as well, but, differently from DuCharme, Rajgopal and Sefcik, they concentrate on Internet bubble period. They study a sample of 86 Internet IPOs¹⁹ listed between January 1999 and May 2000 on two European secondary stock exchanges: the EASDAQ, whose rules are very similar to those of NASDAQ, a Belgian stock market founded in the 1996 by U.S. and European financial intermediaries aiming at attracting international oriented fast growing high-tech companies; and Euro-NM, a network of regulated national markets dedicated to growth companies, constituted by German *Neuer Markt*, by French *Nouveau Marché*, by Belgian Euro-

¹⁹ They identify an "Internet-related" firm as the one that would not exist without the Internet; they therefore exclude from the sample companies simply selling their products on the Web; most of the firms included in the sample sell Internet software and services, some of them provide Internet business consulting while just a few provide Internet access; there are also Internet trading companies, portals, on-line auctions, music, art and financial information.

NM Belgium, and by the Italian *Nuovo Mercato*, each one having its own country requirements. This choice is dictated by the fact that, compared to the official market standards, the rules of the secondary EU markets are less restrict, so to facilitate Internet start-up firms²⁰. Markets' data regarding mean initial return and money left on the table are summarized in Table 4: the whole sample shows a relevant initial return equal to 76.43%, extraordinary high (160%) in the Euro-NM Amsterdam because of the presence of a single IPO, and decisively lower in the Euro-NM Belgium (30.54%). Furthermore, more than 4,6 billion Euro were left on the table by European Internet IPOs between 1999 and 2000.

Market	N of IPOs	Mean Initial Return	Total money left on the table (ml €)
Neuer Markt	60	+77.11%	3,308.396
Nouveau Marchè	14	+84.20%	388.227
Nuovo Mercato	5	+50.16%	830.526
Euro-NM Belgium	2	+30.54%	7.571
Euro-NM Amsterdam	1	+160%	60.000
EASDAQ	4	+73.94%	77.779
Whole sample	86	+76.43%	4,672.499

Table 4: Descriptive statistic of Arosio, Giudici and Paleari analysis (source: own re-elaboration of Arosio, Giudici and Paleari data, 2000)

In this context, Arosio, Giudici and Paleari try therefore to investigate the correlation between Internet IPOs initial returns and firm specific factors. According to authors in fact, Internet stocks are subject, on one side, to investors' euphoria due to the possibility of diversifying their portfolios and maintaining an option on future growth opportunities; on the other side, uncertainty surrounding Internet companies value affects IPO valuation: intermediaries and investment banks may fail to correctly price Internet shares, because they continue to apply evaluation techniques appropriate only for "old economy" companies, and not for young Internet-related companies whose short-term profitability is usually scarce and whose assets are essentially intangibles not included in the balance sheet figures. Dividing determinants of money left on the table into three categories (proxies of the market and investor sentiment, firm-specific accounting data and IPO-specific data), authors find the most interesting results in the accounting variables. In particular, as shown in Table 5, while assets composition seems to be irrelevant²¹, sales amount is negatively related to Internet IPOs underpricing (-10.8%), while

²⁰ For instance, offered shares must represent a fraction of the equity capital which is lower than required by primary markets, and the minimum offering size is smaller, too; in most of these secondary markets then only one set of published financial statements is required before the offering.

²¹ The coefficient of 0.5175 is not statistically different from zero at any level.

net profits show a small but positive effect on Internet IPOs initial returns (+0.09%). This evidence suggests that the market is not concerned about the capital assets of the IPO firm, since Internet investments are considered as strategic options on future growths; however, sales are considered as a cash source, in order to finance R&D, marketing and skill costs and reduce uncertainty about the firm's success in competing on the Internet business; hence, when sales are satisfying, the requested underpricing may be lower. On the contrary, Internet companies' profits may enhance underpricing because, increasing the probability of the firm's survival, they increase the duration and value of the entry option in the Internet business. Since the traditional valuation methods of IPOs rarely take into account these strategic elements, underpricing is forced to be higher.

Variables	Effects on Internet IPOs initial return
market performance	1.0762
market volatility	0.0053
N of IPOs in the market	-0.0577
assets' value	-0.0185
intangibles/tot assets	0.5175
total revenues	-0.1081
net profit	0.0009
leverage	0.0002
offer price	-0.3535

Table 5: Effects of different variables on Internet IPO initial return (source: own re-elaboration of Arosio, Giudici and Paleari empirical result, 2000).

In conclusion, according to Arosio, Giudici and Paleari (2000, p.21) “public information, i.e. accounting data from the IPO prospectus, do have a role (although unclear) in investors' judgement. The assets size and typology and the debt ratio are not related to the initial underpricing, thus suggesting that information asymmetry is reduced by book building procedures. On the contrary data about sales and profits are found to be relevant in mispricing IPOs. Therefore, we posit that the market recognizes as value drivers for Internet stock some information that the offering party neglects in pricing the IPO”.

3.3 - UNDERPRICING ARISING FROM PRINCIPAL-AGENT ASYMMETRIES

One of the fundamental question of this thesis is whether IPO underpricing is influenced or not by the presence of investment banks – in the role of underwriters – in the process of going public. For this reason, this section will present the main empirical tests on Baron model hypothesis. As illustrated in Chapter 2, Baron model assumes that, since investment banks are better informed than the firm itself about capital market conditions, IPO issuers deliberately delegate the offer price decision to the banks. However, because of the issuer’s inability to perfectly monitor the investment bank’s distribution effort, offer price is usually set lower than would have been in the absence of information asymmetry. Various authors tried to empirically test the validity of this assumption, mainly focusing on the comparison between self-marketed and not self-marketed IPOs of investment banks, even though without coming to a univocal result: the most significant ones are Muscarella and Vetsuypen (1989), Chen, Fok and Kang (2009), and Regalli (2013).

Muscarella and Vetsuypen

Muscarella and Vetsuypen (1989) are usually introduced in anthesis to Baron’s theory. Indeed, analysing a sample of 38 U.S. self-marketed investment banks IPOs between 1970 and 1987 – that is, initial public offerings of banks who participated in the distribution of their own shares – they find that the sample is characterized by a notable level of underpricing as well, as illustrated by empirical results in Table 6.

IPOs sample	38 investment banks self-marketed IPOs		
Analysed period	1970-1987		
Underpricing calculation	MAIR		
Main results		N	mean initial return
	all self-marketed IPOs	38	7.12%
	<i>of which lead manager</i>	17	13.23%
	<i>of which not lead manager</i>	21	2.17%

Table 6: Descriptive statistic of Muscarella and Vetsuypen analysis (source: own re-elaboration Muscarella and Vetsuypen data, 1989)

Among the 38 investment banks going public in the considered period, 17 of them acted as lead managers of their own IPO, while the remaining 21 played the role of co-managers, distributors or selected dealers. The results obtained, on average, suggest that IPO underpricing is a pervasive phenomenon also removing the information asymmetry factor between issuer and investment bank. Self-marketed IPOs of U.S. investment banks are indeed characterized by statistically significant shares underpricing of 7.12%, on average not lower than the level of

underpricing experienced by comparable IPOs. Furthermore, distinguishing among self-marketed IPOs in which the issuing bank acts as lead manager of the offering, thus exercising a decisive influence on offer price, and those in which the issuing bank does not assume this crucial role, Muscarella and Vetsuypen find out that IPO initial return of the former is clearly higher than IPO initial return of the latter (respectively 13.23% versus 2.17%). This evidence may indicate that lead manager investment banks deliberately underprice initial public offerings also when they lead their own offerings.

Chen, Fok and Kang

Following Muscarella and Vetsuypen work, Chen, Fok and Kang (2009) recently re-examine the validity of Baron model. In order to test Baron’s hypothesis, they analyse IPO underpricing in a quite extended period of time, from 1980 to 2003, and they performed two different comparisons: the first test essentially represents an extension of Muscarella and Vetsuypen empirical evidence, involving 41 self-marketed and not self-marketed investment banks IPOs; the second test instead compares the same investment banks self-marketed IPOs of the first sample to 52 IPOs led by these banks in the same period.

As summed up in Table 7, the first empirical evidence does not reject Baron’s theory. 14 self-marketed IPOs show a mean initial return of 13.98%, even higher than the mean initial return registered by the remaining 27 not self-marketed banks IPOs (12.75%).

	Test 1		
IPOs sample	41 investment banks IPOs		
Analysed period	1980-2003		
Underpricing calculation	RIR		
Main results		N	mean initial return
	all investment banks IPOs	41	13.17%
	<i>of which self-marketed</i>	14	13.98%
	<i>of which not self-marketed</i>	27	12.75%

Table 7: Descriptive statistic of the first analysis by Chen, Fok and Kang (source: own re-elaboration of the main empirical results of Chen, Fok and Kang, 2009)

The second test instead compares the 14 self-marketed IPOs to a sample of “traditional” IPOs led by themselves. Chen, Fok and Kang identify 52 comparable IPOs selecting those undertaken six months before and after the self-marketed IPO and those having similar offer size. As shown in Table 8, IPOs led by self-marketed underwriters show significant higher level of initial return: 17.6% compared to nearly 14%, suggesting that investment banks tend to mitigate IPO underpricing level when involved in their own shares offering.

		Test 2	
IPOs sample	14 self-marketed investment banks IPOs vs 52 IPOs they led		
Analysed period	1980-2003		
Underpricing calculation	RIR		
Main results		N	mean initial return
	self-marketed IPOs	14	13.98%
	IPOs led by the self-marketed underwriter	52	17.61%

Table 8: Descriptive statistic of the second analysis by Chen, Fok and Kang (source: own re-elaboration of the main empirical results of Chen, Fok and Kang, 2009)

Despite the significant positive underpricing also characterizing self-marketed banks IPOs, Chen, Fok and Kang conclude that Baron's model cannot be rejected: the results they obtained support indeed the hypothesis that, when investment banks are involved in their own IPO, the expected level of underpricing is lower because in this case the asymmetric information problem between the investment bank and the issuer is eliminated.

Regalli

Differently from previous studies, Regalli (2013) decided to test information asymmetry between issuer and investment bank analysing the Italian stock market, traditionally oriented towards financial intermediaries. Therefore, he took all the IPOs undertaken on the Italian market between 1985 and 2007²²: among them, approximately 57% of the firms belongs to the "industry", 22% to the "services" and 21% to the "financial" sector.

Underpricing of IPOs undertaken by banks of the sample is practically equal to zero (1.6%). However, as shown in Table 9, when distinguishing between self-placed, or self-marketed banks IPOs (amounting to 11 observations) and not self-placed banks IPOs (6 observations), mean initial returns are completely different: while not self-placed banks IPOs show an average underpricing of 13.6%, quite in line with the average initial return of other types of firms, self-placed banks even register a mean overpricing of 5%. Thus, only those banks directly involved in their own offering show underpricing below the mean.

²² He excluded listings without an initial public offering, listings following extraordinary operations (with previously listed companies), as well as simple transfers to the main market from other national or international markets; re-admissions of previously suspended shares, listings of shares other than ordinary shares, and operations listed on the "Mercato Ristretto" and "Mercato Expandi" and on the "Nuovo Mercato".

IPOs sample	213 Italian banks and non-banks IPOs		
Analysed period	1985-2007		
Underpricing calculation	logarithmic MAIR		
Main results		N	mean initial return
	financial firms	45	10.4%
	<i>of which self-placed banks</i>	11	-5.0%
	<i>of which not self-placed banks</i>	6	13.6%
	services firms	46	4.9%
	industrial firms	122	11.3%

Table 9: Descriptive statistic of Regally analysis (source: own re-elaboration of Regalli empirical results, 2013)

Regalli strengthen this first demonstration of Baron's theory further comparing self-placed banks IPOs with other firms IPOs that went public in the same years: in this way, possible distortions arising from market trends in the years in which self-marketed IPOs did not take place are avoided. Empirical evidence highlights that, while the 11 self-placed banks IPOs present an overpricing of 5%, the 77 IPOs which took place in the same years show an average initial return of 12.1%. Since Italian stock market is highly intermediary-oriented, Regalli concludes that Baron's theory may be reasonably validated when considering the difference in the level of underpricing of Italian self-placed banks and other Italian IPOs.

3.4 - UNDERPRICING RELATED TO SHARES ALLOCATION

As described in Chapter 2, according to Benveniste and Spindt (1989) theory, bookbuilding pricing mechanism would allow investment banks to overcome information asymmetry issues with respect to informed investors: leveraging on their discretion in allocating shares indeed, underwriters would be able to extract valuable information from informed investors by compensating them through the allocation of larger fractions of underpriced shares. In this framework, table left on the table becomes fundamental in order to induce investors to reveal positive information about the issue. In recent years, more and more attention has been dedicated to criteria by which IPO shares are allocated among investors. Given the large amount of money left on the table in fact, public opinion has started to mistrust the fairness of underwriters' allocation policies and has therefore begun to deepen the research around the topic. Even Ritter and Welch (2002, p.35), who have been studying IPOs and related underpricing for many years, in their paper entitled "*A review of IPO activity, pricing and allocations*" underline the interesting and promising results such a research could bring: "The allocation of shares by underwriters is perhaps the most active area of current IPO research. [...] To date, empirical research has been limited due to the lack of micro-level data on share

allocations in the U.S. As this data becomes available, we expect that it will be able to shed light on many questions”. Hence, this section will present some of the most relevant empirical results about the relation between IPO underpricing and shares allocation, as documented by authors like Cornelli and Goldreich (2001), Jenkinson and Jones (2004), Aggarwal, Prabhala and Puri (2002), Ljungqvist and Wilhelm (2002). On average, they all conclude the preferential allocation granted to regulatory institutional investors, while they all do not completely agree on the superior information gathering through such a mechanism.

Cornelli and Goldreich

Cornelli and Goldreich (2001) examine the impact of several factors on the “normalized rationing measure”, which simply represents the ratio of percentage allocation to percentage bids. They analyse a sample of 39 international equity issues²³ that took place between 1995 and 1997, all having the same global bookrunner European investment bank; sample’s main features are summarised in Table 10.

IPOs sample	39 equity issues led by the same European investment bank	
Analysed period	1995-1997	
Issuers characteristics		Mean
	Sales (ml \$)	2,382
	Earnings (ml \$)	184
	Age (years)	36
	Offer Price (\$)	37.1
	Underpricing (%)	3.4

Table 10: Descriptive statistic of Cornelli and Goldreich analysis (source: own re-elaboration from Cornelli and Goldreich data sample, 2001)

Table 11 shows the main results of their research on 11,077 considered bids. First of all, they find that larger bids are favoured compared to small bidders: all else being equal, percentage allocation increases by 24% for bids in the largest size quarter, probably because they are better informed. Bids that find in the second largest quarter are also favoured, but just for a 5%; investors submitting large bids are interpreted as being less concerned about liquidity and control issues. Bookrunners then award more shares to investors who submit price limit bids than to investors that just indicate a limit quantity of shares through strike bids (+19% and +4% in the normalized rationing, respectively). Also bids revisions are favoured (+8%), since they are interpreted as providing additional information about the issue as it arises over time. Bids

²³ Of the 39 issues, 23 are initial public offerings (IPOs) and 16 are seasoned equity offerings (SEOs). Moreover, 14 of the 39 issues are privatizations (both IPOs and later tranches).

submitted early in the bookbuilding phase instead (among the first 25%) are penalized (-5%) because perceived as less informative: information about the issue changes along the bookbuilding period, thus later bids are probably better informed. Furthermore, high frequency bidders, those who usually participate in a large number of issues, receive favourable treatment from book-runners since they are regular investors (+20% of allocation ratio to bidders who participate in more than 10 issues and +9% for those who participate in more than 3 issues). Investors having the same nationality of the issuing company are also favoured compared to foreign institutions (+9%). Finally, the variable that most affects the normalized rationing is whether the bid is submitted to the bookrunner or to another investment bank of the syndicate: in the first case the percentage allocation rises to 34%; this could be quite intuitive considering that, in deciding allocations, the bookrunner would tend to maximize its own interest rather than the client's, by favouring bids directly submitted to its sales force so to increase its own compensation in the form of higher brokerage fees. Cornelli and Goldreich analysis, therefore, would confirm Benveniste and Spindt theory suggesting discretionary allocation of shares as a mechanism to compensate informative investors.

Results	
Largest size quartile	+24%
Second largest size quartile	+5%
Limit bid	+19%
Currency strike bid	+4%
Early bid (first 25%)	-5%
Revised bid	+8%
High frequency (more than 10 issues)	+20%
Medium frequency (between 3 and 9 issues)	+9%
Home investor	+9%
Bid submitted to the bookrunner	+34%
Adj. R-squared	13.6%
Number of bids	11,077

Table 11: Factors affecting IPO shares allocation (source: own re-elaboration of empirical results from Cornelli and Goldreich data, 2001)

Jenkinson and Jones

Following Cornelli and Goldreich (2001), Jenkinson and Jones (2004) try to empirically analyse the factors affecting investors bids' allocations; however, their conclusions are slightly different. They test a sample of 27 initial public offerings conducted between 1996 and 2001, whose issuing companies are all European and greatly heterogeneous in terms of industry. Institutional allocations represent, on average, the 84% of the market offering (the remaining being retail offerings), although in the majority of the cases the institutional allocation accounts

for the entire offerings. Considered bidders instead come from 44 countries, although most of them are clustered in a few countries. Other quantitative characteristics of the issuing companies as mean sales, assets and post-money capitalization are detailed in Table 12.

IPOs sample	27 IPOs of European issuers	
Analysed period	1996-2001	
Issuers characteristics		Mean
	Sales (ml \$)	130
	Total assets (ml \$)	167
	Gross IPO proceeds (ml \$)	72
	Post money market cap. (ml \$)	230
	Institutional offerings	84%

Table 12: Descriptive statistic of Jenkinson and Jones analysis (source: own re-elaboration from Jenkinson and Jones data, 2004)

Jenkinson and Jones analysis main results are reported in Table 13. Similar to Cornelli and Goldreich, they find that largest bids are in general favoured by bookrunners (+40% in the normalized rationing for top quartile size bids and +20% for second largest size quartile). Consistently with the precedent work, they also prove that regular investors of a particular investment bank are generally treated more favourably (+34% in the normalized rationing for high frequency investors and just +5% for medium frequency investors). Another common result to both analyses is the positive relation between bids submitted directly to bookrunner and allocation ratio: in Jenkinson and Jones, this factor increases normalized rationing by even 55%. However, differently from Cornelli and Goldreich, they find little evidence that more informative bids receive preferential allocation: bids containing a price limitation increase normalized rationing by 15%, bids specifying a particular quantity by just 6%, and those which are revised in the price or in the quantity even decrease allocation ratio by 12%. Therefore, Jenkinson and Jones results suggest that bookrunners are more concerned on placing the issued shares to long-term investors – thus favouring regular and large size bids – than on gathering information about the issue during the bookbuilding period, even though, as specified by authors (Jenkinson and Jones, 2004, p.2337), “this does not preclude information production happening before the bookbuilding phase and being rewarded with the final allocation”.

Results	
Largest size quartile	+40%
Second largest size quartile	+20%
Limit bid	+15%
Currency bid	+6%
Early bid (first 25%)	-2%
Revised bid	-12%
High frequency (more than 6 issues)	+34%
Medium frequency (between 3 and 5 issues)	+5%
Home investor	-1%
Bid submitted to the bookrunner	+55%
Adj. R-squared	7.4%
Number of bids	5,510

Table 13: Factors affecting IPO shares allocation (source: own re-elaboration of empirical results from Jenkinson and Jones, 2004)

Aggarwal, Prabhala and Puri

Consistently with bookbuilding models of IPO underpricing, Aggarwal, Prabhala and Puri (2002) enhance the empirical study previously performed by Cornelli and Goldreich (2001), by developing a clearer relation between institutional allocation of IPO shares and level of initial returns. Analysing 174 U.S IPOs undertaken between 1997 and 1998 and managed by 9 different investment banks, they documented a positive relation between degree of institutional allocation and level of underpricing.

As shown in the Table 14 summarizing the mean results both for the analysed sample and for the entire population of IPOs that took place in the considered period, the sample used consists of larger issues at higher prices compared to the population. This is because Aggarwal, Prabhala and Puri find that institutional allocations tend to concentrate more in better performing IPOs, whose pre-market demand and offer price are particularly high. As a consequence, as predicted by Benveniste and Spindt (1989), stronger pre-market IPOs result in more underpriced shares allocated to institutional investors (as displayed in Table 14, initial return for the sample having an institutional allocation rate of 72.77% is equal to 19.25%, while it is much lower for the entire population, 14.27%).

IPOs sample	174 U.S. IPOs (managed by 9 underwriters)		
Analysed period	May 1997 - June 1998		
Underpricing calculation	RIR		
Main results		sample (N=174)	population (N=617)
	Proceeds (\$ ml)	\$132.2	\$75.55
	Shares Offered	7.47	6.07
	Offer Price	\$15.09	\$12.37
	Initial Return	19.25%	14.27%
	Institutional Allocation	72.77%	-

Table 14: Descriptive statistic of Aggarwal, Prabhala and Puri analysis (source: own re-elaboration of Aggarwal, Prabhala and Puri data, 2002)

After having tested the fact that institutional investors, thanks to greater allocation of underpriced shares in IPOs with strong premarket demand, indeed obtain superior profits than retail investors do, Aggarwal, Prabhala and Puri demonstrate that this effect persists even when controlling for premarket demand. The related regression conducted on the sample shows for instance that an increase in the institutional allocation percentage from 64.95% to 81.44% increases expected IPO underpricing by 5.12%. This implies that institutional allocation and underpricing relation is beyond that predicted by premarket demand: in other words, institutional investors seem to have private information about first day returns not fully captured by premarket demand or publicly owned information. Such private information could reflect institutional investors superior information that allows them to participate only in better performing IPOs, or could alternatively be held by investment banks that use it in order to favour institutions. Whatever the explanation is, Aggarwal, Prabhala and Puri proved that institutional allocations in underpriced IPOs is in excess of that required by bookbuilding process.

Ljungqvist and Wilhelm

In their paper entitled “*IPO allocations: discriminatory or discretionary?*” Ljungqvist and Wilhelm (2002) try to empirically shed light on the question whether discretionary allocations of shares by banks are beneficial to IPO participants or whether instead they just serve bankers’ interests at the expense of the other parties. To do so, they analyse a large sample of 1,689 equity offerings conducted worldwide between 1990 and 2000, structured as shown in Table 15. The dataset consists of three parts: IPOs conducted in 15 States of the European Union (EU15), IPOs that took place in Europe but in States not belonging to the EU and IPOs in the rest of the world.

IPOs sample	1,689 IPOs of 37 countries all over the world		
Analysed period	1990 - 2000		
Underpricing calculation	RIR		
Dataset	country	N	mean institutional allocation
	U.K.	843	92.9%
	France	244	76.1%
	Germany	144	57.7%
	Other countries	273	66.4%
	<i>EU15</i>	<i>1,504</i>	<i>82.3%</i>
	<i>Non EU15</i>	<i>34</i>	<i>73%</i>
	U.S.	32	66.3%
	<i>Rest of the world</i>	<i>119</i>	<i>62.8%</i>

Table 15: Descriptive statistic of Ljungqvist and Wilhelm analysis (source: own re-elaboration from Ljungqvist and Wilhelm data, 2002)

However, authors focus their analysis mainly on four countries characterized by particular shares allocation regulations: the U.S. and Germany, where bookbuilding is the common practice and where primary markets impose few rules on shares allocation; France and United Kingdom, where issuers can select among a range of mechanisms and investment banks are usually subject to quite sever rules undermining their discretion exercise. For each of these countries, mean gross proceeds, underpricing and institutional allocation ratio of IPOs for which allocation data are available are displayed in Table 16.

France	Number of Observations	237
	Gross Proceeds (\$ ml)	146.5
	Underpricing (%)	17.4
	Institutional Allocations (%)	76.0
Germany	Number of Observations	141
	Gross Proceeds (\$ ml)	241.5
	Underpricing (%)	49.4
	Institutional Allocations (%)	58.4
U.K.	Number of Observations	231
	Gross Proceeds (\$ ml)	261.6
	Underpricing (%)	11.9
	Institutional Allocations (%)	86.3
The U.S.	Number of Observations	32
	Gross Proceeds (\$ ml)	172.3
	Underpricing (%)	8.9
	Institutional Allocations (%)	66.3

Table 16: IPOs gross proceeds, underpricing and institutional allocations by selected countries (source: own re-elaboration from Ljungqvist and Wilhelm empirical results, 2002)

Ljungqvist and Wilhelm generalize three important implications. First, constraints in allocation discretion result in smaller revisions relative to indicative price range: authors demonstrate that constraints on the allocation of shares reduce average revisions by 21%, while, controlling for

regularity constraints, they have positive and significant effect on price revisions (+4.7%). On one hand, this proves how allocation of shares to institutional investors creates a positive effect on price revisions, since they generally own more valuable information about the issue than retail investors. On the other, it makes clear that reducing bankers' discretion on institutional allocation limit price revisions and therefore diminishes information production. Second, institutional investors are rewarded with above normal large allocations in order to compensate them for revealing valuable information: Ljungqvist and Wilhelm find indeed that IPO proceeds result negatively related to institutional allocations, proving that large size IPOs provide more "currency" to compensate informed investors and therefore reduces the net proceeds issuers expect. Third, constraints on banker discretion, that translates into smaller institutional allocations, rise the indirect costs of going public: surprisingly, large institutional allocations reduce IPOs initial return by 3.9%. Furthermore, they also find that employing underwriters with higher market experience allows issuers to lower underpricing, confirming again the certification effect provided by large and well reputed investment banks.

Though Ljungqvist and Wilhelm results show that investment banks' discretion on allocation of shares is on average beneficial to issuing companies since it allows to set more informative prices and to minimize the loss in going public, they also conclude that in some cases investment banks discretion could also be used for favouring repeated investors and satisfying banks' own interests.

3.5 - UNDERPRICING RELATED TO PRICE SETTING MECHANISM

"The solution to the underpricing puzzle has to lie in focusing on the setting of the offer price, where the normal interplay of supply and demand is suppressed by the underwriter": following Ritter and Welch (2002, p.11) statement, the last empirical evidence this elaboration wants to describe deals with the link between IPO initial returns and the price setting mechanism. Although bookbuilding represents the most broadly used approach to conduct an initial public offering, many researchers have questioned its ability to effectively reflect true issuing firm value in the IPO price, thus increasing underpricing level above the necessary level. On the contrary, auctions have been sometimes claimed as providing for more information production in the setting of the offering price, although being rarely chosen as issuing mechanism because of the key role investment banks have in accessing important institutional investors, when adopting the bookbuilding approach. This section will report some of the main empirical studies about the topic: Derrien and Womack (2003), Kaneko and Pettway (2003) and Lowry, Officer

and Schwert (2010), all registering a lower level of underpricing when dealing with IPO auctions.

Derrien and Womack

Trying to understand which of the available pricing mechanisms reveals to be the most effective in pricing an IPO offering, Derrien and Womack (2003) decided to analyse the French IPO stock market: France, indeed, offers a unique contribution to the topic, since all the three issuing mechanisms (fixed-price, auctions and bookbuilding) are generally used there. In particular, the French OPF corresponds to the fixed-price offerings, where the offer price, resulting from the negotiation between the issuing firm and the underwriter, is set approximately one week before the first trading day; the day before the IPO, potential investors place the orders specifying the exact number of share they are willing to buy at the fixed offering price; shares are then allocated by the market authority on a pro-rata basis. In the French OPM instead, equivalent to uniform price auctions, the underwriter and the issuer set a minimum acceptable offering price one week before the IPO date; the day before the effective trading, potential investors submit price/quantity bids, which are then collected and computed by the market authority; the issuer and its investment bank then negotiate with the market authority a maximum price: all bids greater than the maximum price are eliminated, so to avoid unrealistic bids and to guarantee that submitted investors' bids reveal their true valuation about the IPO firm; shares are finally allocated on a pro rata basis. French PG, alternatively known as bookbuilding, provides instead for the usual building of the book. Derrien and Womack analyse 264 French IPOs conducted between 1992 and 1998²⁴; auctions and bookbuilding samples are quite consistent (99 and 135 observations) while fixed-price offerings are just 24, due to the falling use of that mechanism during the last analysed years. Main empirical evidences are summarised in Table 17: dependent variables are the first-day return and squared variation of return, the latter representing the squared difference between the predicted and the observed underpricing; the independent variables are instead the market return, an index incorporating stock market conditions until 3 months before the date of pricing, and the market volatility, defined as the standard deviation of the returns of the market stock index; both are then multiplied by the procedure dummies (OPF, OPM and PG). One key finding is that market return has a significantly larger impact on underpricing in bookbuilt and fixed-priced IPOs (3.277% and 1.873%, respectively) than in auctions (1.062%). The significantly positive coefficient of the

²⁴ The effective sample is slightly smaller because data about some IPOs were not available.

market volatility in the case of bookbuilding (19.315%) shows instead that bookbuilding procedure is much more sensitive to market volatility than IPOs conducted through auctions. Also looking at the squared variation of return, the variability of underpricing results more accentuated for bookbuilding offerings (6.640%) than for auctions (0.402%) and fixed-price offerings (1.640%).

IPOs sample	264 French equity offerings		
Analysed period	1992 - 1998		
Underpricing calculation	RIR		
Dataset	24 fixed price offerings (OPF)		
	99 uniform price auctions (OPM)		
	135 bookbuilding offerings (PG)		
Main results	Variables	First-day return	Squared variation of return
	market return*OPF	1.873	0.183
	market return*OPM	1.062	0.184
	market return*PG	3.277	1.059
	market volatility*OPF	8.197	1.640
	market volatility*OPM	2.677	0.402
	market volatility*PG	19.315	6.640

Table 17: Market return and volatility of French OPF, OPM and PG (source: own re-elaboration from Derrien and Womack empirical findings, 2003)

Therefore, Derrien and Womack findings show that auction pricing mechanism is associated with less underpricing and lower variance of underpricing than other mechanisms, mainly because of the auctions' ability to incorporate more recent information about the recent market conditions inside the IPO price. French auction market driven procedure is indeed subject to fewer frictions and reflects all investors' valuations more completely in the offer price, thus reducing underpricing, while bookbuilding offerings, being led by underwriters, also reflect investment banks' interests in satisfying repeated investors objectives.

Kaneko and Pettway

Kaneko and Pettway (2003) compare instead price-competitive auctions to bookbuilt IPOs focusing on the Japanese stock market. This choice was dictated by the fact that, before 1997, only price discriminatory auctions were used in Japan to price IPOs, while from September 1997 bookbuilding practices led by underwriters were also allowed. In particular, Japanese auctions provide for a competitive price process under which bids are accepted from the highest bidders in the rank order until the number of auctioned shares are all sold; investors affiliated with the issuing firm cannot participate to the auction nor receive the allocated shares from the

underwriters; furthermore the number of shares that could be subscribed by a single investor is very limited, so that this leads to a wide distribution of offered shares across many investors. Under the bookbuilding mechanism instead, as for the other countries, the underwriter prices the offer and allocates shares discretionally among investors. Japanese stock market offers therefore a particularly interesting situation in terms of IPOs price setting mechanisms.

The analysed sample consists of 950 Japanese IPOs conducted between 1993 and 2001: of course, the number of IPOs using auctions is greater than those using bookbuilding, simply because bookbuilding was allowed only from 1997. All the analysed auction (481) took place on the OTC market – that is the largest stock market for IPOs in Japan – while 357 bookbuilding IPOs were conducted on the OTC, 36 bookbuilt IPOs on the Mothers stock exchange (the Japanese stock market dedicated to start-up firms) and 76 bookbuilt IPOs on the NASDAQ-Japan, for a total of 469 bookbuilt IPOs. Dataset’s offering indicators in terms of offer price, gross proceeds, initial return and wealth loss by issuer are detailed in Table 18.

IPOs sample	950 Japanese IPOs		
Analysed period	1993 - 2001		
Underpricing calculation	RIR		
Dataset	Measures	OTC Auctions	All book-building IPOs
	number of IPOs	481	469
	average offer price (yen)	29,756	651,247
	average gross proceeds (ml yen)	3546	3643
	average initial return (%)	11.4%	48.0%
	% of positive initial returns	93.14%	77.4%
	average wealth loss (ml yen)	257	1253

Table 18: Descriptive statistic of Kaneko and Pettway analysis (source: own re-elaboration from Kaneko and Pettway data, 2003)

The most significant results refer to underpricing level and wealth loss suffered by single issuer, obtained after controlling for ex-ante uncertainty and other issue and firm specific variables. As can be already noted from Table 18, the average initial return of auction-price IPOs is about four times lower than that of bookbuilt IPOs (11.4% versus 48%, respectively). The wealth lost by issuing firm in millions of yen, calculated as the gross proceeds multiplied by the percentage initial return, is even much higher for underwriter-priced IPOs than for auctions (1253 million of yen for bookbuilding compared to just 257 million of yen for auctions). These first evidences show that, under bookbuilding approach, investors receive higher returns while issuing firms leave much more money on the table. Table 19, which reports annual data, further confirms these findings: OTC auctions present average initial returns of 11.4%, while OTC bookbuilt IPOs of 47.6%; bookbuilt issues made on the Mothers have average initial returns of 37.4%,

while those listed on NASDAQ-Japan of 54.87%. Comprehensively, bookbuilding IPOs have significantly higher underpricing levels in each year than those of auctions, dramatically higher in 1999. However, Kaneko and Pettway also precise that their findings are stressed by the fact that Japanese underwriters, differently from American underwriters for instance, never set the offer price above the upper limit of the initial price range established prior to the sale, resulting in strongly underpriced Japanese bookbuilt IPOs.

Year	IPO pricing system	OTC		Mothers		NASDAQ-Japan	
		N	IR	N	IR	N	IR
1993	auction	54	11.9%				
1994	auction	106	10.84%				
1995	auction	138	12.67%				
1996	auction	109	15.41%				
1997	auction	74	3.58%				
	book-building	28	9.87%				
1998	book-building	62	23.78%				
1999	book-building	73	134.4%	2	227.64%		
2000	book-building	97	21.73%	27	7.59%	33	27.04%
2001	book-building	97	34.47%	7	98.0%	43	76.23%

Table 19: Auctions and bookbuilt Japanese IPOs underpricing in the period 1993-2001 (source: own re-elaboration from Kaneko and Pettway empirical results, 2003)

Lowry, Officer and Schwert

In their paper entitled “*The variability of IPO initial return*”, Lowry, Officer and Schwert (2010) introduce the issue of IPO price setting mechanism only as a conclusion of their previous work. Observing IPOs underpricing great variability both in time and across different types of firms, they indeed note that not only IPO prices result usually underpriced, but also that the majority of the listed companies presents underpricing very far from the average, attesting heavy pricing errors by underwriting firms. In this view, they test a small sample of U.S. auctions and conclude that such a mechanism could lead to a more accurate IPO price.

The starting point of their analysis consists in a large sample of 11,734 U.S. IPOs conducted during a wide period of time: 1981-2005. Computing the effects of various market characteristics on monthly averages and standard deviation of IPOs initial returns –using the RIR formula on the closing price of the 21st day of trading – authors decide to segregate results relating to the Internet bubble. As can be noted from Table 20, also when Internet IPO bubble period is excluded from the sample, technology and firm’s age variables seem to have a strong effect on IPO average and standard deviation initial return. Similar to the general empirical

evidence about IPO underpricing and Internet-related firms exposed in the previous section, also Lowry, Officer and Schwert find that months in which more listing firms belong to the high-technology industries (including biotech, computer equipment, electronics, communications, and general technology) and months in which listing firms are younger, exhibit a higher average and a higher variability of initial returns: higher percentage of technology firms increases average underpricing by 26% and underpricing standard deviation by 27%, while a higher percentage of older firms decreases average underpricing by 12% and reduces underpricing standard deviation by even 29%.

IPOs sample	11,734 IPOs			
Analysed period	1981 - 2005			
Underpricing calculation	RIR on the 21st trading day closing price			
Main Results	<u>Including bubble</u>		<u>Excluding bubble</u>	
	<i>Average Initial Return</i>	<i>Std. Dev. of Initial Return</i>	<i>Average Initial Return</i>	<i>Std. Dev. of Initial Return</i>
underwriter rank	0.14	0.19	-0.04	-0.08
number of shares	0.22	0.26	0.15	0.16
percentage technology	0.48	0.52	0.26	0.27
percentage venture capital	0.30	0.32	0.15	0.11
NYSE	-0.12	-0.07	-0.04	0.01
NASDAQ	0.17	0.13	0.08	0.04
firm's age	-0.29	-0.34	-0.12	-0.29
price update	0.50	0.61	0.08	0.19

Table 20: Descriptive statistic of Lowry, Officer and Schwert dataset (source: own re-elaboration from some Lowry, Officer and Schwert data, 2010)

The empirical evidence found by Lowry, Officer and Schwert suggests that the conventional pricing mechanism of bookbuilding is not able to incorporate all the information learned during the bookbuilding period in the final offer price, thus resulting in strongly and largely altering IPOs underpricing; differently, underwriters seem not to be able, in general, to fully capture the clearing market price that will equate supply and demand for a given issue. Authors therefore decide to test whether IPO price set under the auction mechanism – which provides for that information of all market participants will be used to set the offer price – effectively entails lower level of initial returns. Hence, they compare a small sample of 16 U.S. auctions undertaken between 1999 and 2005, all managed by W.R. Hambrecht & Co and listed on the NASDAQ, with a matched sample of 32 bookbuilt comparable IPOs in terms of size and total assets (two comparable IPOs per auction). As displayed in Table 21, companies listed through the auction mechanism are quite small, except for the giant Google, which in 2004 collected

more than \$1,6 billion as IPO proceeds²⁵. Results highlight very different initial returns for auctions and bookbuilt IPOs: mean first-day initial return for the auctions sample is just 1.5%, really modest considering that the majority of auctions were performed during the Internet bubble period, when underpricing levels were particularly elevated; mean bookbuilt IPOs first-day initial return is, on the contrary, much more high, equal to 22%. Standard deviation of first-day initial return is also lower for the auction sample than for the bookbuilding one (10.1% compared to 47.6%, respectively). The same patterns are evident when considering the first-month initial returns. Despite the moderate size of the analysed sample, Lowry, Officer and Schwert findings suggest that auctions of IPO stocks result in considerably more accurate pricing than the usual bookbuilding comparable offerings. Authors therefore conclude that many issuing firms are willing to accept a less accurate offer price and a higher level of underpricing as a way to compensate underwriters for post-IPO services such as market making or analyst coverage. However, some issues, such as Google, are likely to find auction mechanism as more attractive than bookbuilding, given their ability to obtain substantial analyst coverage and marketing, regardless of the issuing mechanism chosen.

<i>Auction Companies</i>	<i>Proceeds (\$ ml)</i>	<i>First-day Initial Return</i>	<i>First-month Initial Return</i>
Ravenswood Winery	10.5	3.6%	0.6%
Salon.com	26.2	-4.8%	8.3%
Nogatech Inc	72.0	-21.6%	-42.4%
Peet's Coffee \$ Tea	26.4	17.2%	6.3%
Briazz Inc	16.0	0.4%	-37.6%
Overstock.com Inc	39.0	0.2%	3.8%
RedEnvelope Inc	30.8	3.9%	-4.0%
Genitope Corp	33.3	11.1%	36.1%
New River Pharmaceuticals	33.6	-6.3%	-5.3%
Google Inc	1,666.4	18.0%	34.1%
Bofl Holding Inc	35.1	0.0%	-4.3%
Morningstar Inc	140.8	8.4%	18.6%
CryoCor Inc	40.8	8.4%	18.6%
Avalon Pharmaceuticals Inc	28.9	-9.6%	-46.4%
Dover Saddlery Inc	27.5	2.5%	0.0%
Mean		1.5%	-3.7%
Mean of the matched sample		22.0%	37.0%
Standard deviation		10.1%	25.0%
Standard deviation of the matched sample		47.6%	50.7%

Table 21: U.S. auctions first-day initial return and first-month initial return compared to bookbuilt IPOs mean and standard deviation (source: own re-elaboration from Lowry, Officer and Schwert empirical findings, 2010)

²⁵ The reported results already exclude Andover.net auction and the two related matched IPOs, since the company registered a first-day initial return of 252%, which created substantial effects on the sample statistics given the small size of analysed sample.

CHAPTER 4 – THE SPOTIFY DPO CASE

In the previous chapters it has been first described the process of going public with the respective benefits and costs, it has then been argued the various numerous theories focusing on the main indirect cost of listing, shares underpricing, and it has finally been presented the most recent empirical evidences around the issue, necessary to contextualize the following section. This last Fourth Chapter will therefore face the underpricing phenomenon from an unexplored point of view: that of companies choosing to list their shares using an alternative and unorthodox way, the direct public offering. As it has already been anticipated, until 2018 this particular mechanism was only undertaken by spin-off or bankruptcy firms mainly in OTC markets; on April 3, 2018 instead, Spotify Technology, the Swedish global music streaming service, decided to give the possibility to its existing shareholders to sell their shares by listing them on the NYSE through a DPO. The case has been widely debated by the majority of the most important organizations and institutions dealing with stock markets. The element of interest was mainly represented by the possibility that Spotify' DPO, if welcomed by the NYSE – which indeed applied to change its own rules so to allow the company to list through this innovative way – would have fostered other well established technology companies to do the same, hence diminishing investment banks relevance and gains from the IPO process. The focus of this chapter is however completely different and much narrower: it aims at assessing the company's fundamental value, at understanding in which extent this was taken into account by advisors and institutions involved as well in the DPO process, and finally at debating if also the case of Spotify could be deemed underpriced and which could eventually be the advantages of undertaking a direct listing in terms of initial first-day return.

Therefore, the first section of this chapter will present the most relevant aspect of the company's business, the company's financial results over time and how they translate with respect to market positioning. The second part will instead deal with the peculiar listing process followed by Spotify, with a particular focus on the mechanism by which reference and opening price have been determined. The third section will instead present a research on a small sample of Internet-related IPOs conducted between 2016 and 2018, trying to highlight the similarities and the differences between the average characteristics of the sample and those of Spotify's, always in light of shares underpricing. Another section will then perform Spotify's fundamental valuation using DCF methodology, then supported by Multiples analysis. The last part will finally debate some of the most critical aspects of Spotify's listing and will report which suggestions could be drawn from the case.

4.1 – COMPANY’S HISTORICAL OVERVIEW

Spotify Technology SA is a Sweden company, now incorporated in Luxemburg, which offers the largest global music streaming subscription service. Its primary business is based on an audio streaming platform that provides protected music from record labels and media companies. Founded and developed in 2006 by Daniel Ek and Martin Lorentzon, the first Spotify application was launched in 2008, a period in which music industry revenues were in decline due to piracy and digital distribution growth. Spotify’s mission, as reported on the company’s website and in the Registration Statement (2018, p.1), is to “unlock the potential of human creativity by giving a million creative artists the opportunity to live off their art and billions of fans the opportunity to enjoy and be inspired by these creators”, so “to provide a better way for both artists and consumers to benefit from the digital transformation of the music industry”.

Spotify does not produce original contents, but just showcases contents whose rights are obtained through licence agreements with important media groups as Universal Music Group, Sony Music Entertainment and Warner Music Group. Hence, the company primarily relies on two sources of revenues: advertising and subscription fees. Spotify’s customers can in fact choose between two different services: a “premium” service which provides users with an unlimited online and offline high-quality music streaming experience, free of commercial; and an “ad-supported” service, which is characterized by no subscription fees and provides users with limited on-demand online access to over 35 million tracks available on the platform. In both cases, the platform also gives users the possibility to create and share music playlists, to text and recommends tracks to other users so to improve the social component associated with the streaming. As can be seen from Figure 3, the company operates worldwide, offering its services in most of Europe, the Americas, Australia, some regions of Africa and Asia, and on the most modern devices as Windows, macOS and Linus computers, iOS and Androids smartphone and tablets. At the end of 2017 the company counted 157 million of monthly active users and 71 million of premium subscribers worldwide.

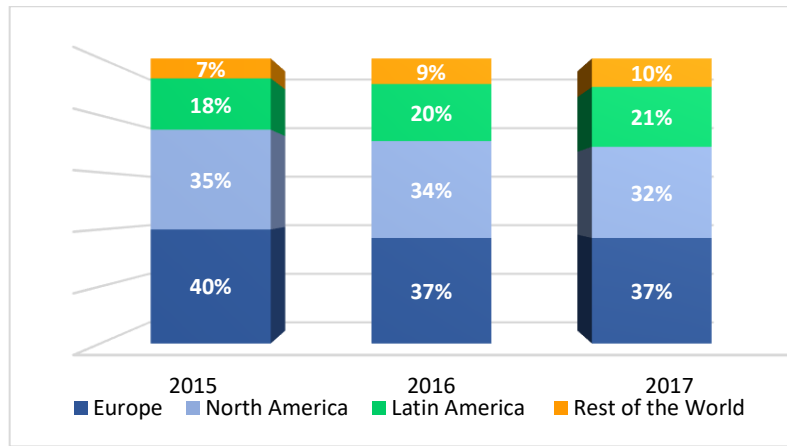


Figure 3: Spotify's monthly active users by region in the period 2015-2017 (source: own elaboration based on Spotify's Registration Statement, March 2018)

Spotify financial results

As Spotify's business model relies on showcasing licensed contents to generate revenue, its past financial results appear highly affected by typical problems of such a business. As can be assessed by looking at Figure 4 indeed, while company's revenues grew rapidly year on year, net losses steadily increased as well.

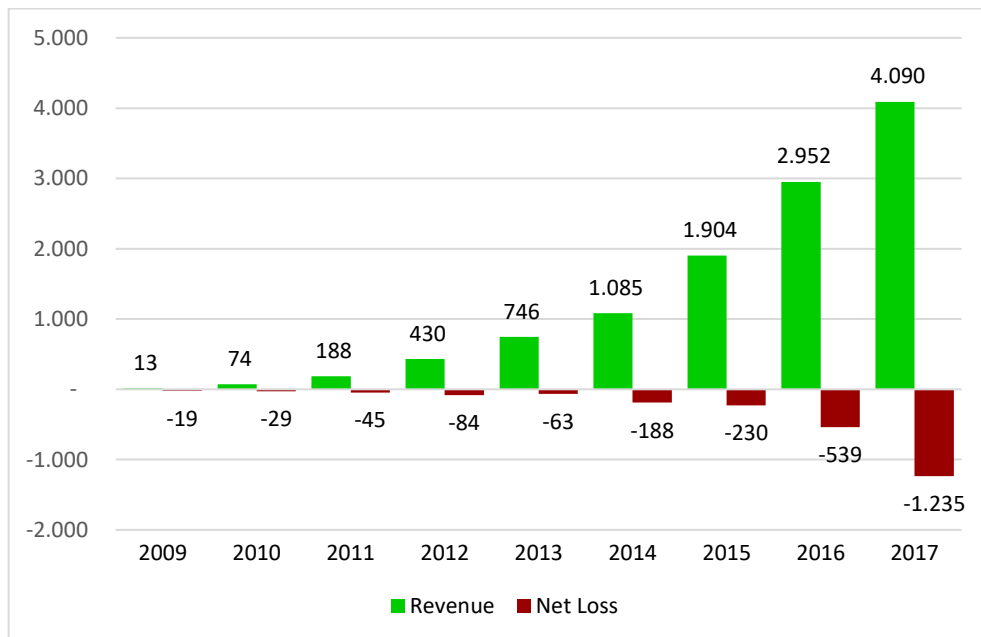


Figure 4: Spotify's revenue and net losses on the period 2009-2017. Data in millions of € (source: own elaboration based on Spotify's Registration Statement, March 2018)

Disregarding start-up phase years, over the period 2009-2017 the company records a CAGR in revenue equal to 105.6%: 2017 revenue, amounting to €4,090 million, are 300 times higher than 2009 revenue (€13 million) and almost four times 2014 revenue (€1,085 million). In the

last five years (2013-2017) revenue still present a relevant CAGR of 53%, attenuating during the last three years (2015-2017) with a CAGR of 45%: year on year revenue growth for 2015, 2016 and 2017 are respectively 75.5%, 55.0% and 38.5%. As shown by Table 22, in the last three years the largest part of revenues stems from subscription fees paid by premium users (almost 90% of total revenues in all the considered years is given by premium segment); year on year increase in premium revenues of 52% and 38% are primarily due to an increase in the number of premium subscribers, probably partly driven by the introduction of two more affordable premium plans built ad hoc to target broaden populations of users, students and families. On the other hand, ad-supported revenues averagely count for the 10% of total revenue, though exhibiting positive rate of growth: revenues attributable to the music-free service increase by 51% from 2015 to 2016, and by 41% from 2016 to 2017, confirming advertising as a relevant source of inflow.

<i>Data in millions of €</i>	2015	2016	2017	% change 2015 to 2016	% change 2016 to 2017
Total Revenue	1,904	2,952	4,090	52%	39%
Premium	1,744	2,657	3,674	52%	38%
<i>% on total revenue</i>	<i>91.6%</i>	<i>90.0%</i>	<i>89.8%</i>		
Ad-supported	196	295	416	51%	41%
<i>% on total revenue</i>	<i>10.3%</i>	<i>10.0%</i>	<i>10.2%</i>		

Table 22: Spotify's revenue in the three years before the DPO by type of users (source: own elaboration based on Spotify's Registration Statement, March 2018)

Although premium subscribers generate the largest part of revenues, they still represent the minority of Spotify's users. Servicing of "monthly active users" (MAUs) notion, defined as the number of people which effectively uses the platform for a certain fraction of time in a period of 30 days, Figure 5 shows and compares the evolution of ad-supported MAUs with premium subscribers from 2015 to 2017, by quarter. As can be immediately noted, despite growing at relevant path, premium users always remain far below the number of free-users: at the end of 2015 they represent 31% of total MAUs (91 millions), 39% at the end of 2016 (123 million MAUs) and 45% at the end of 2017 (157 million MAUs). It is worth to highlight however that, as declared by Spotify in the Registration Statement, the increase in the premium subscribers' component is mainly due to the conversion of ad-supported users, through mechanisms such as product links and marketing across the leading social media platforms. Therefore, reporting declarations of the company, the key factor to ensure the growth of the business relies first in the capability of acquiring new users exploiting all the possible marketing techniques and synergies with the main social media, and second, in the ability of the company to convert these added users into subscription-fees payers. On average, until 2017, Spotify was able to always

rise the number of its monthly active users: +35% of users from the last quarter of 2015 to the last quarter of 2016 and +28% from the last quarter of 2016 to the last quarter of 2017.

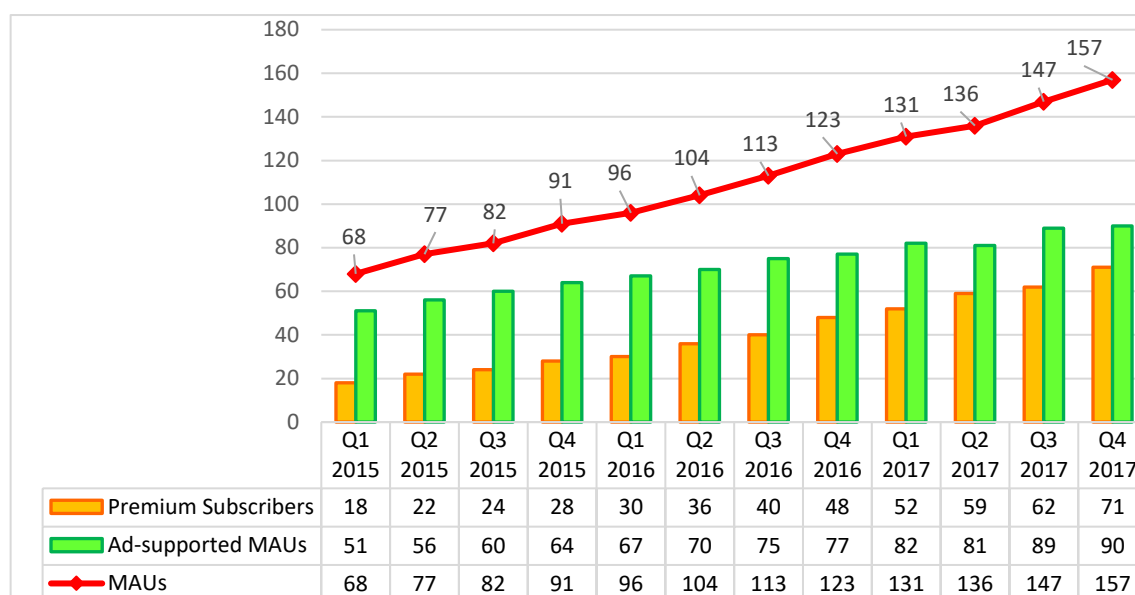


Figure 5: Spotify's MAUs divided into premium subscribers and ad-supported MAUs in the period 2015-2017, by quarter. Data in millions of € (source: own elaboration based on Spotify's Registration Statement, March 2018)

Analysing Spotify profit and loss statement in the last three years before the direct public offering (Table 23), it can be noted that a great part of revenue is absorbed by the cost of goods sold, which represents the 88%, 86%, and 79% of revenue in 2015, 2016 and 2017, respectively. COGS primarily consists of royalties and distribution costs related to content streaming; it also includes credit card and payment processing fees for subscription revenue, customer service, some employee compensation and benefits, cloud computing, facility and equipment costs.

Data in millions of €	Consolidated P&L Statement		
	2015	2016	2017
Revenue	1,940	2,952	4,090
COGS	<u>1,714</u>	<u>2,551</u>	<u>3,241</u>
Gross Profit	226	401	849
Research and Development	136	207	396
Sales and Marketing	219	368	567
General and Administrative	<u>106</u>	<u>175</u>	<u>264</u>
Income (Loss) from Operations	(235)	(349)	(378)
Net Finance Income (Costs)	<u>10</u>	<u>(186)</u>	<u>(855)</u>
Income (Loss) before Taxes	(225)	(535)	(1,233)
Income Tax Expense	<u>5</u>	<u>4</u>	<u>2</u>
Net Income (Loss)	<u>(230)</u>	<u>(539)</u>	<u>(1,235)</u>

Table 23: Spotify's reclassified Profit and Loss statement for the years 2015-2017 (source: own elaboration based on Spotify's Registration Statement, March 2018)²⁶

²⁶ Consolidated Balance Sheet and Profit and Loss Statements are reported in Appendix A.

However, the bulk of the variable costs sustained by the company is given by royalties paid to record labels, music publishers, and other rights holders for the right to stream music to the company’s users. As shown by Figure 6 indeed, from 2012 to 2015, royalties and distribution costs nearly constituted the entirety of the cost of revenue, averaging around 97% of the total COGS; since 2016 then, royalties have started to stabilize around 78% of the cost of revenue. This initial improvement in the amount of royalties becomes evident also considering their absolute growth: while they substantially grew in 2013 and 2015 (+60% and +85%), they only increased by 21% and 27% in the last two years, also thanks to the new terms of the licensing agreements stipulated with Universal Music Group, Sony Music Entertainment, Warner Music Group, and with Merlin, among others. Despite this, Spotify’s royalties payment model is still structured in a way through which these costs result directly linked to revenue: monthly royalties are in fact calculated on the basis of a wide range of variables, among which the amount of revenue generated, the type of content streamed and the country in which such a content is streamed. In addition, some licencing agreements establish some targets in terms of users to be reached, some advanced payments to be made or some minimum amount to be guaranteed²⁷.

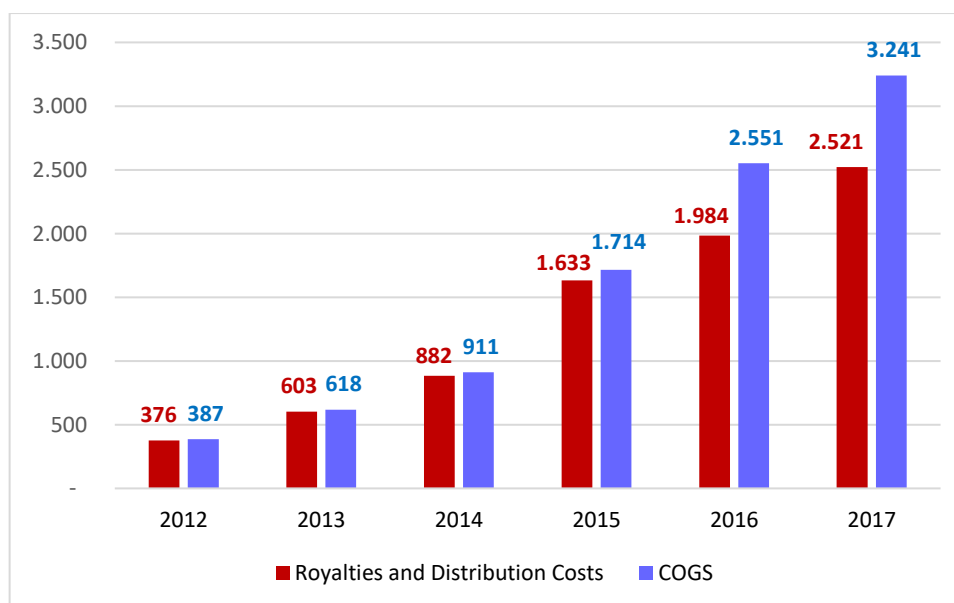


Figure 6: Royalties paid and COGS of Spotify in the period 2012-2017. Data in millions of € (source: own elaboration from Statista data available at <https://www.statista.com/statistics/487332/spotify-royalty-payment-costs/> and company’s Registration Statement, March 2018)

Despite royalties still absorb Spotify’s largest part of revenue, in the last years the company was able to mitigate their effects on the gross margin, as shown by Figure 7: the gross profit

²⁷ Spotify even has license agreements that include so-called “most favoured nations” provisions, that require that the terms of such agreements are the most favourable terms provided to any music licensor, which could cause royalty payments under those agreements to escalate substantially.

ratio indeed, increased from less than the 10% of revenue in 2015 to more than the 20% in 2017. Expenses related to research and development – mainly incurred for the development of new or improved products related to platform and mobile app - and sales and marketing – which comprise events and trade shows, public relations, branding, advertising, consulting in order to acquire new customers – then show discrete increases year on year (averaging 8% and 12% in the three considered years, respectively), which could be deemed to be organic to the expansion of the company and to the consequent increased competition within the business. Operating results, however, always turn into operating losses, that are further worsened by financial interest expenses (approaching the billion of Euros in 2017, due to a conspicuous founding started the year before). Since its foundation, Spotify has never become profitable; instead, the company continues to register net losses: 2017 net loss, amounting to €1,235 million, is more than four times higher the 2015 net loss (€230 million) and 129% higher than 2016 net loss (€539 million).

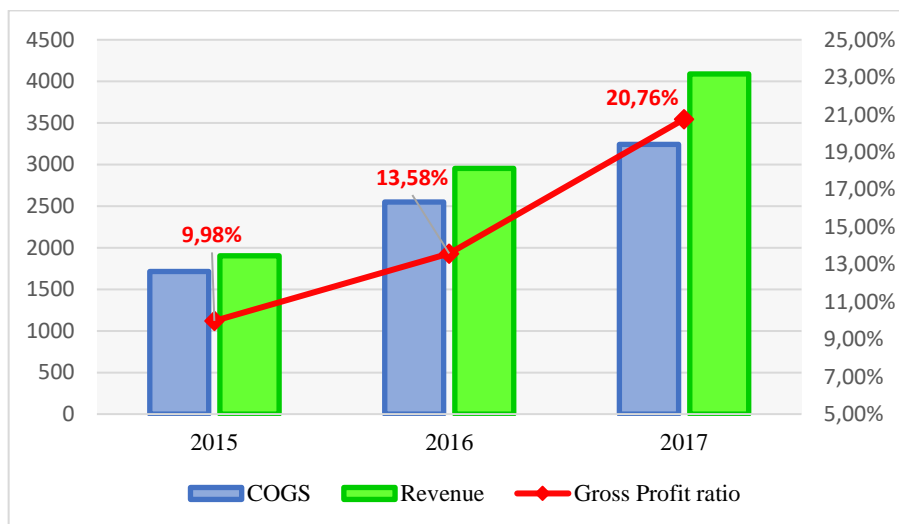


Figure 7: Spotify’s gross margin ratio in the period 2015-2017 (source: own elaboration based on the company’s Registration Statement, March 2018)

Table 24 reports Spotify’s consolidated balance sheet for the last three years before the public offering of the company. Total assets of the company quite doubled from 2015 to 2016, passing from €1,051 million to €2,100 million, and rapidly grew also from 2016 to 2017, reaching €3,107 million in the last considered year.

<i>Data in millions of €</i>				Consolidated Balance Sheet Statement			
ASSETS	2015	2016	2017	LIABILITIES AND EQUITY	2015	2016	2017
Total Current Assets	871	1,909	1,898	Total Current Liabilities	798	1,220	1,860
Cash and Cash Equivalents	597	755	477	Trade and other Payables	119	201	341
Trade and other Receivables	244	300	360	Income Tax Payables	5	6	9
Income Tax Receivables	3	6	-	Provisions	15	57	59
Short-term Investments	-	830	1,032	Derivative Liabilities	82	134	354
Other Current Assets	27	18	29	Other Current Liabilities	577	822	1,097
Non-current Assets	180	191	1,209	Non-current Liabilities	24	1,120	1,009
Property and Equipment	81	85	73	Convertible Notes	-	1,160	944
Intangible Assets and Goodwill	73	80	162	Provisions	8	4	6
Long-term Investments	1	-	911	Deferred Tax Liabilities	-	-	3
Deferred Tax Assets	4	3	9	Other non-current Liabilities	16	10	56
Other non-current Assets	21	23	54	Shareholders' Equity (Deficit)	229	(240)	238
Total Assets	1,051	2,100	3,107	Total Liabilities and Equity	1,051	2,100	3,107

Table 24: Spotify's reclassified balance sheet in the period 2015-2017 (source: own elaboration based on the company's Registration Statement, March 2018)

Part of this increment is due to the expansion of company's intangible items, as can be expected from a firm operating in the music streaming business. Intangibles mainly include internal development costs, own patents, acquired technology and patents and goodwill. Internal development costs, net of accumulated amortization, amount to €5 million in 2015 and 2016, and increase to €12 million in 2017. Moreover, Spotify demonstrates to be particularly proactive also in the acquisition of other businesses and operations: in 2015, through an acquisition, the company increased goodwill by €7 million; during 2016, the company performed the acquisition of three separate businesses, after that €7 million were recorded to goodwill and €1 million as intangible assets; finally, during 2017, Spotify acquired further five separate businesses, paying partly in cash (€52 million) and partly in equity (€33 million): €71 million were recorded to goodwill and €17 million to acquired intangible assets. Consequently, as shown by Table 25, total intangibles and goodwill displayed in consolidated balance sheet of the company increased by more than 100%.

<i>Data in millions of €</i>	Internal development costs and patents	Acquired intangible assets	Goodwill	Total
December 31, 2015	5	12	65	82
December 31, 2016	5	2	73	80
December 31, 2017	12	15	135	162

Table 25: Spotify's intangible assets in the period 2015-2017 (source: own elaboration based on the company's Registration Statement, March 2018)

However, a large part of the last year increase of Spotify's assets can be explained by analysing company's funding sources. As can be assessed by looking at consolidated balance sheet, company's indebtedness towards credit institutions is null. From 2016 indeed Spotify chose to finance its operations through the issuance of €1,160 million of convertible notes. These notes bear an interest of 5% which increases by 100 basis points every six months and entail the possibility to convert them into Spotify's ordinary shares with a discount of 20% or more on the per share price, depending on the timing of conversion. Noteholders also had the possibility to take part of the so called "Tencent Transaction". Tencent is an operator of social network in China which owns a majority stake in Tencent Music Entertainment (TEM), an early mover which provides digital music services including streaming, online live broadcasts and karaoke services. In December 2017, Spotify and TEM agreed on performing a share exchange transaction, after that Spotify holds a minority stake in TEM and TEM holds indirectly, through an affiliated company, shares of Spotify. The aim of the transaction for both companies was mainly that of establishing long-term investments in the respective music streaming markets. Therefore, in December 2017, \$301 million of convertible notes were exchanged for 4,800,000 ordinary shares, then sold to the affiliated of Tencent. In the same period, \$110 million of convertible notes were converted in 1,754,960 Spotify's ordinary shares; at the beginning of 2018 then, \$628 million of convertible notes were further exchanged for 9,431,960 ordinary shares. In this sense, convertible notes have performed three functions: they first provided the company with available financial resources, they then partly served as mean of exchange to conclude long-term investments and they also broaden Spotify's shareholder base.

Since convertible notes are denominated in dollar, the company also tried to mitigate its exposure towards foreign currency creating a strong liquidity position so to use a sort of natural hedging: besides cash and cash equivalent, the company also invested in short-term securities such as government and agencies securities, corporate notes and collateralized reverse purchase agreements for a total of €830 million and €1,032 million in 2016 and 2017, respectively.

Spotify's market positioning

As the first application was launched, Spotify's service distribution rapidly grew and since many years the company holds the first position in terms of market share. At the end of June 2018 indeed, Spotify had a market share of 36%, substantially unvaried with respect to the same period of the previous year. Figure 8 reports market shares of all digital music companies providing content streaming: as can be seen, among Spotify's main competitors there are giants like Apple, Amazon and Google.

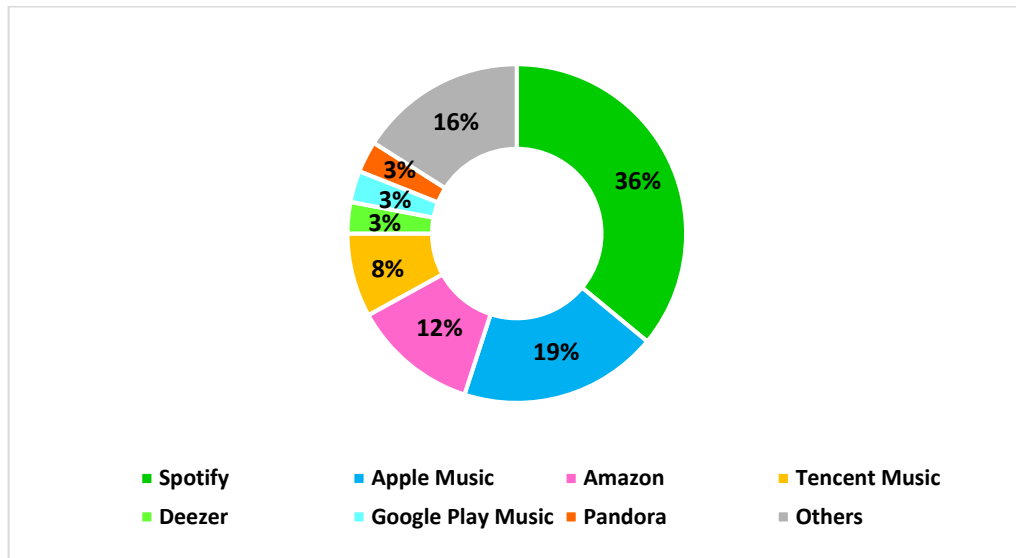


Figure 8: Market share of the main streaming music companies, as at June 2018 (source: MIDiA Research website available at <https://www.midiaresearch.com/research/>)

Differently from Spotify however, these firms have developed streaming music platforms as added services to their core business services and can therefore take advantage of it: Apple, for instance, does not need to create and to feed a market of streaming music users, because it already incorporates the service in the mobile devices it produces and distributes. Doing this, Apple was in fact able to improve its music streaming positioning compared to 2017, reaching 19% of market share in 2018. Despite this however, as shown in Figure 9, during the last two years before the direct listing, Spotify has been able to greatly distance its main competitor, Apple, in terms of worldwide premium subscribers. The third player of the market is Amazon, which, offering Amazon Music Unlimited and Amazon Prime Music, claims a market share of 12% at the end of June 2018. Besides them, another important music streaming provider is Tencent Music Entertainment in which, as seen in the paragraphs describing Spotify's financials, the company holds a minority stake: if the company, in the future, were be able to acquire the control of this business now belonging to the Chinese social network group, it would significantly expand its services worldwide (TME 2018 market share amounts to 8%). Moving forward, there are three streaming music providers which hold similar market shares (3%):

Deezer, Pandora and Google. Among them, Google is the one having the highest visibility, easy offering its music service through Google Play Store²⁸; the remaining two instead, like Spotify, are companies whose core business is that of the music streaming. Deezer, firstly launched in 2007, takes the form of a web application and offers on-demand streaming of more than 43 million tracks; Pandora is an American service offering customized on-line radio, now available only in the U.S., Australia and New Zealand. Finally, the remaining 16% of market share includes streaming music services as Joox, SoundCloud, TuneIn, Napster and Tidal, which, though not retaining significant stakes, must not be undervalued.

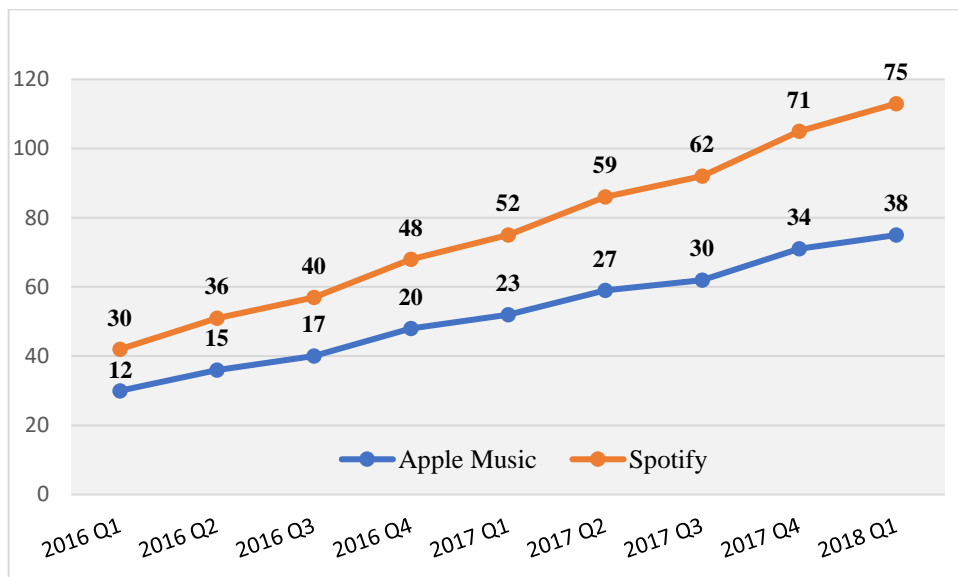


Figure 9: Millions of quarterly subscriber users for Spotify and Apple Music in the period 2016-2018 (source: Statista website available on <https://www.statista.com/statistics/604959/number-of-apple-music-subscribers/>)

Spotify's opportunities and risks

Analysing the company from an internal point of view, Spotify's strengths and weaknesses both rely on the extent and nature of its online services. As sustained in the firm's Registration Statement, Spotify has built its global success on the strength of its brand and value proposition: one of the pillars of the company is indeed that of providing users with a customized music experience, possible thanks to the continuous learning of a wide range of listening behaviours. This practice has allowed Spotify to engage even more users and to expand in various music streaming markets worldwide. Another key factor is that Spotify has become a key discovery tool for users to know new and emerging artists. However, as could appear obvious, Spotify expansion has only been possible thanks to the wide spread and easy accessibility of media

²⁸ It is worth to highlight that Google also owns YouTube, that, providing streaming contents, could be considered an indirect competitor of Spotify.

streaming services provided, that help to retain customers: if its on-demand music streaming services were not as easily or widely accessible, users would likely leave the company. All these elements enable the company to enlarge its users base and to, potentially, reduce fixed costs per account or per user by exploiting economies of scale.

However, the online nature of the offered contents forces the company to obtain rights, by stipulating licencing agreements with the major music labels and media groups, in order to distribute intellectual protected contents. By doing this, as seen in the paragraph dedicated to the company's financial statements, the most part of revenue is absorbed by the payment of royalties. In this context, Spotify has low bargaining power against content providers since, as streaming music market does not present particularly high barriers to entry and faces therefore increased concentration, content originators could always supply other streaming platforms able to pay higher fees or could even decide to develop their own streaming services. What is sure is that the company should renegotiate new contractual agreements based for instance on decreasing licensing fees over time, or should even think to vertically integrate: also exploiting the millions of data about users' music preferences and the possibility to have new artists growing within it, Spotify could become itself the originator of the contents it streams. Moreover, another weakness declared in the company's prospectus that characterizes all the firms of the sector, is the dependence on the Internet: in emerging countries for example, where the connectivity is slow and relatively costly, Spotify's attractiveness is lower.

One more issue is given by Spotify's dependence on other technology firms: normally, Spotify's users can access the service by downloading the music app through Apple App Store or Google Play which, being also among the principal competitors of the firm, could exercise some control on it. Competition and partial dependence on major technology firms is indeed the primary external threat for Spotify: these firms have in fact strong global market positions that allow them to potentially penetrate more streaming music markets thanks to their already consolidated services and products. Another aspect that could negatively affect Spotify's business is the probability to be sued for violation of intellectual property rights.

Despite these internal and external difficulties, music streaming market has sharply expanded in the last years, due partly to the general increase of mobile phone users worldwide, that is expected to even grow in the next future, and also to a net change in the way music is listened. As shown by Figure 10, that segments the digital music revenue in the U.S. from 2008 to 2018, subscription and streaming revenue have greatly overtaken single and album downloads, gaining more than \$7 billion in revenue during 2018. Besides intensifying its penetration on current markets – in the U.S. for instance Spotify already established a market share of 41% as

at 2016 and only in the United Kingdom the company had a market share of 59% in 2016 – Spotify’s future opportunities could also rely on developing countries: in Brazil, for example, the company already had a market share of 42% in 2016; moreover, the long-term equity investment made with Tencent Music Entertainment proves the firm’s commitment to expand soon in the Asian market. Furthermore, the company could establish additional partnerships also with other non-music technology firms. Finally, Spotify could develop new digital contents to be distributed across its current music streaming users via its already operative platform.

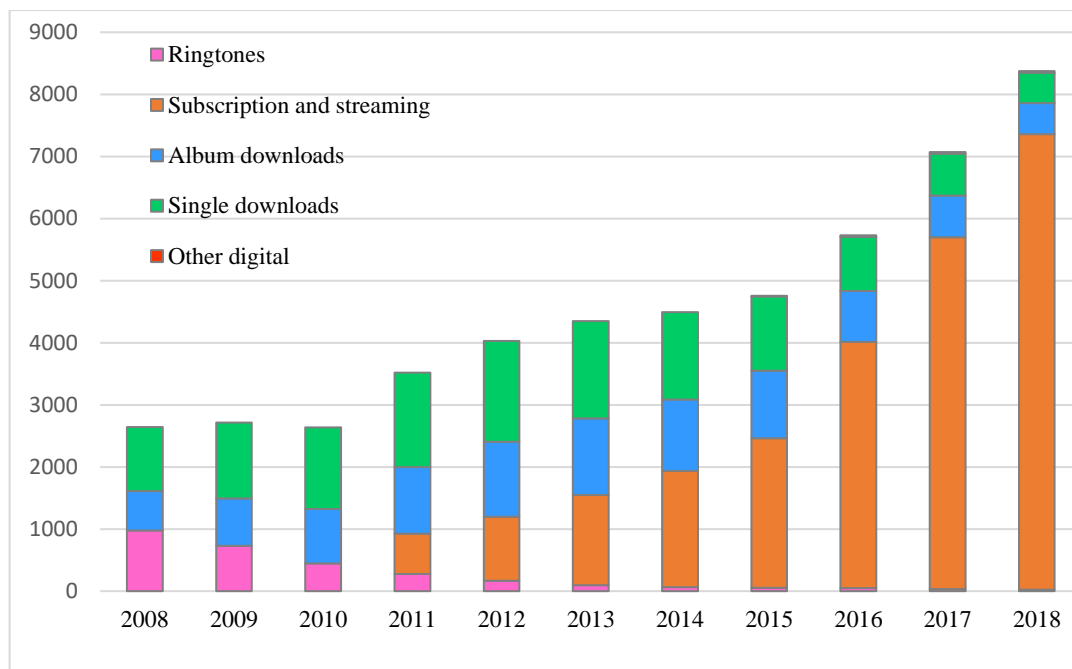


Figure 10: Digital music revenue in the period 2008-2018. Data in millions of US\$ (source: Statista website available at <https://www.statista.com/statistics/186710/digital-music-revenue-in-the-us-since-2008/>)

4.2 – SPOTIFY’S DIRECT LISTING PROCESS

Once described Spotify’s business model, financial results and market positioning, the following paragraphs will analyse the company’s listing process. Spotify’s went public on April 3, 2018, on the New York Stock Exchange. Before this date, and since the announce of the company’s public debut through an unconventional way of listing, the event interested the opinion of many institutions, journals and organizations, even not involved in initial public offerings issues. Spotify can indeed be considered the first company to list through a direct public offering in a traditional stock exchange market like the NYSE. In the past there were in fact other cases of disintermediated public offerings, but they were primarily undertaken by very small firms or spin-offs in over the counter markets. Spotify’s case instead drew much more attention even because, in order to allow a direct offering to take place, the NYSE had to obtain Securities and Exchange Commission’s approval to change its listing rules; public

opinion was therefore divided among who wished that Spotify's approach and NYSE granting would have encouraged other companies to do the same, reversing, at least partly, the strict IPOs landscape, and who instead feared this potential change.

The aim of this section however is not that of reporting the various comments and criticisms expressed on the advisability of the choices made by Spotify: the goal of this dissertation is indeed not that of illustrating the direct listing phenomenon *per se*, but that, if possible, to analyse the existence of a relation between it and the stock underpricing. The section will therefore describe in detail firstly the reasons which could have brought the company to the choice of a DPO and secondly the overall process; in particular, NYSE *ad hoc* rules, roles and actions of the subjects involved in the listing will be deeply presented; finally the third part will be dedicated to the description of pre-listing valuations, to their supposed influence on the determination of the reference stock price, and to the prices reached soon after the stock debut.

Reasons behind the choice of a DPO

As of March 2018, the principal shareholders of Spotify were those reported in Table 26. Company's founders, Daniel Ek and Martin Lorentzon, though having less than 50% of ownership, through beneficiary certificates held the majority of total voting rights, 37.0% and 43.5% respectively. The third relevant shareholder was represented by Tencent, the Chinese social media group detaining the 9% of Spotify's shares. The remaining was owned by two investment funds, Technology Crossover Ventures (TCV) and Tiger, and by one of the main content providers, Sony Music. Together, as shown in Figure 11, they represented the 67.6% of Spotify's outstanding shares and held the 84% of total voting rights.

Principal Shareholders	N. of ordinary shares	% of ownership	% of total voting rights
Daniel Ek	49,594,360	27.1%	37.0%
Martin Lorentzon	23,612,720	13.1%	43.5%
Sony Music Entertainment	10,164,560	5.7%	1.8%
Entities affiliated to TCV	9,616,720	5.4%	1.7%
Tencent	16,152,440	9.1%	-
Tiger Global	12,801,280	7.2%	-

Table 26: Spotify's principal shareholders as at March 2018 (source: own elaboration based on company's Registration Statement, March 2018)

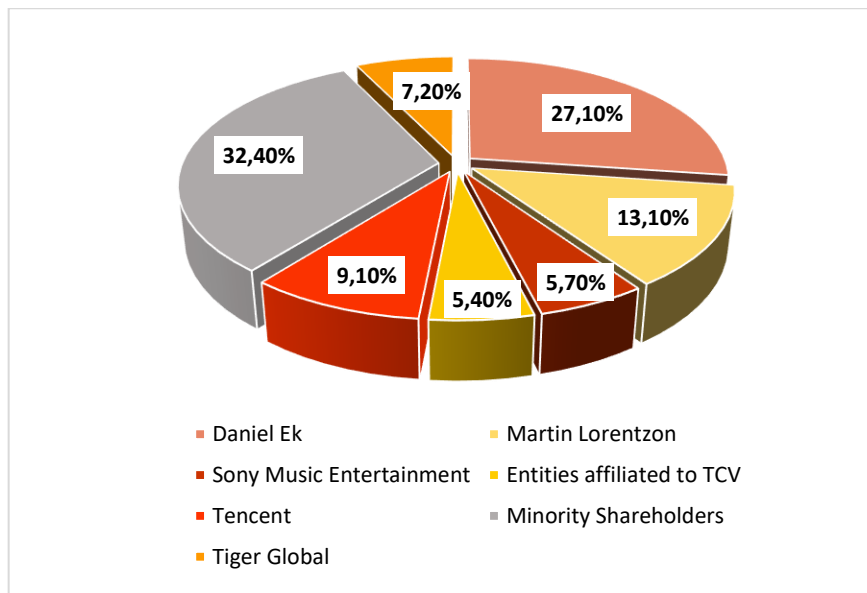


Figure 11: Spotify shareholders by ownership as at March 2018 (source: own elaboration based on company's Registration Statement, March 2018)

Direct public offerings, as already seen in Chapter 1, do not involve the issuing of new capital but just provide for the listing of existing shares. In this sense, Spotify made no exception. It indeed offered on the NYSE up to 55,731,480 of the total 178,112,840 ordinary shares outstanding at the time of the listing, more than the 30% of the outstanding share capital. The operation sounds therefore like majority shareholders giving minority shareholders the possibility to diversify the investments made, creating a liquidity event. The advantages with respect to a traditional IPO are that, first of all, existing shareholders do not suffer any ownership dilution, and then that, even though some shareholders decide to divest, shareholders base could not become as wide as when fresh capital is issued. Additionally, Spotify could have opted for a DPO since it was already able to generate cash flows after having subtracted its investing and financing activity (2015 and 2016 increases in cash were respectively equal to €371 million and €190 million, while there was a net absorption of cash during 2017).

However, having carefully analysed Spotify's Registration Statement and extraordinary operations before the public offering, what has been just described seems to be only a secondary reason. Considering recent equity exchanges with Tencent Music Entertainment and conspicuous business acquisitions aimed at expanding the company's intangibles portfolio and total asset size through the increase of goodwill, Spotify's first intention of going public could have been that of using company's stock as payment consideration for future acquisitions. In this way, company's inorganic growth prospect could have increased company's quality. Moreover, the use of a DPO could have corroborated potential investors opinion about the company because on one hand, the fact that Spotify did not need to raise capital with an IPO

was a signal that private debt and equity markets were adequate to fund the company in the near future, and on the other hand, the absence of investment banks in the role of underwriters was a proof of the company’s confidence about its own disclosures. If these elements were enough to obtain investors’ approval, Spotify could choose to issue new capital in the future without being too much concerned with it, since in this case it would have already established a pre-determined value on the market.

Of course, among Spotify’s considerations when choosing for direct listings, there were also reasons like the saving of many fees and indirect costs. First, the fact that there was no investment bank determining an offering price²⁹ could have forced the market to strongly rely on the positive valuation obtained by the company in recent transactions³⁰, and could therefore have eliminated the need for investment banks’ price support. Second, the shorter time and the fewer activities assigned to investment bank, should have lowered overall banks’ fees. Third, the disintermediated nature of the sale of shares and the assumed reliance on fair previous valuations, should have enabled Spotify to leave on the table a lower amount of money. Table 27 reports expenses related to the DPO process declared by the company in its Registration Statement: as can be observed, of the nearly \$46 million expenses, the most conspicuous item is always represented by fees paid to advisors, in particular financial ones, amounting to \$35 million. However, this amount is not extremely high if compared with the \$100 million cashed in by investment banks during a traditional IPO like the one of Snap in 2017³¹.

DPO EXPENSES	
SEC registration fee	\$55,357
Listing fee	\$320,000
Printing costs	\$875,000
Auditors' fees	\$1,848,900
Legal fees and expenses	\$5,544,965
Transfer agent and registration fees	\$73,806
Other advisers' fees	\$35,000,000
Miscellaneous fees and expenses	\$2,000,972
Total Expenses	\$45,719,000

Table 27: Spotify’s DPO expenses (source: own elaboration based on company’s Registration Statement, p.187, March 2018)

²⁹ A reference price was established as well. See next paragraphs for all the details.

³⁰ Recent private transaction will be later discussed to the light of reference price determination.

³¹ Source: “Spotify, la quotazione diretta spaventa le banche d’affari”, Il Sole 24 Ore (2018).

Spotify's DPO preparation

Within a listing system designed around repetitive phases of traditional IPOs, Spotify had to work closely with the Securities and Exchange Commission, with the NYSE staff, and with financial and legal advisors to achieve the goal of direct listing. The unusual way of listing required in fact to adapt, delete or update some typical rules and phases of IPOs.

Starting in 2017, several meetings and confidential submissions were organized first with the NYSE and then with the SEC in order to obtain the approval to the direct listing. The outcome of them was primarily an amendment to the rule regarding the registration requirements on the stock exchange. Usually, indeed, the NYSE has the faculty to list private companies that previously have not been registered with the SEC if these companies can demonstrate a \$100 million aggregate market value of publicly held shares; this valuation has to result from both an independent third party valuation and from the most recent price reached during a transaction on a private placement market. Private companies must in fact present a sustained trading activity over several months. Spotify, although having performed some recent private transactions, did not fully meet this last requirement. As a consequence, in order to permit the direct listing of a company like Spotify, in March 2017 the NYSE began the formal rule filing process with the SEC, which was successfully completed in February 2018: it allowed the SEC to accept direct listing as long as the resale registration statement is considered effective. The new rule provides an exception to the private placement market trading requirement for issuers that, first, have a recent valuation from an independent third party indicating at least \$250 million in aggregate market value and that, second, engage a financial advisor to be consulted by the NYSE's designated market maker (DMM) – which in the case of Spotify was Citadel Securities – in determining the opening trading price. Pursuant to this, Spotify engaged Morgan Stanley & Co. LLC. In addition, the company also hired Goldman Sachs & Co. LCC and Allen and Company LCC as financial advisors helping Spotify to define objectives for the listing, to advise on the registration statement, and to assist in preparing presentations and other public communications. However, unlike in a traditional underwritten IPO, they did not join investors meetings and they did not facilitate and coordinate price discovery activities or sale of ordinary shares.

In connection with this change, NYSE also modified some specific rules. For Rule 15, that sets the requirements to follow from the DMM in determining the pre-opened indications – the price range within which the opening price of a security is anticipated to occur – the definition of reference price was changed: while in a traditional IPO it indicates the offering price set by the leading investment bank in consultation with main prospective investors and with the issuing

company, for direct listing companies it is assumed to be the most recent transaction price if the company had recent sustained trading in a private placement market, or, alternatively, a price determined by the stock exchange in consultation with a financial advisor of the company (NYSE Information Memo, 2018). Therefore, for Spotify the initial reference price, that was published to the market pre-trading, was determined by NYSE staff in consultation with Morgan Stanley, the company’s “leading” financial advisor; the two arrived at a reference price per share equal to \$132. Table 28 shows Spotify ordinary shares price history in the most recent private transactions before the direct public offering: as can be observed, the reference price of \$132 strictly reflects the highest price at which shares were previously sold in private transactions. In particular, in the month of January 2018, 600,000 ordinary shares were sold: the highest registered price in this round was \$132,50. During March then, so few days before the listing became effective, nearly 5 million of ordinary shares, equal to the 3% of outstanding capital at the time, were sold: the highest registered price in this third round of 2018 was \$131.88.

	Per Share Sale Price		N. sold Ordinary Shares	N. outstanding Ordinary Shares
	High	Low		
January 2018	\$132.50	\$90.00	600,000	176,903,360
February 2018	\$127.50	\$95.00	2,174,760	176,976,280
March 2018	\$131.88	\$48.93	4,957,760	178,112,480

Table 28: Spotify’s share prices in 2018 private transactions before the DPO (source: own elaboration based on company’s Registration Statement)

Therefore, the NYSE and Spotify’s financial advisor seem to have strongly relied on previous private market transactions to determine the company’s initial reference price, maybe also because they represented a small but still significant percentage of outstanding shares. In a traditional IPO, it would have represented the offering price determined by the leading underwriter in consultation with the other investment banks and with the company, after having tested investors’ feelings and interests about the deal during the bookbuilding phase. Moreover, it would have been the price at which the same underwriter would have underwritten offered shares and then allocated to institutional (favoured) investors in the primary market, that would in turn subsequently have sold the shares in the secondary market at higher prices. As has been widely discussed, offering price determination through bookbuilding often involves behavioural compromises which do not deal with company’s real valuation. In the case of Spotify instead, where there was no investment bank underwriting and allocating shares at the reference price of \$132 as it will be later discussed, the initial “offering price” was based on more robust and substantial elements: prices of recent private sale transactions.

Other rules that were modified for the accommodation to direct listing were Rule 104 and Rule 123D. To Rule 104, that sets forth the responsibilities and duties of the DMM, was added that “[...] when facilitating the opening on the first day of trading of a NYSE Direct Listing that has not had recent sustained history of trading in a Private Placement Market prior to listing, the DMM will consult with a financial advisor to the issuer of such security in order to effect a fair and orderly opening of such security” (NYSE Information Memo, p.2). Rule 123D was instead revised so to allow the exchange to declare a temporary regulatory halt in some securities.

Once obtained SEC approval to direct listing, Spotify could prepare and present its resale registration statement using, as a foreign private issuer, form F-1. The document allowed shareholders whose shares were registered in the Registration Statement to resell them as long as the Registration Statement would have been effective: for this purpose, the statement remained effective for 90 days since the first day of listing, during which all shareholders, except for Tencent that had signed a lockup agreement, had the possibility sell their shares. The content of the document tracked that of the registration statements of IPOs, except for the presence of a “plan of distribution” section, which mainly describes the role of the NYSE’s designated market maker and clarifies that the activities of opening the shares for trading and facilitating a market for Spotify’s shares would have not been performed in consultation with the company.

As in a traditional IPO, in order to market the offering, Spotify was engaged in various investors education meetings and on March 15, it organized an Investor Day, having contents similar to a roadshow presentation. At least fifteen days before the event, Spotify was required to publicly file the registration statement including a red herring prospectus, in which the company provided a price range indication together with the high and low sales prices per share of recent private transactions. During the Investor Day the entire leadership team of Spotify discussed some presentations, and what is more, made them publicly available to everyone who wanted to join them, without restrictions, through a website. On March 23, the SEC declared Spotify’s Registration Statement effective.

Spotify’s effective listing

As Spotify chose the novel of direct public offering to list, it wanted the overall process to be as fair and transparent as possible. For this reason indeed, not only the reference (offering) price of \$132 was determined on the basis of the highest last available private sale prices, but also the opening price was defined through a different mechanism: it did not tracked previously set

offering price like in traditional IPO, but was a simple market trading price. Opening price was in fact the single price at which buy and sell orders collected by the NYSE broker-dealers matched (following the single price auction rule). The DMM that had to set an opening market price, pursuant to NYSE directions, was free to consult with Morgan Stanley, which however did not have the same information as in the case of a bookbuilt offering. Morgan Stanley was therefore expected to provide input to the DMM regarding its own understanding of the ownership of outstanding ordinary shares and of prelisting selling and buying interest on them, only relying on investors and shareholders of the time, without coordinating in any way with the company. The opening price however has inevitably been partly influenced by pre-opening indications published one by one by the DMM about the price range at which ordinary shares could open the first day of trading, as indeed happens for an underwritten initial public offering. In addition Spotify also specified in the Registration Statement (p.46) that, since the company benefits of a broad consumer awareness, “individual investors may have a greater influence in setting the opening public price and subsequent public prices of our ordinary shares on the NYSE and may have a higher participation in our listing than is typical for an underwritten initial public offering. This could result in a public price of our ordinary shares that is higher than other investors (such as institutional investors) are willing to pay”.

On April 3, Spotify therefore opened the trading on the NYSE at a price of \$165.90 per share, approximately 25.7% higher than the reference price of \$132. Company’s and market expectation, as declared in the Registration Statement, was a significant initial price volatility. According to these expectations indeed, the lack of an investment bank underwriting the shares and selling them at the reference-offering price would have impacted the range of buy and sell orders submitted to the NYSE. Among the major risks, there was that of a sharp and significant decline in the price of the shares. On the contrary, the first day of trading was characterized by a high trading volume – 30,526,507 shares were traded of the potential 55,731,480 total shares that could be sold – and by a relatively low price volatility, averaging 12.3%. The highest reached price was \$169.00 while the lowest was \$148.26. Spotify stock then closed at \$149.01 per share, obtaining a market valuation higher than \$26.5 billion which, according to Dealogic, made Spotify the eight-biggest technology initial public offering after the first day of trading.

The closing price was therefore approximately 10.2% below the opening price but 12.9% above the reference price: if Spotify had listed using a traditional underwritten IPO, but the offering price had not been determined through the bookbuilding approach but simply using more unbiased parameters like recent private transactions, the company would then have suffered an underpricing level approaching 13%. Overall, the listing day accomplished Spotify’s main

goals in this process by providing liquidity to the company's shareholders, equal access to all buyers and sellers, a transparent process, and a trading price that was determined by market-driven supply and demand forces.

4.3 – CONTEMPORARY INTERNET-RELATED IPOs

The previous section described the DPO process which took Spotify public. As explained, the company did not lose any money tied to a real stock underpricing, since there was no underwriter initially selling the shares at the reference price. The first trading on the public stocks indeed realized at the market clearing price. However, merely on theoretical terms, also the case of Spotify direct listing could be deemed underpriced at a level of 13% with respect to the reference price. This section wants therefore to understand how fair this potential degree of underpricing could be in comparison with other Internet-related IPOs which took place in the same period of time and in the same stock market. Next paragraphs will present the sample data used in the research, the data sources and the most important variables analysed. Then a sort of descriptive analysis of the IPOs is performed, that will highlight which are the main principal characteristics of the reported Internet-related IPOs and their eventual relationships with shares underpricing. Finally, the last part will discuss the most important differences between the Spotify's DPO and other Internet IPOs.

Data and data sources

The sample collected is composed by 26 IPOs completed on the NYSE and on the NASDAQ in the period between April 2016 and December 2018. The selection of the period was dictated by Spotify's offering date: since the company listed in 2018, it is reasonable to compare it with other Internet IPOs that took place in the same year or just few years before; taking older Internet IPOs would have biased analysis results, including particular phenomena such as the Dot-com bubble or the 2007-2009 financial crisis. The choice of NYSE was then made both because Spotify listed on that market and because it is considered the largest stock market in the world by market capitalization³²; NASDAQ represents instead the preferred market by the most important high-tech companies and Internet firms in the world. Table 29 reports collected data about IPO offerings and companies together with the relative sources.

³² Source: "Monthly Reports", World Federation of Exchanges (WFE).

COMPANY DATA	DATA SOURCES
- IPO name - SIC code - Offer date - Offering price	Jay R. Ritter website: “A list of Internet IPOs (1990-2018)”
- First day closing price	IPO Scoop website: ”Scoop Track Record from 2000 to the present”
- Stock market - Shares offered - Share outstanding	Companies’ Registration Statements available on respective websites
- Companies incorporation date - Products/services - Revenue	Companies websites

Table 29: IPO data and data sources used in the research (source: own illustration)

The list of Internet-related IPOs, firms’ SIC (“Standard Industrial Classification”) code, offer date and final offering price, have mainly been obtained from Jay R. Ritter’s website³³. According to Ritter’s, there have been 28 Internet-related IPOs in the period 2016-2018. The sample used in this research is instead reduced to 26 Internet IPOs, after having excluded two IPOs for which data were not complete and fully available. Data about the first day closing price have been taken from IPO Scoop website³⁴. Data about the stock market in which companies listed, the number of offered shares in the IPO and the ordinary shares outstanding at the time of the IPO, needed to calculate the total money left on the table and firms’ market capitalization, have been collected from each company registration statement; number of offered shares and consequently the number of ordinary shares outstanding after the offering do not include eventual additional shares in the case of exercise of the overallotment option. Companies incorporation dates, needed to calculate the age of the company at the time of the IPO, products or services offered by the company, and revenue of the company of the last available yearly financial statements before the IPO have been found in companies’ websites.

Variables description

In order to analyse the sample, variables described in Table 30 were used. First of all, IPO first-day return, alternatively referred to as “initial return” or “IPO underpricing” in the following paragraphs, has been calculated using the Raw Initial Return formula seen in Chapter 3: as the

³³ “A list of internet IPOs (1990-2018)” available on Jay R. Ritter website. See <https://site.warrington.ufl.edu/ritter/ipo-data/> [access date: 20 May 2019].

³⁴ “Scoop Track Record from 2000 to the present” available at: <https://www.iposcoop.com/scoop-track-record-from-2000-to-present/> [access date: 20 May 2019].

percentage difference between the offering price and the first day closing price. Since IPOs dates just differ at most by two years, there was no need to calculate IPO underpricing using the Market Adjusted Initial Return formula. Moreover, the majority of the empirical studies reported in Chapter 3 uses the Raw Initial Return formula in order to calculate first-day initial return. IPOs are defined as underpriced when initial return assumes a positive value, that is when the first-day closing price is higher than the offering price, overpriced when the initial return is negative and correctly priced when the first-day closing price is equal to the offering price. Another variable used in the analysis and strictly connected with the one just described is the amount of money left on the table, which gives an insight of the degree of IPO underpricing in monetary terms: it is indeed calculated as the difference between the first-day closing price and the offering price multiplied by the shares issued.

VARIABLE	EXPLANATION
IPO first-day return	The IPO raw initial return (underpricing): the percentage difference between the offering price and the first-day closing price
Money left on the table	The difference between the first-day closing price and the offering price multiplied by the number of offered shares
Age of the company	The difference (in years) between the IPO date and the incorporation date
Market capitalization	The product between the final offering price and the number of shares outstanding at the time of the IPO
Ratio of shares offered	Number of shares offered in the IPO divided by total outstanding shares

Table 30: List of variables used in the research (source: own elaboration)

Other variables elaborated in order to segment the sample are: the age of the issuing company at the time of the IPO, calculated as the difference (expressed in years) between the date of the IPO and the date of incorporation of the company; the company's market capitalization (taken as a proxy of the company's size), computed as the product between the final offering price and the number of shares outstanding at the time of the IPO; finally the ratio of offered shares, calculated as number of shares offered in the IPO divided by total outstanding shares.

Descriptive analysis and results

Once described the various sources and the variables constructed, the following analysis first presents the main characteristics of the sample and tries to link them with the theoretical and empirical literature seen in the previous chapters and then tries to compare the results with the Spotify case.

As can be firstly noted from Table 31, the analysed 26 Internet-related companies of the sample show an average initial return of 30.77%. In particular, the 81% of them (21 IPOs) are underpriced, presenting an average first-day return which approaches the 40%; 12% of them (3 IPOs) do instead experience a 13.20% of overpricing and only 8% of analysed companies (2 IPOs) are correctly priced. The most overpriced company was Carvana, an online retailer of automobiles, whose initial offering price was \$15 but closed at \$11; symmetrically, the most underpriced IPO was that of Elastic NV, an enterprise search software company, which experienced a first-day return of 94.4%, with an offering price equal to \$36 and a closing price equal to \$70. However, even excluding these two outliers, the average underpricing still remains at the significant level of 30%.

	Underpriced	Overpriced	Correctly Priced	Total
Number of IPOs	21	3	2	26
% on total	81%	12%	8%	100%
Mean initial return	39.99%	-13.20%	0.00%	30.77%
Max/Min value	94.40%	-26.00%	-	-

Table 31: Descriptive statistic of the sample (source: own elaboration based on sample data)

Figure 12 reports the frequency distribution of the IPO initial return which, as could be expected, is less concentrated towards very high values. Regarding underpriced IPOs, 33% of them present a quite elevated initial return between 40% and 60%; 28% of them have an underpricing between 20% and 40% and only 19% of them suffered an underpricing lower than the 20%.



Figure 12: Frequency distribution of IPO initial returns (Source: own illustration based on sample data)

Table 32 summarizes the most relevant characteristics of the sample directly linked with the offering. As can be observed, at a first sight the underpriced subsample highlights different values in terms of average market capitalization with respect to overpriced and correctly priced

subsamples. However this is mainly due to few large technology companies biasing the mean: Snap, the camera company which launched Snapchat application, with a market capitalization higher than \$19 billion; the storage software Dropbox, having a market capitalization higher than \$8 billion; finally Stoneco (which offers cloud base online payment) and Farfetch (a luxury fashion platform) approaching the \$7 billion and the \$6 billion, respectively. The majority of the underpriced companies presents indeed a market capitalization between \$1 and 2\$ billion. Regarding the offering price, although calculating an average of it will always be imprecise, underpriced IPOs seem also to receive a higher valuation (\$19.57) with respect to overpriced (\$16.33) and correctly priced IPOs (\$12.00). Considering the ratio of offered shares on the total market capitalization instead, underpriced and overpriced subsamples both present a ratio of 18%. Internet IPOs of this sample then left a total amount of money on the table of approximately \$181 million.

	Underpriced	Overpriced	Correctly Priced
Mean offering price	\$19.57	\$16.33	\$12.00
Mean market capitalization (US\$ millions)	2,978	1,057	1,024
Mean ratio (offered shares/mkt cap)	18%	18%	44%
Mean money left (US\$ millions)	\$181	-	-

Table 32: Descriptive statistic of the sample (source: own elaboration based on sample data)

Figure 13 further highlights how the level of initial return varies with firms' market capitalization. Seven ranges of market capitalization are compared with the corresponding mean initial return for the IPOs included in the sample. It is possible to figurately distinguish two paths: firms having a market capitalization smaller than \$1 billion show a moderate first-day return ranging from 10% to 17%; the rest of the companies instead does not present great variance in the mean initial return: the means are all concentrated between the 30% and the 40%. In particular, Snap, the company of the sample presenting the highest market capitalization supported an IPO underpricing of 44.0%, while Dropbox, the second largest company by market capitalization, registered a 35.6% first-day return. Regarding this sample therefore, underpricing seems to be positively correlated with market capitalization, but only until a certain level.

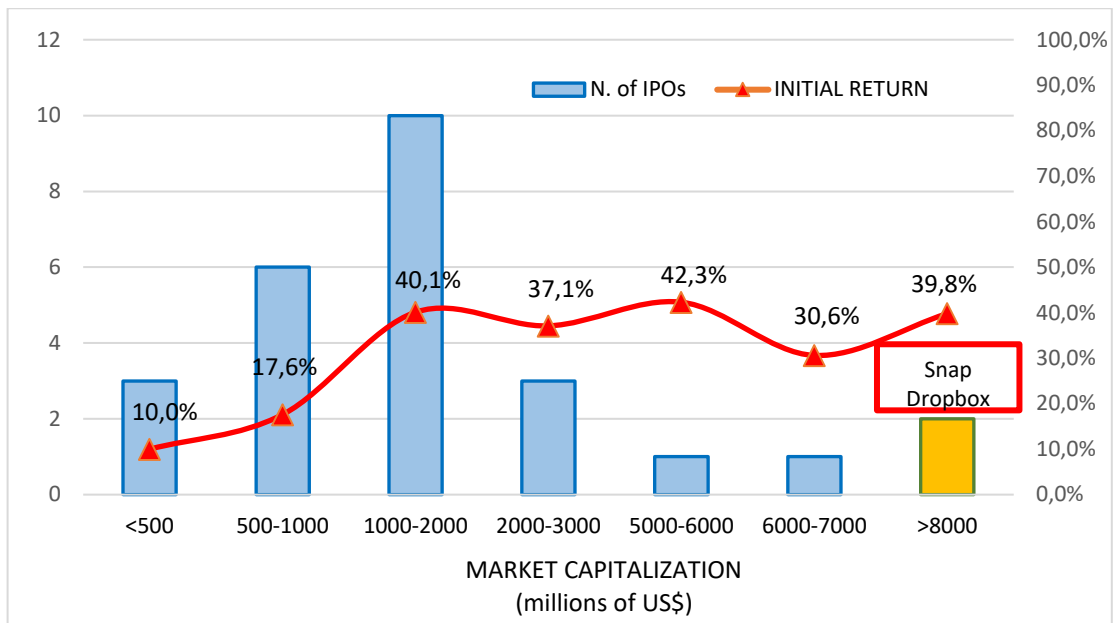


Figure 13: Mean initial return for different ranges of market capitalization (source: own illustration based on sample data)

Another frequently firm specific factor taken into consideration when discussing IPO underpricing is companies' age at the time of listing. Among others, Laughran and Ritter (2004) and Lowry, Officer and Schwert (2010) empirically proved that underpricing is generally more severe for young firms, being their valuation more uncertain. Observing Figure 14 however, which reports mean initial returns by companies age, it seems to be no relation at all. This outcome could be due both to the small size of the sample that does not allow to find absolute results and probably also to the fact that the "Internet" feature pools IPOs of different ages in terms of underpricing.

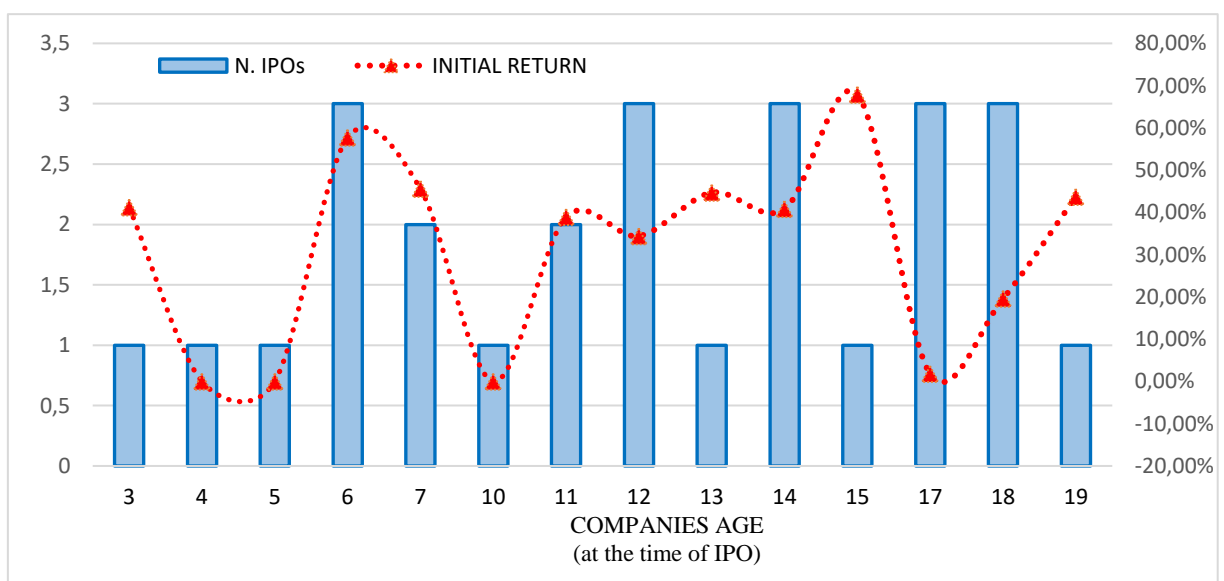


Figure 14: Mean initial return by companies' age (source: own illustration based on sample data)

Although, as explained before, the analysed period is selected so to avoid external distortions, some differences in underpricing level could be underlined also distinguishing for the three analysed years. As displayed in Table 33, 10 companies of the sample went public in 2017 and 11 during 2018; only 5 companies listed instead during 2016. For this reason, it seems more appropriate to compare 2017 and 2018 results. 2018 average level of underpricing is decisively higher than 2017's, attesting at 46.5% versus 16.2%. During 2018 moreover, no firm was overpriced, as report data regarding the maximum and minimum level of initial return reached in each year. When comparing yearly mean initial returns of the IPOs in the sample with those of all IPOs conducted in the analysed period (Ritter, 2018), the result is a higher degree of underpricing for Internet-related firms: Loughran and Ritter (2004), DuCharme, Rajgopal and Sefcik (2001) and Arosio, Giudici and Paleari (2000) findings, demonstrating that Internet-related IPOs are generally characterized by more severe underpricing than other IPOs, seem to be validated also by this small sample. In particular, the greatest difference in mean underpricing of only Internet firms and that of all IPOs, is much prominent during 2018 (46.5% versus 18.6%, respectively).

Year	N. of IPOs	Mean Initial Return of Internet IPOs	Men Initial Return for all IPOs	Max – Min Initial Return
2016	5	24.5%	14.6%	67.2% - (3.1%)
2017	10	16.2%	13.0%	67.9% - (26.0%)
2018	11	46.5%	18.6%	94.4% - 1.6%

Table 33: Descriptive statistic of the sample compared with general data (Source: own elaboration based on sample data and on Ritter's data available on https://site.warrington.ufl.edu/ritter/files/2019/03/IPOs2018_Underpricing.pdf)

Spotify's direct public offering therefore took place in a year characterized by a particularly high level of underpricing: 2018 first-day return, averaging around 46% is indeed more than three times the potential level of underpricing that Spotify would have suffered in the case of a traditional underwritten process, 12.9%. In terms of offering terms, no IPO would be appropriate to be compared with Spotify. The global leader of the music streaming did in fact obtain a valuation in terms of reference price of \$132, while the highest offering price of the IPOs in the sample is that of Elastic NV, equal to \$36. The company also distances the other IPOs by considering its market capitalization: \$23.5 billion against a mean of \$2.8 of the sample. Despite this, in order to better evaluate Spotify direct listing and reference price, the sample can be reduced to few companies, nearer to Spotify also in terms of revenue and services offered. Table 34 shows selected IPOs and reports corresponding data.

	Initial Return	Offering Year	Market Capitalization	Revenue (year before the IPO) <i>millions of US\$</i>	Age (at the time of the IPO)
Dropbox	35.6%	2018	\$8,240,489,544	\$1,106.800	11
Roku	67.9%	2017	\$1,326,478,930	\$398.649	15
Snap	44.0%	2017	\$19,673,592,890	\$404.482	6
Spotify	12.9%	2018	\$23,510,894,880	\$4,840.924³⁵	12

Table 34: Descriptive statistics for more comparable companies (source: own illustration based on sample data)

The three companies included in the table have been chosen by combining different parameters: first, although being all Internet-related companies, businesses which have more affinity with the streaming market were considered; second, revenues in the last year before the IPO year; third, companies' age at the time of the IPO. Market capitalization has also been taken as a relevant criterion. The reduced sample is therefore composed by:

- Dropbox, a software working on the storage of different types of data on the Internet, which may be an important future partner for Spotify in the management of data about users' preferences; as Spotify, it went public in 2018, 11 years after its incorporation, but it differently chose the NASDAQ as stock exchange; it presented about \$1,107 million in revenue in 2017, obtaining a capitalization higher than \$8 billion; it registered an underpricing equal to 35.6%.
- Roku, an American company offering a series of online media players, among which movies and music, through its own mobile device; hence, it can be considered among Spotify's smaller competitors; Roku listed in 2017 on the NASDAQ, 15 years after its incorporation date; during 2016 it recorded revenues for nearly \$399 million; with a market capitalization higher than \$1 billion, its shares experienced a significant initial return, equal to 67.9%.
- Snap, the company based on the technology of the camera, went public on the NYSE during 2017, quite young, only 6 years after its foundation; it both could be a partner, a competitor, or even a future business acquisition for Spotify; 2016 revenues amounted to \$404 million; market capitalization, as already said, is particularly high (\$19 billion) and initial return is consistent as well (44.0%).

Therefore, also taking into account only the most comparable IPOs of the sample, artificial initial return of Spotify still remains largely lower with respect to the three IPOs presented

³⁵ This number was calculated as the product of 2017 Spotify Euro revenues (4,090) times the exchange rate USD/EUR at 31/12/2017, equal to 1.1836 (source: "Tassi di cambio storici mensili" on Banca d'Italia website).

above. Several are the common elements between them and Spotify: firms' age at the time of the IPO (Dropbox is the nearest one), business sector (Roku) and market capitalization (Snap). Although these similarities, the three identified IPOs present an average underpricing 36 percentage points higher than Spotify's one (49% versus 13%). The reason of such a result must therefore be found in other elements, as the mechanism used to determine the reference-offering prices.

4.4 – THE VALUATION OF SPOTIFY

As many other large technology firms, the value of Spotify was difficult to be evaluated at the time of the DPO. The only certain available references were the sale prices at which company's shares had been sold few months before the DPO. As already discussed, the company's initial reference price (\$132) – published by the DMM on the NYSE that could have partially influenced buy and sell orders prices – was determined on the basis of those transactions. The resulting artificial initial return (12.9%) was extremely low in comparison with other technology Internet-related IPOs which went public in the same year (46.5%). Hence, the question is whether Spotify has been overvalued or not during the pre-listing phase; that is, whether the reference-offering price of the company was set too high, so to result in a reduced underpricing with respect with other IPOs, or whether it was instead correctly priced or even set below the real value of Spotify's shares.

To estimate if the reference price of Spotify was correctly set, this section will first provide an evaluation of the company using Discounted Cash Flow (DFC) methodology, which will be then corroborated by a sensitivity analysis on the main critical variables of the model; finally, the DCF results will be compared with a Multiples analysis.

Discounted Cash Flow analysis

The starting point of the DCF analysis has of course been a deep and careful study of the economic variables affecting Spotify financial performance since its incorporation date. The most important ones have already been largely discussed in the first section of this chapter regarding Spotify's historical financials and for this reason this paragraph will not fully replicate them. Nevertheless, references at Spotify's historical data will be made whenever necessary to better understand financial projections.

In the DCF analysis it has been used an explicit forecast period of 10 years. Spotify's value beyond the explicit forecast period is estimated through the terminal value formula. Unfortunately, Spotify's Registration Statement did not report any specific forecasts value, so all the assumptions made to perform the company's analysis were arbitrary determined as follows³⁶.

Revenue growth is assumed to be quite sustained during the first five years of forecasts (2018-2022) and more moderate in the last five years (2023-2027). In particular, the used annual revenue growth for 2018 is 39%, decreasing by 1 percentage point each year until 2022; the revenue growth assumed for 2023 is instead 33%, steadily declining year by year until reaching a level of 20% in 2027. Three methodologies were evaluated when trying to assess revenue forecasts. One possibility was that of taking comparable companies in terms of business, age and growth which went public some years before Spotify and simply replicate the growth they experienced in revenues after their IPOs. However, only two listed companies could be eligible, Pandora and Netflix. Nevertheless, Netflix listed on the NASDAQ during 2002: taking Netflix 2003 revenue growth could be highly misleading since, from that time, macroeconomic conditions changed significantly; Pandora listed on the NYSE during 2011, at an age of 11 years, the same of Spotify; however, because Pandora only operated in some specific countries and did not have the same global presence as Spotify had at the time of the IPO, neither this last company's revenue growth seemed appropriate to reflect Spotify's prospects. Another methodology which could have been used was that of relying on macro studies performed at industry level, as Damodaran does for instance; nevertheless, as the average datum also includes small and medium technology firms, it would have implied too much generalization that would not have properly reflected the company's history. For these reasons, the used method was the historical approach. As already analysed in the first section of this chapter, Spotify experienced a rapidly and extraordinary growth in its start-up phase; from 2013 revenues were still increasing at sustained paths, as confirmed by the CAGR of 53% during the period 2013-2017. The three years before the DPO were still good, although presenting a decline in the revenue growth rate: 75.48% in 2015, 55.04% in 2016 and 38.55% in 2017. In the first section of this chapter it was highlighted how the company was able to increase quarter by quarter the number of its monthly active users, especially premium ones which represent the most conspicuous source of income: only from the first quarter of 2015 to the last quarter of 2017, Spotify's premium subscribers increased from 18 million to 71 million. However, with an average of total

³⁶ All the tables regarding the forecasts described in this paragraph can be found in the Appendix B.

monthly active users of 157 million, the company has still the possibility to convert a large part of them into paying users, at a level high enough to sustain the revenue growth reached in 2017.

COGS growth has been tied to revenues by forecasting the ratio between cost of goods sold and revenue level year by year. COGS over revenue is assumed to be 75% in 2018, slightly decreasing during the first five years of projections until stabilizing at a level of 68% in 2023. As already discussed, COGS mainly includes royalties and distribution costs paid by Spotify in order to acquire rights to stream protected contents. Although being always really high, in the last couple of years before Spotify's DPO these costs stabilize around 78% of total revenue. 2018 assumption of 75% could hence seem a little too optimistic, but it takes into account future benefits from Spotify's recent agreements with main media companies aimed at changing, at least partly, the way in which these costs are computed: as analysed in the section dealing with risks and opportunities of the company, this is a necessary action for Spotify in order to keep grow.

R&D, sales and marketing, general and administrative expenses: these expenses have all been forecasted on the basis of revenues, following a declining path, both by considering their percentage on revenue from 2015 to 2017 and by taking into account Spotify's declarations in the Registration Statement. Research and development over sales is assumed at 10% in the first years of forecasts, then decreasing towards 7% in the last explicit year; since Spotify affirms it is keeping investing in order to better connect its users and to enlarge its offering beyond music streaming, these expenses remain at 10% at least until 2020. Sales and marketing expenses over sales are instead assumed to be more conspicuous, at 14%, from 2018 to 2020, since the company is expected to increase these costs as competition becomes more tightened. Finally, general and administrative expenses over sales are taken at an average level of 5.50% over the 10 years.

Operating tax rate could not have been inferred from Spotify's previous financial statements, since the company has always been in loss. Therefore, as it is also disclosed in the company's Registration Statement, the considered tax rate is the corporate tax rate applied by Luxemburg, equal to 27% for each of the explicit forecast years.

Working capital change has been computed as the sum of trade receivables and other current assets with trade payables and other current liabilities (Spotify business nature implies indeed zero inventory). Trade receivables have been forecasted using DSO (days sales outstanding), which during 2017 have been equal to 32 days; therefore, they have been rounded to 30 days for the entire forecast period, as also disclosed by the company in the Registration Statement.

Trade payables have instead been forecasted as percentage of COGS: as in 2017, they have been kept at 11% of COGS until 2019, while they then slightly improve as the firm starts to make profits. Other current assets and liabilities are instead maintained quite stable at the levels of 2017.

CAPEX (capital expenditures) has been calculated as the sum of net investment in property, plant and equipment and acquisitions in intangible assets, excluding goodwill. Usually the DCF analysis does not consider, for the sake of operating free cash flows, the acquired intangible assets; however, since the success of the company is partly linked to its capability of acquiring developed technology and patents, also this type of investment is considered as operating. CAPEX in property, plant and equipment is forecasted on the base of sales with a decreasing tendency: PPE percentage on revenue is assumed at 3% in 2018 till 1.20% in 2027; it is a very low rate considering a company that could still grow, but it is realistic if considering that Spotify's operations mainly require only data centres and that the same company declared in the Registration Statement (p.127) that "our current facilities are adequate to meet our needs for the near future and that suitable additional or alternative space will be available on commercially reasonable terms to accommodate our foreseeable future operations". CAPEX in intangible assets are also taken as percentage on sales: it is assumed at 3% of revenues for the first five forecast years and 2.5% for the remaining five.

Amortization and depreciation have been instead forecasted as percentage of related fixed assets. Depreciation has been computed as the 60% and 50% of PPE during 2018 and 2019, respectively, and has then been taken constant at 40% for the remaining years. Amortization of intangible assets cannot be precisely forecasted: however, it is assumed to be at 30% of intangibles, net of goodwill, for the whole forecast period.

Cost of capital has been taken from Damodaran WACC reports. The industries considered in computing Spotify's weighted average cost of capital were software-entertainment, software-Internet and software-systems and applications: the resulting average is a weighted cost of capital of 10.8%³⁷.

Final growth rate, needed to determine DCF terminal value, has been considered at 2%, that, also according to Damodaran (2017), is the most used final growth rate for the DCF analysis.

As it is reported in Figure 15, the DCF analysis brought to a value per share of \$147.74, 12% greater than the initial reference price set at \$132. Estimated value per share is instead really

³⁷ Data available on Damodaran website at http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/wacc.htm [access date: 09/09/2019].

close – only 0.9% lower – to the price at which Spotify closed its first day of trading, \$149.01. This first result suggests two main primary conclusions about the company's valuation: first that the market is efficient in determining informative and fair prices of stock; and second, that, although having not sustained real indirect costs related to shares underpricing, also Spotify has been, at least at the first instance, arbitrary undervalued – and therefore underpriced – by the stock exchange (the NYSE) and the lead financial advisor (Morgan Stanley). However, in order to draw some solid conclusions, this first analysis will now be tested by a sensitivity analysis on the most important and key variables and by a Multiples analysis using Spotify's main competitors.

<i>Data in millions of €</i>	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue	4.090	5.685	7.845	10.748	14.618	19.734	26.246	34.120	42.650	52.033	62.439
COGS	3.241	4.264	5.806	7.846	10.232	13.814	17.847	23.201	29.002	35.382	42.459
Gross Profit	849	1.421	2.040	2.902	4.385	5.920	8.399	10.918	13.648	16.650	19.981
Research and Development	396	569	785	1.021	1.316	1.677	2.100	2.730	2.985	3.642	4.371
Sales and Marketing	567	796	1.098	1.505	1.900	2.565	3.150	3.753	4.265	5.203	6.244
General and Administrative	264	370	471	645	877	1.145	1.444	1.808	2.132	2.602	3.122
EBIT	- 378	- 313	- 314	- 269	292	533	1.706	2.627	4.265	5.203	6.244
Operating (adjusted) Taxes		-	-	-	79	144	461	709	1.152	1.405	1.686
NOPLAT		- 313	- 314	- 269	213	389	1.245	1.918	3.113	3.798	4.558
Amortization and Depreciation		153	169	183	248	312	354	433	525	640	768
Operating Working Capital Change		- 3	- 31	- 116	- 102	- 292	- 214	- 213	- 374	- 281	- 309
Net Capital Expenditures		- 395	- 259	- 289	- 442	- 508	- 477	- 680	- 806	- 987	- 1.153
Operating FCF		- 557	- 436	- 490	- 82	99	909	1.458	2.458	3.170	3.864
Discount Factor		0,90	0,81	0,74	0,66	0,60	0,54	0,49	0,44	0,40	0,36
PV of FCF		- 503	- 355	- 360	- 54	59	491	711	1.082	1.259	1.385

Final Growth Rate	2,00%
Terminal Value	44.784
PV of TV	16.059
Sum of NPV	19.657
Non Operating Assets	2.141
Enterprise Value	21.798
NFP	467
Market Value of Equity	21.331

Value of Equity	21.330.733.098
N. Outstanding Shares	178.112.840
Value per Share (€)	119,76
Value per Share (\$)	147,74

USD/EUR=1,2336 at 31/03/2018

Figure 15: Spotify DCF valuation (source: own illustration)

Sensitivity analysis

The first variables on which a sensitivity analysis was conducted are, as it is very common in the valuation framework, the weighted average cost of capital (WACC) and the final growth rate (g). As shown by Table 35 indeed, estimated value per share results highly influenced by changes in these two variables: maintaining all other assumptions unchanged and decreasing the cost of capital just to 10.0% while increasing the final growth rate to 2.5% for instance, would bring to a value per share of \$149.5, very close to the first-day closing price of Spotify. However, since DCF analysis and in particular terminal value are highly influenced by these measures, it is appropriate to maintain a more conservative approach.

		WACC						
		9,0%	9,5%	10,0%	10,8%	11,0%	11,5%	12,0%
Final growth rate	1,0%	184,0	168,2	154,3	135,4	131,2	121,5	112,9
	1,5%	194,3	176,9	161,7	141,2	136,7	126,3	117,0
	2,0%	206,0	186,7	170,1	147,7	142,8	131,6	121,6
	2,5%	219,5	198,0	179,5	155,0	149,7	137,5	126,7
	3,0%	235,3	211,0	190,3	163,2	157,4	144,0	132,3

Table 35: DCF results sensitivity analysis by WACC and final growth rate (source: own elaboration)

Beyond cost of capital and final growth rate, which are always highly debated in the framework of the DCF, as also seen in the explanation of the assumptions, the two main items which largely determine Spotify's final price per share are revenue growth and COGS. Initially, a sensitivity analysis for the each of the first three years of projections has been performed on the basis of revenue growth rate and COGS percentage over sales, as reported in Tables 45, 46 and 47 in Appendix B. Nevertheless, in order to underline the effect of contemporary changing these two variables in multiple years, two other complete scenarios have been developed with respect to the base scenario analysed in the previous paragraph.

In the more optimistic scenario, as can be seen by Table 48 contained in Appendix B, 2018 revenue growth is assumed at 40%, decreasing by one percentage point year by year until 2020, and then restabilising at revenue growth rates considered in the base model. Simultaneously, COGS over revenue is taken at 74% in 2018, 73% in 2019 and 72% in 2020; the rest of the assumptions are unchanged with respect to the base model. As can be seen from Table 36, this version brings to an estimated value per share of \$152.01, 3% higher than the \$147.74 value per share estimated through the base model.

OPTIMISTIC SCENARIO	
Final Growth Rate	2.00%
Terminal Value	45.769
PV of TV	16.413
Sum of NPV	20.274
Non operating assets	2.141
EV	22.415
NFP	467
Market value of equity	21.948
N. Outstanding Shares (ml)	178
Value per Share (€)	123,23
Value per Share (\$)	152,01

USD/EUR=1,2336 at 31/03/2018

Table 36: DCF valuation results based on the optimistic scenario (source: own elaboration)

In the more pessimistic scenario instead, as can be seen by Table 49 contained in Appendix B, 2018 revenue growth is assumed at 37%, decreasing by one percentage point year by year until 2023. COGS over sales is instead increased to 76% in 2018, 75% in 2019 and to 74% in 2020. The remaining forecast assumptions are kept at the base model level. As can be observed by Table 37, this scenario results in an estimated value per share of \$138.37, 20% lower than the \$147.74 value per share estimated through the base model.

PESSIMISTIC SCENARIO	
Final Growth Rate	2.00%
Terminal Value	42.221
PV of TV	15.140
Sum of NPV	18.305
Non operating assets	2.141
EV	20.446
NFP	467
Market value of equity	19.979
N. Outstanding Shares (ml)	178
Value per Share (€)	112,17
Value per Share (\$)	138,37

USD/EUR=1,2336 at 31/03/2018

Table 37: DCF valuation results based on the pessimistic scenario (source: own elaboration)

Therefore, assumptions made in the base model appear much more skewed towards the optimistic scenario. With the following Multiples analysis, it would be possible to assess if the estimated value per share of \$147.74 has been built on too much optimistic assumptions or if it is instead confirmed by the valuation of Spotify's comparable companies.

Multiples analysis

In order to perform Multiples analysis, 10 firms have been considered: among them six are direct competitors of Spotify, while the others are large technology companies which could become Spotify's competitors in the near future³⁸. Useful data in order to calculate EV/sales, EV/EBIT and EV/EBITDA multiples are all disclosed in Table 38³⁹.

Data in millions of US\$	P/BV	MKT CAP	NFP	EV	SALES	EV/ SALES	EBITDA	EV/ EBITDA	EBIT	EV/EBIT	EBITDA margin
Apple	6,02	879.350	23.026	902.376	229.234	3,9	71.501	12,6	61.344	14,7	31%
Amazon	20,43	594.900	6.243	588.657	177.866	3,3	15.584	37,8	4.106	143,4	9%
Bilibili	n.a.	760	193	567	379	1,5	12	47,3	34	-16,7	3%
Dropbox	24,19	6.230	29	6.259	1.107	5,7	75	83,5	114	-54,9	7%
Google	4,8	771.380	97.902	673.478	110.855	6,1	33.061	20,4	26.146	25,8	30%
Netflix	23,23	91.170	3.676	94.846	11.693	8,1	7.169	13,2	839	113,0	61%
Pandora	7,92	1.310	228	1.082	1.467	0,7	278	-3,9	493	-2,2	-19%
Roku	33,72	4.600	177	4.423	513	8,6	14	-315,9	20	-221,2	-3%
Tencent	14,14	489.460	4.820	484.640	35.188	13,8	13.365	36,3	13.365	36,3	38%
Twitter	3,55	18.180	2.694	15.486	2.443	6,3	515	30,1	39	397,1	21%

Table 38: Dataset for Spotify's multiple analysis (source: own elaboration from Macrotrends data)

To understand which of the three reported multiples could be the most appropriate to assess Spotify's enterprise value, three linear regressions were performed with respect to the EBITDA margin (last column of the Table) over the three multiples. As can be observed by looking at the regression charts (Figure 19 and 20) in the Appendix C and at the Figure 16 below, the only relation, although imperfect, seems to exist between EBITDA margin and revenue multiples.

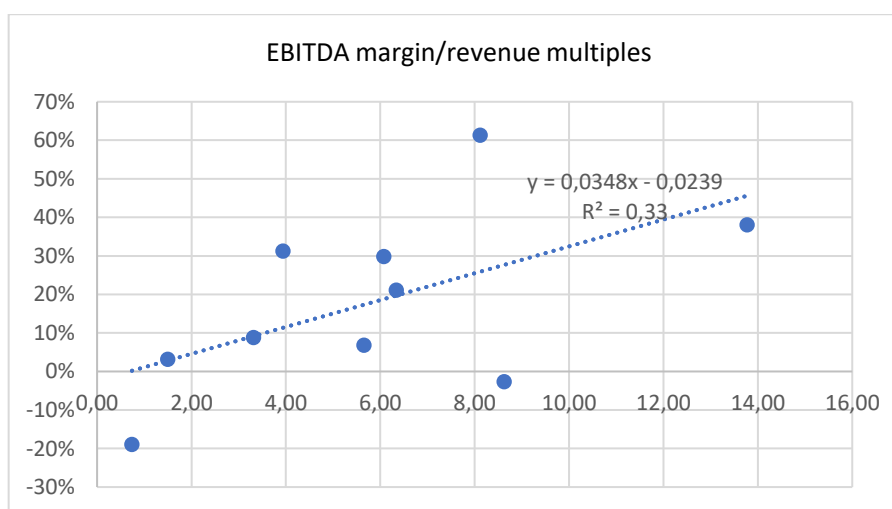


Figure 16: Regression chart of EBITDA margin over revenue multiples (source: own illustration based on sample data)

³⁸ Snap was not included in this sample, since although having all the characteristics to be considered a future competitor of Spotify, its outlier financials regarding EBIT and EBITDA would have created misleading results given the small size of the sample.

³⁹ All the data in Table reflect available value at 31/12/2017 (source: Macrotrends website).

Once decided for which multiple to use in this analysis, the calculated average EV/sales of the whole sample is 5.8x, resulting in a total enterprise value of Spotify equal to €23,744 million (2017 Spotify's revenue are indeed €4,090 million), €1,954 million higher than Spotify's EV resulting from the base scenario (€21,798 million). However, as also discussed in the first section of this chapter, Spotify's main competitors are Apple (with the offering of Apple Music), Amazon (which provides Amazon Music Unlimited and Amazon Prime), Google (since it owns both Google Play and YouTube) and Netflix (the giant of the streaming). The Chinese group Tencent, though holding Tencent Music Entertainment which could be considered among the most direct competitors of Spotify, has not been included in this list since, being participated by Spotify through a minority equity stake, it would have implied additional calculations in order to neutralize this effect. As can be observed from Table 39, restricting the sample to these firms brings the mean EV/sales to 5.4x, resulting in an enterprise value of Spotify of €21,922 million, only 1% higher than the enterprise value computed through the DCF analysis. For this reason, the value per share obtained through the base version of the discounted cash flow analysis of \$147.74 could be deemed much more reliable than the other two scenarios.

	Apple	Amazon	Google	Netflix	Mean
EV/Sales	3.9x	3.3x	6.1x	8.1x	5.4x
Spotify 2017 Revenue	€4,090				
Spotify EV (multiples)	€21,922				
Spotify EV (DCF analysis)	€21,790				

Table 39: Spotify's enterprise value through multiples valuation (source: own elaboration from the sample data)

4.5 – SPOTIFY'S DPO SUGGESTIONS

In the previous paragraphs it has been described the Spotify's direct listing process, the company's performance and situation before the DPO, and the stock market debut; additionally, it has been reported the valuation of Spotify (at the time of the DPO) performed using DCF methodology and multiples analysis. In this last section of the chapter it will instead be debated which could be the lesson, in terms of shares valuation, from the first real DPO undertaken as an alternative to traditional IPOs.

All this dissertation has been focused on the phenomenon that characterizes the majority of initial public offerings and that is often referred to as the most conspicuous indirect cost of listing: shares underpricing. However, can a DPO, and hence Spotify, really be deemed underpriced? Is it correct to speak about underpricing for direct listings like the one of Spotify? For what concerns the limited knowledge of this work, the argument has never been directly

faced and the existing literature only provides few and unclear answers about it. In the study of Spotify's case, the overall DPO process followed by the company has been deeply described: it has been seen that, although three prestigious investment banks (Morgan Stanley, Goldman Sachs, Allen and Co.) have been indeed involved in the issue, they have only played a marginal role compared to what is usually done in a traditional IPO. In specific, they did not underwrite any of the shares offered by Spotify's selling investors. They just limited – Morgan Stanley in particular being the leading financial advisor – to determine with the NYSE and with the designated market maker first an initial reference price (set at the level of \$132.00 also looking at Spotify's previous private shares transactions), and then a clearing market price (set at \$165.90 on the base of buy and sell orders received by the DMM), both without getting an opinion from the company or prospective investors. Therefore, since in the case of Spotify the first price at which shares began to be exchanged was the market clearing price, shares underpricing could not be found: company's shares were indeed not underwritten and sold by investment banks to institutional investors at the offering price, to be then resold by such investors in the secondary market at a higher price than the offering one. In other words, the company did not leave any money on the table, since no share was indeed sold at the offering-reference price and therefore no share did initially trade at discount.

From another point of view, however, all the elements necessary to ideally compute shares first-day return exist also in Spotify's direct listing. As it has been broadly observed in Chapter 3, which summarizes the most important empirical evidences of IPOs underpricing related to investment banks' role and bookbuilding process, underpricing is usually calculated as the percentage difference between the first-day trading closing price and the offering price. Since also in the case of Spotify's DPO a reference price has been determined – as required by NYSE *ad hoc* Rule 15 which substitutes the term “offering price” with that of “reference price” for direct public offerings – stocks initial return can be calculated, as usual, as the percentage change from the reference price (\$132.00) to the closing price (\$149.01) of the first day of trading, resulting in an underpricing of 12.9%. In this sense, it could be right to debate about shares underpricing also in the framework of this specific case, if the phenomenon is simply intended as a measure of the trading price jump over previously set value indications incorporated and reflected in a reference-offering price, that only expresses how much the offered shares have been undervalued during the pre-listing phase. Of course, it is sure that this point could weaken the results of this dissertation and for this reason the following conclusions should be validated by further future analyses on the issue, as more companies will chose to list through this innovative mechanism.

Having clarified that, as it has been assessed in the section dedicated to the valuation of the company, also Spotify shares seem to have been undervalued before their effective listing. As found through the DCF analysis indeed – then corroborated by sensitivity and multiples analyses – the assumed fair value of Spotify’s shares is \$147.74, really close to the first day closing price of the stock, \$149.01, but 11.9% higher than the reference price of \$132.00. This outcome has therefore suggested that also Spotify’s shares, as the majority of IPO shares, have indeed been undervalued by Morgan Stanley when setting the reference price in consultation with the NYSE. The only difference was that Spotify’s shares did not initially trade at that price since they were not underwritten by the investment bank. Therefore, also in the case of this IPO, at least theoretically, it is possible to sustain that company’s shares have been underpriced by 12.9% (since the DCF has resulted in a value per share really similar to the closing price, this last is considered as the real value of Spotify’s shares, as market mechanisms are supposed to be more efficient than the valuation analysis performed in this dissertation is).

During this chapter it has also been studied IPO underpricing of a sample of 26 Internet-related firms which went public through the traditional underwritten process from 2016 to 2018. It has been highlighted that the majority of them was indeed underpriced, and that the degree of that underpricing was decisively higher, in particular for companies that went public during 2018, than the average level reached considering also non-Internet IPOs. As shown in Figure 17, the 11 Internet IPOs conducted during 2018 and considered in the sample exhibited in fact a mean initial return of 46.5%, more than twice the mean underpricing level calculated on the basis of all the IPOs undertaken in 2018 (18.6%). In this context, Spotify’s underpricing (12.88%) appears as an exception: not only the company’s shares were less underpriced than the other Internet-related IPOs of the same year, but they were also significantly less underpriced than the average underpricing of all the 2018 IPOs. Moreover, also taking into account only the largest technology companies of the sample like those displayed in Figure 18, Spotify remained among the firms presenting the lowest level of underpricing (only Presidio exhibited a smaller initial return, equal to 1.8%). The final paragraph of the section dedicated to the contemporary Internet-related IPOs analysis then compared Spotify’s initial return with underpricing levels of the most comparable firms within the sample: Dropbox, Roku and Snap; although presenting similar features to Spotify’s ones – in terms of market capitalization, offered services and age at the time of listing – their underpricing (35.6%, 67.9% and 44.0%, respectively) was consistently higher than Spotify’s one.

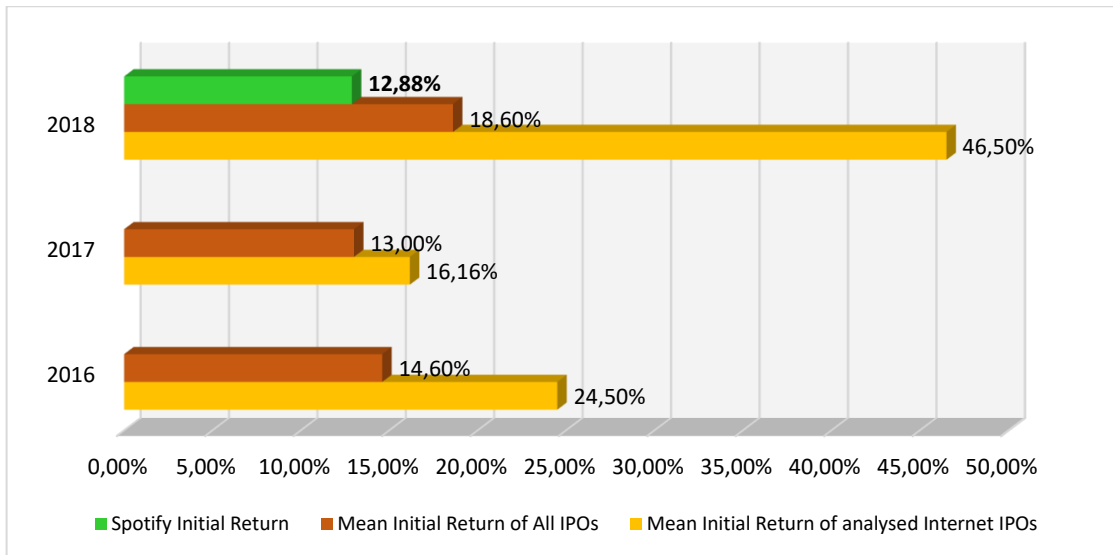


Figure 17: Yearly Mean Initial Return of the sample, of all IPOs and of Spotify in the period 2016-2018 (source: own illustration based on sample data and on Ritter's data available on https://site.warrington.ufl.edu/ritter/files/2019/03/IPOs2018_Underpricing.pdf)

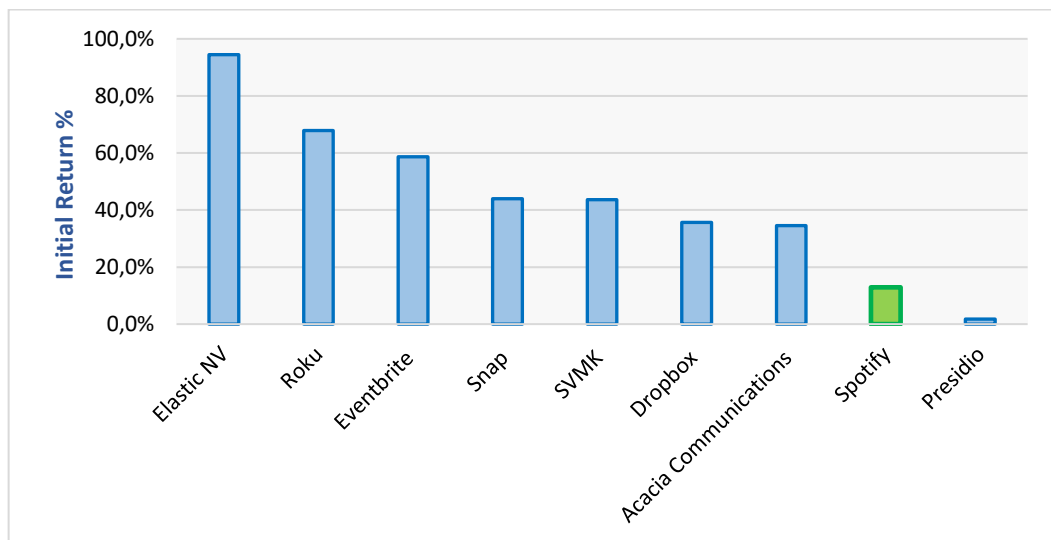


Figure 18: Initial Return of some of the most important Internet-related IPOs of the period 2016-2018, compared with Spotify's (source: own illustration based on sample data)

Therefore, the whole analysis performed in this chapter suggests two primary conclusions: the first is that also Spotify's shares have been somehow underpriced in the pre-listing phase, and the second is that this positive first-day initial return is however much lower than the average underpricing of contemporary technology IPOs. At this point, the question could therefore be: which could be the reasons behind the lower underpricing level of the company? A first explanation could rely in the greater size of Spotify with respect to the other firms of the sample in terms of revenue; this characteristic, associated with the fact that a firm with higher revenue is also supposed to have a well-established market share, could make the company more

trustworthy than smaller and younger companies. However also looking at the largest technology IPOs undertaken after 2000, initial returns remain elevated⁴⁰: just to cite the most relevant, LinkedIn IPO (2011) initial return was 109.4%, Twitter IPO one (2013) was 72.7%, Groupon IPO one (2011) was 30.6% and Google auction one (2004) was 18.04%. The cause of Spotify's lower level of underpricing must therefore be found in the way the company's shares offering took place and, especially, in the procedure according to which the reference-offering price has been determined. Chapter 3 reported some of the main empirical studies about IPO underpricing linked to the role of investment banks. In particular, one section was dedicated to the evidences related to principal-agent asymmetries, in which Chen, Fok and Kang (2009) demonstrated that self-marketed IPOs – that is, investment banks' IPOs underwritten by the same investment banks – were less underpriced than non-self-marketed IPOs. In another section, dedicated to the test of Benveniste and Spindt theory (1989), Jenkinson and Jones (2004), Aggarwal, Prabhala and Puri (2002), Ljungqvist and Wilhelm (2002) partly concluded that positive first-day return is largely discretionary used by underwriters more in order to favour their own main relevant clients than to effectively gain information about the real value of issued shares. Finally in the section dealing with the relation between shares underpricing and price-setting mechanisms all the considered authors – Derrien and Womack (2003), Kaneko and Pettway (2003), Lowry, Officer and Schwert (2010) – highlighted that shares offered through auction IPOs were systematically less underpriced than shares offered through the bookbuilding mechanism. Following these evidences, Spotify's lower degree of underpricing could be due first, to the absence of investment banks in the role of underwriters – thus neutralizing information asymmetry problems between bank and listing firm and deleting investment bank's interests in favouring its own clients – and then to the fairer mechanism through which the reference price has been determined. Spotify's experience could therefore be assumed as one more proof about bookbuilding approach inadequacy in determining IPOs offering prices. While Derrien and Womack (2003), Kaneko and Pettway (2003), and Lowry, Officer and Schwert (2010) studies underlined that listing companies could save more money if opting for an offering price determined on the basis of an auction mechanism rather than of an orders' book collected by underwriters, Spotify's direct public offering suggests an alternative way in which offering price could be set also in traditional underwritten IPOs: by referring, if existing, to recent private market equity transactions.

⁴⁰ Of course, this comparison is highly imprecise since Spotify's DPO and these IPOs happened in very different times.

However, another allowed question would be the following one: why did Spotify's financial advisor, Morgan Stanley, and stock market, the NYSE's staff, decide to underprice Spotify's shares as well? They could have simply set the reference price equal to the estimated fundamental per share value of the company's equity (for example, taking that deriving from this DCF analysis, at \$147.7) and the resulting first-day initial return would have been very close to zero. In traditional underwritten IPOs it rarely happens since, at least part of the underpricing level, benefits investment bankers and its clients; but in a DPO, where investment banks have no possibility to favour their own interests' and institutional investors ones, there would be no rational to, even if ideally, underprice offered shares. One explanation to this issue could be found in Anand's theory (2003): as described in Chapter 2, Anand sustained that a certain degree of underpricing is required also in direct offerings, in order to be able to compete with traditional underpriced IPOs. Spotify's offering could in a first instance be set at discount so to make it desirable to prospect investors: even though investors who bought Spotify's shares did not record any tangible capital gain with respect to the reference price, they could have been persuaded by the idea of investing in a stock whose fundamental value ranged from \$138 to \$152 (expanding the DCF analysis at the results obtained through the "optimistic" and the "pessimistic" scenarios) but that was initially "offered" only at \$132⁴¹.

After having tried to carefully interpret the various reasons behind some crucial aspects of Spotify's direct public offering, two main general suggestions dictated by the first real direct listing case can be summarized as follows. First, provided that the concept of underpricing could be somehow applied also to DPOs, also direct listings will likely be interested by first-day closing price appreciation with respect to reference-offering price: an ideal shares underpricing could indeed realize since investment banks and stock markets, only marginally involved in the process, are interested, for some unclear reasons, in underpricing the offering as well. Second, the eventual positive first-day return of offered shares will probably be lower than that of other IPOs: reference price determination under DPO process will indeed appeal to fairer and more reliable criteria, such as previous price transactions, which better approximate the fundamental value of the stock.

⁴¹ In some sense, this reasoning could be considered as an alternative application of Loughran and Ritter (2002) prospect theory.

CONCLUSION

The starting point of this dissertation, investigating the relation between underpricing and direct listings, has naturally been a thorough study of the theoretical literature about IPO underpricing. This initial research has highlighted that, while the numerous empirical studies conducted in different period of times and in various financial markets have all confirmed the presence, though in different measures, of this phenomenon, theoretical literature has never been, and probably, will never be able to provide a single and exhaustive explanation to IPO underpricing. Completely aware of this, author's interest has however been captured by recent studies focusing on the connection between underpricing and the way in which the listing process is structured in terms of price setting and shares allocation. One particular statement by Ritter and Welch (2002, p.11), reporting that "[...] the solution to the underpricing puzzle has to lie in focusing on the setting of the offer price, where the normal interplay of supply and demand is suppressed by the underwriter", has led to the decision of deepening this aspect of underpricing.

For this reason, part of this dissertation has been dedicated to the review of the most relevant evidences about the topic. Stemming from the perception of a large amount of money left on the table from the Internet bubble forward, these studies have concentrated their attention on the role of underwriters within the listing process. Among others, Chen, Fok and Kang (2009) analysed the issue by examining self-marketed IPOs, that is initial public offerings of banks who participate in the distribution of their own shares, finding that, when investment banks are involved in their own IPO, the expected level of underpricing is lower. Various authors have then faced the point by focusing on investment banks' activities performed along the bookbuilding procedure: Ljungqvist and Wilhelm (2002), Aggarwal, Prabhala and Puri (2002), and Jenkinson and Jones (2004) have demonstrated that investment banks' discretion in allocating shares among investors is often aimed more at favouring regular important clients than at setting more informative offering prices. Finally, Derrien and Womack (2003), Kaneko and Pettway (2003) and Lowry, Officer and Schwert (2010) have empirically compared underpricing resulting from bookbuilt IPOs with that of auctions, highlighting that, when underwriters are little involved in the price-setting mechanism, as indeed happens for auctions, underpricing is greatly reduced.

Following these findings, the case of Spotify's direct listing wants to contribute and corroborate these previous empirical evidences by adopting a unique perspective, that of a completely disintermediated listing process indeed. By analysing an initial public offering in which no

investment bank has assumed the role of underwriter and by comparing it with contemporary traditional IPOs, similar to Spotify under many aspects except for the type of offering, the influence of investment banks on underpricing should be easily recognised. Therefore, the aim of this work was first to understand if underpricing could be somehow identified also in this type of listing, and then to compare it with underpricing level reached by traditional IPOs.

The study of the Spotify's direct public offering has shown that the company, materially, did not leave any money on the table in going public. It has been seen that, although three prestigious investment banks (Morgan Stanley, Goldman Sachs, Allen and Co.) have been indeed involved in the issue, they did not underwrite any of the shares offered by Spotify's selling investors. They just limited to determine with the NYSE and with the designated market maker first an initial reference price – set at the level of \$132.00 by looking at Spotify's previous private shares transactions – and then a clearing market price – set at \$165.90 on the base of buy and sell orders received by the DMM – that represents the price at which Spotify's shares began to trade for the first time. Therefore, the decision to list through a direct offering, thus providing for no institutional investors buying company's shares from underwriters at the offering price and reselling them soon after at higher prices, has allowed Spotify to save millions of dollars in terms of indirect costs of listing. However, from a pure theoretical point of view, all the elements necessary to ideally compute shares first-day return exist also in Spotify's direct listing. Since also in this case a sort of offering price has been determined, as required by NYSE ad hoc Rule 15 which substitutes the term “offering price” with that of “reference price” for direct public offerings, stocks initial return can be calculated, as usual, as the percentage change from the reference price (\$132.00) to the closing price (\$149.01) of the first day of trading, resulting in an underpricing of 12.9%.

It has been explained that this artificial initial return can assume a double meaning. First, it could be simply intended as a measure of how much the trading price jumps over previous value indications incorporated and reflected in the reference price; in such case, Spotify's ideal underpricing would only express the extent of shares' undervaluation during the pre-listing phase. Alternatively, it could represent the real loss suffered by the company, if it had chosen to list undertaking a traditional underwritten IPO, in which, however, offering price had been determined using more tangible parameters as private shares transactions prices, than the bookbuilding approach. By adopting this last interpretation, it has become interesting to examine the magnitude of the underpricing phenomenon for contemporary traditional IPOs, whose offering prices were indeed established by taking into account banks' and investors' private interests.

For this purpose, a sample of 26 Internet IPOs listed on the NYSE and NASDAQ between April 2016 and December 2018 has been analysed. It has been first observed that most of the companies (81%) are indeed underpriced and that the mean initial return over the three analysed years is 30.8%. It has also been highlighted that only companies presenting a market capitalization lower than \$1 billion show a mean initial return under the 20%, while all the others are characterized by mean underpricing averaging from 30% to more than 40%. In particular, firms with the greater market capitalization, Snap and Dropbox, have been underpriced by 44.0% and 35.6%, respectively. Finally, distinguishing underpricing for each of the three years, 2018 IPOs exhibit the highest average level of underpricing (46.5%) with respect to 2017 IPOs (16.2%) and 2016 IPOs (24.5%). Moreover, Internet IPOs undertaken in 2018 have been much more underpriced than all other IPOs operated in the same year (the mean initial return for all the 2018 IPOs is indeed 18.6%).

Therefore, the empirical evidences deriving from the analysed sample showed that, at least theoretically, Spotify's underpricing has been more contained than that of contemporary and comparable IPOs. However, in order to assess if the company has indeed been undervalued in the pre-listing phase – that is, if the reference price has been set under the real shares' value – company evaluation using discounted cash flow methodology and multiples analysis has been performed. The fundamental analysis, corroborated by various sensitivity scenarios, has evidenced that the company's value per share at the time of the DPO is \$147.7. As the reference price was set almost 11.9% lower than Spotify's fundamental value, this outcome confirms that the firm has indeed been underpriced in phase of pre-listing valuation. Then, company's initial return of 12.9% results much lower than the level of underpricing of both the comparable Internet IPOs considered in the sample and the whole population of IPOs conducted during 2018, thus proving its exceptional nature.

It has then been hypothesized that, following Anand's theory (2003), Spotify's direct public offering could have been underpriced in order to make it as appealing as other contemporary IPOs for prospective investors: though not gaining any evident direct benefits from Spotify's shares underpricing, Morgan Stanley and the NYSE could have decided to underprice Spotify's shares on purpose so to let them compete with traditional underpriced IPOs. Moreover, it has been assumed that the lower degree of shares underpricing could be attributed to the mechanism by which the reference price was determined. While Derrien and Womack (2003), Kaneko and Pettway (2003), and Lowry, Officer and Schwert (2010) studies underlined that listing companies could save a large amount of money if opting for an offering price determined on the basis of an auction mechanism rather than of an orders' book collected by underwriters,

Spotify's direct public offering suggests another alternative by which offering price could be set also in traditional underwritten IPOs. Indeed, if traditional IPOs provided for a more limited negotiation between investment banks and institutional investors about the offering price and relied instead more on tangible and objective criteria such as private sales prices, as done in the case of Spotify's reference price, underpricing degree would be largely reduced.

Nevertheless, these hypotheses must be carefully weighted, since the analysis does present some limitations. First, the comparable sample has a small size, only including technology and Internet IPOs undertaken on the two main American stock markets in the period 2016-2018; Spotify underpricing could be further compared with large technology IPOs conducted in previous years or with contemporary non-technology IPOs. Second, the whole work questions the conceptual meaning of underpricing, inquiring if such phenomenon can only be defined when investment banks underwrite offered shares, entailing that issuing companies actually leave money on the table, or if it can be defined also in the context of DPOs, whenever the first-day of trading closing price jumps above the offer price, thus conveying market shares appreciation with respect to pre-opening valuations. Since, for what concerns the limited knowledge of this work, the existing literature only provides few and unclear answers about the argument, this concrete case has hopefully underlined an aspect of underpricing before unexplored. As other companies will decide to go public through direct listing, further studies on a greater sample of DPOs could certainly shed light on the issue.

APPENDICES

APPENDIX A

	Note	2015	2016	2017
Revenue	4	1,940	2,952	4,090
Cost of revenue		1,714	2,551	3,241
Gross profit		226	401	849
Research and development		136	207	396
Sales and marketing		219	368	567
General and administrative		106	175	264
Operating loss		(235)	(349)	(378)
Finance income	9	36	152	118
Finance costs	9	(26)	(336)	(974)
Share in (losses)/earnings of associates and joint ventures		—	(2)	1
Finance income/(costs) - net		10	(186)	(855)
Loss before tax		(225)	(535)	(1,233)
Income tax expense	10	5	4	2
Net loss attributable to owners of the parent		(230)	(539)	(1,235)
Net loss per share attributable to owners of the parent				
Basic and diluted	11	(1.62)	(3.63)	(8.14)
Weighted-average ordinary shares outstanding				
Basic and diluted	11	141,946,600	148,368,720	151,668,769
Pro forma net loss per share attributable to owners of the parent (unaudited)				
Basic and diluted	11			(4.28)
Pro forma weighted-average ordinary shares outstanding (unaudited)				
Basic and diluted	11			166,146,849

Table 40: Consolidated Spotify Profit and Loss Statement from 2015 to 2017. Data in millions of € (source: Spotify' Registration Statement, March 2018)

	Note	2016	2016	2017
Assets				
Non-current assets				
Property and equipment	12	81	85	73
Intangible assets including goodwill	13	73	80	162
Investment in associates and joint ventures	25	1	—	1
Long term investment	22	—	—	910
Restricted cash and other non-current assets	14	21	23	54
Deferred tax assets	10	4	3	9
		<u>180</u>	<u>191</u>	<u>1,209</u>
Current assets				
Trade and other receivables	15	244	300	360
Income tax receivable	10	3	6	—
Short term investments	22	—	830	1,032
Cash and cash equivalents	22	597	755	477
Other current assets		27	18	29
		<u>871</u>	<u>1,909</u>	<u>1,898</u>
Total assets		<u>1,051</u>	<u>2,100</u>	<u>3,107</u>
Equity/(Deficit) and liabilities				
Equity/(Deficit)				
Share capital	16	—	—	—
Other paid in capital	16	797	830	2,488
Other reserves	16	85	122	177
Accumulated deficit		(653)	(1,192)	(2,427)
Equity/(Deficit) attributable to owners of the parent		<u>229</u>	<u>(240)</u>	<u>238</u>
Non-current liabilities				
Convertible notes	18, 22	—	1,106	944
Accrued expenses and other liabilities	20	16	10	56
Provisions	21	8	4	6
Deferred tax liabilities	10	—	—	3
		<u>24</u>	<u>1,120</u>	<u>1,009</u>
Current liabilities				
Trade and other payables	19	119	201	341
Income tax payable	10	5	6	9
Deferred revenue	4	92	149	216
Accrued expenses and other liabilities	20	485	673	881
Provisions	21	15	57	59
Derivative liabilities	22	82	134	354
		<u>798</u>	<u>1,220</u>	<u>1,860</u>
Total liabilities		<u>822</u>	<u>2,340</u>	<u>2,869</u>
Total equity/(deficit) and liabilities		<u>1,051</u>	<u>2,100</u>	<u>3,107</u>

Table 41: Consolidated Spotify Balance Sheet Statement from 2015 to 2017. Data in millions of € (source: Spotify' Registration Statement, March 2018)

APPENDIX B

	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue growth	39,0%	38,0%	37,0%	36,0%	35,0%	33,0%	30,0%	25,0%	22,0%	20,0%
COGS/revenue	75,0%	74,0%	73,0%	70,0%	70,0%	68,0%	68,0%	68,0%	68,0%	68,0%
R&D/revenue	10,0%	10,0%	9,5%	9,0%	8,5%	8,0%	8,0%	7,0%	7,0%	7,0%
Sales and Marketing/revenue	14,0%	14,0%	14,0%	13,0%	13,0%	12,0%	11,0%	10,0%	10,0%	10,0%
General and Administrative/revenue	6,5%	6,0%	6,0%	6,0%	5,8%	5,5%	5,3%	5,0%	5,0%	5,0%
Tax Rate	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%	27,0%

Table 42: DCF analysis assumptions (Source: own elaboration)

<i>Data in millions of €</i>	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Trade receivables	467	645	883	1.201	1.622	2.157	2.804	3.505	4.277	5.132
Days in revenues	30	30	30	30	30	30	30	30	30	30
Trade Payables	469	639	785	1.023	1.174	1.517	1.972	2.320	2.831	3.397
% on COGS	11%	11%	10%	10%	8,50%	8,50%	8,50%	8%	8%	8%
Other Current Assets	30	30	31	31	32	33	33	34	35	35
Other Current Liabilities	1.142	1.119	1.096	1.075	1.053	1.032	1.011	991	971	952
Total Working Capital	-1114	-1082	-967	-865	-573	-359	-146	228	509	819
Working Capital Change	3	31	116	102	292	214	213	374	281	309

Table 43: DCF analysis assumptions on working capital change (source: own elaboration)

<i>Data in millions of €</i>	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Property Plant and Equipment	171	196	215	292	335	394	444	512	624	749
% on revenue	3,0%	2,5%	2,0%	2,0%	1,7%	1,5%	1,3%	1,2%	1,2%	1,2%
Depreciation	102	98	86	117	134	157	177	205	250	300
% on PPE	60%	50%	40%	40%	40%	40%	40%	40%	40%	40%
Delta PPE	200	124	105	194	177	216	227	273	362	425
Intangibles (excluding goodwill)	171	235	322	439	592	656	853	1066	1301	1561
% on revenue	3,0%	3,0%	3,0%	3,0%	3,0%	2,5%	2,5%	2,5%	2,5%	2,5%
Amortization	51	71	97	132	178	197	256	320	390	468
% on intangibles	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Delta Intangibles	195	135	184	248	331	261	453	533	625	728
Total CAPEX	395	259	289	442	508	477	680	806	987	1.153

Table 44: DCF analysis assumptions on CAPEX (source: own elaboration)

		Sensitivity 2018E								
		Revenue								
COGS/revenue		33,0%	34,0%	35,0%	36,0%	37,0%	38,0%	39,0%	40,0%	41,0%
	72,0%	142,8	143,8	144,8	145,8	146,8	147,8	148,8	149,8	150,8
	73,0%	142,5	143,5	144,5	145,5	146,5	147,4	148,4	149,4	150,4
	74,0%	142,2	143,2	144,1	145,1	146,1	147,1	148,1	149,1	150,1
	75,0%	141,8	142,8	143,8	144,8	145,8	146,8	147,7	148,7	149,7
	76,0%	141,5	142,5	143,5	144,4	145,4	146,4	147,4	148,4	149,3
	77,0%	141,2	142,1	143,1	144,1	145,1	146,1	147,0	148,0	149,0
	78,0%	140,8	141,8	142,8	143,7	144,7	145,7	146,7	147,7	148,6
	79,0%	140,5	141,5	142,4	143,4	144,4	145,4	146,3	147,3	148,3
	80,0%	140,1	141,1	142,1	143,1	144,0	145,0	146,0	146,9	147,9

Table 45: DCF sensitivity analysis on revenue and COGS growth for 2018 (source: own elaboration)

		Sensitivity 2019E								
		Revenue								
COGS/revenue		32,0%	33,0%	34,0%	35,0%	36,0%	37,0%	38,0%	39,0%	40,0%
	71,0%	142,9	144,0	145,0	146,0	147,0	148,0	149,0	150,1	151,1
	72,0%	142,5	143,5	144,6	145,6	146,6	147,6	148,6	149,6	150,6
	73,0%	142,1	143,1	144,1	145,1	146,2	147,2	148,2	149,2	150,2
	74,0%	141,7	142,7	143,7	144,7	145,7	146,7	147,7	148,7	149,8
	75,0%	141,3	142,3	143,3	144,3	145,3	146,3	147,3	148,3	149,3
	76,0%	140,9	141,9	142,9	143,9	144,9	145,9	146,9	147,9	148,9
	77,0%	140,4	141,4	142,4	143,4	144,4	145,4	146,4	147,4	148,4
	78,0%	140,0	141,0	142,0	143,0	144,0	145,0	146,0	147,0	148,0
	79,0%	139,6	140,6	141,6	142,6	143,6	144,6	145,5	146,5	147,5

Table 46: DCF sensitivity analysis on revenue and COGS growth for 2019 (source: own elaboration)

		Sensitivity 2020E								
		Revenue								
COGS/revenue		31,0%	32,0%	33,0%	34,0%	35,0%	36,0%	37,0%	38,0%	39,0%
	70,0%	143,0	144,1	145,1	146,2	147,2	148,2	149,3	150,3	151,4
	71,0%	142,6	143,6	144,7	145,7	146,7	147,8	148,8	149,9	150,9
	72,0%	142,1	143,1	144,1	145,2	146,2	147,2	148,3	149,3	150,3
	73,0%	141,6	142,6	143,6	144,6	145,7	146,7	147,7	148,8	149,8
	74,0%	141,0	142,1	143,1	144,1	145,1	146,2	147,2	148,2	149,2
	75,0%	140,5	141,5	142,6	143,6	144,6	145,6	146,7	147,7	148,7
	76,0%	140,0	141,0	142,0	143,1	144,1	145,1	146,1	147,1	148,1
	77,0%	139,5	140,5	141,5	142,5	143,5	144,6	145,6	146,6	147,6
	78,0%	139,0	140,0	141,0	142,0	143,0	144,0	145,0	146,0	147,0

Table 47: DCF sensitivity analysis on revenue and COGS growth for 2020 (source: own elaboration)

OPTIMISTIC SCENARIO												
Data in millions of €	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	
Revenue	4.090	5.726	7.959	10.984	14.938	20.166	26.821	34.867	43.584	53.172	63.806	
revenue growth		40%	39%	38%	36%	35%	33%	30%	25%	22%	20%	
COGS	3.241	4.237	5.810	7.908	10.456	14.116	18.238	23.709	29.637	36.157	43.388	
COGS/revenue		74%	73%	72%	70%	70%	68%	68%	68%	68%	68%	
Gross Profit	849	1.489	2.149	3.075	4.481	6.050	8.583	11.157	13.947	17.015	20.418	
Research and Development	396	573	796	1.043	1.344	1.714	2.146	2.789	3.051	3.722	4.466	
Sales and Marketing	567	802	1.114	1.538	1.942	2.622	3.218	3.835	4.358	5.317	6.381	
General and Administrative	264	372	478	659	896	1.170	1.475	1.848	2.179	2.659	3.190	
EBIT	- 378	- 258	- 239	- 165	- 299	- 544	- 1.743	- 2.685	- 4.358	- 5.317	- 6.381	
Operating (adjusted) Taxes		-	-	-	- 81	- 147	- 471	- 725	- 1.177	- 1.436	- 1.723	
NOPLAT	-	- 258	- 239	- 165	- 218	- 397	- 1.273	- 1.960	- 3.182	- 3.882	- 4.658	
Amortization and Depreciation		137	195	203	276	319	402	443	536	654	785	
Operating Working Capital Change		- 41	- 46	- 76	- 93	- 298	- 218	- 218	- 382	- 287	- 316	
Net Capital Expenditures		- 324	- 346	- 370	- 494	- 445	- 661	- 561	- 824	- 1.009	- 1.178	
Operating FCF	-	- 485	- 436	- 407	- 92	- 26	- 795	- 1.624	- 2.512	- 3.240	- 3.949	
discount factor (WACC=10,8%)		0,90	0,81	0,74	0,66	0,60	0,54	0,49	0,44	0,40	0,36	
PV of FCF	-	- 438	- 355	- 299	- 61	- 16	- 430	- 792	- 1.106	- 1.287	- 1.416	

Table 48: DCF analysis, optimistic scenario (Source: own elaboration)

PESSIMISTIC SCENARIO												
Data in millions of €	2017	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	
Revenue	4.090	5.603	7.620	10.288	13.888	18.610	24.752	32.177	40.222	49.070	58.885	
revenue growth		37%	36%	35%	35%	34%	33%	30%	25%	22%	20%	
COGS	3.241	4.259	5.715	7.613	9.722	13.027	16.831	21.881	27.351	33.368	40.041	
COGS/revenue		76%	75%	74%	70%	70%	68%	68%	68%	68%	68%	
Gross Profit	849	1.345	1.905	2.675	4.167	5.583	7.921	10.297	12.871	15.703	18.843	
Research and Development	396	560	762	977	1.250	1.582	1.980	2.574	2.816	3.435	4.122	
Sales and Marketing	567	784	1.067	1.440	1.805	2.419	2.970	3.540	4.022	4.907	5.888	
General and Administrative	264	364	457	617	833	1.079	1.361	1.705	2.011	2.454	2.944	
EBIT	- 378	- 364	- 381	- 360	278	502	1.609	2.478	4.022	4.907	5.888	
Operating (adjusted) Taxes		-	-	-	75	136	434	669	1.086	1.325	1.590	
NOPLAT		- 364	- 381	- 360	203	367	1.174	1.809	2.936	3.582	4.299	
Amortization and Depreciation		134	187	190	257	294	371	409	495	604	724	
Operating Working Capital Change		- 28	- 40	- 68	- 108	- 275	- 203	- 202	- 354	- 266	- 293	
Net Capital Expenditures		- 315	- 326	- 337	- 455	- 405	- 610	- 518	- 760	- 931	- 1.087	
Operating FCF		- 572	- 560	- 575	- 103	- 19	732	1.497	2.317	2.988	3.643	
discount factor (WACC=10,8%)		0,90	0,81	0,74	0,66	0,60	0,54	0,49	0,44	0,40	0,36	
PV of FCF		- 516	- 456	- 422	- 68	- 11	396	730	1.020	1.187	1.306	

Table 49: DCF analysis, pessimistic scenario (Source: own elaboration)

APPENDIX C

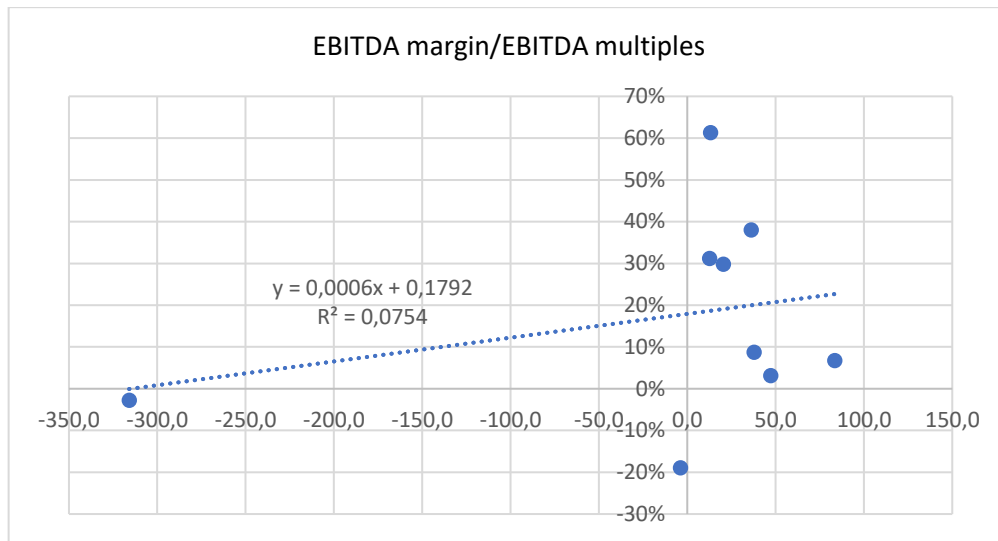


Figure 19: regression chart of EBITDA margin over EBITDA multiples (source: own illustration based on sample data)

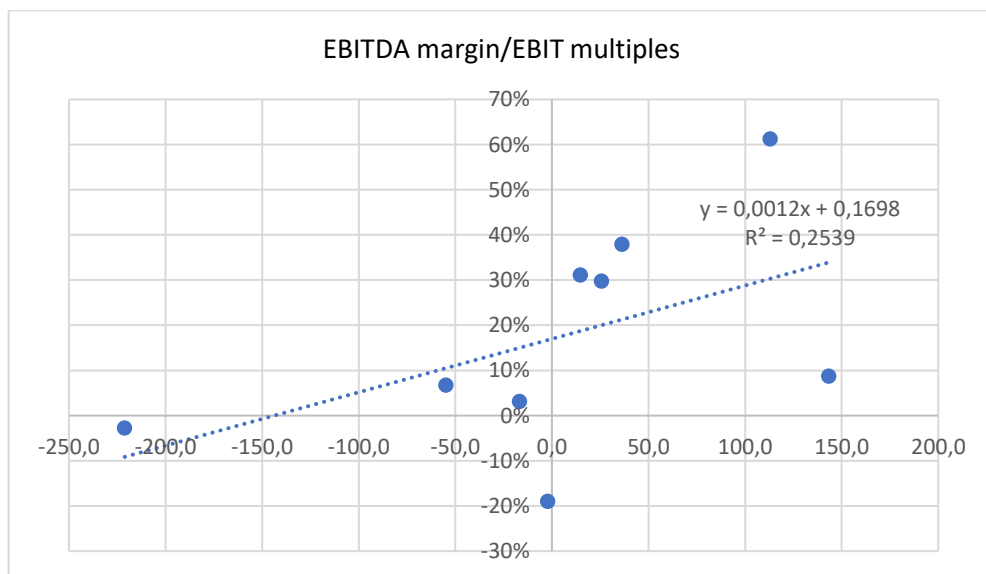


Figure 20: regression chart of EBITDA margin over EBIT multiples (source: own illustration based on sample data)

REFERENCES

- AGGARWAL, R., 2000. Stabilization Activities by Underwriters after Initial Public Offerings. *The Journal of Finance*, 55(3), 1075-1103.
- AGGARWAL, R., KRIGMAN, L. and WOMACK, K., 2002. Strategic IPO Underpricing, Information Momentum, and Lockup Expiration Selling. *Journal of Financial Economics*, vol.66, 105–137.
- AGGARWAL, R., PRABHALA, N.R. and PURI, M., 2002. Institutional Allocation in Initial Public Offerings: Empirical Evidence. *The Journal of Finance*, 57(3), 1421-1442.
- AKERLOF, G.A., 1970. The Market for "Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*; 84(3), 488-500.
- ALLEN, F. and FAULHABER, G.R., 1989. Signalling by Underpricing in the IPO Market. *Journal of Financial Economics*, 23(2), 303-323.
- AN, H. and CHAN, K., 2008. Credit Ratings and IPO Pricing, *Journal of Corporate Finance*, vol.14, 584–595.
- ANAND, A.I., 2003. The Efficiency of Direct Public Offerings. *Journal of Small & Emerging Business Law*, vol.7, 433-466.
- AROSIO, R., GIUDICI, G. and PALEARI, S., 2000. Why Do (or Did?) Internet-Stock IPOs Leave So Much "Money on The Table"? *Australasian Finance and Banking Conference*.
- BAGLEY, C.E. and DAUCHY, C.E., 2012. *The Entrepreneur's guide to Business Law*. Fourth ed. South-Western.
- BARON, D.P., 1982. A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues. *The Journal of Finance*, 37(4), 955-976.
- BARON, D.P. and HOLMSTRÖM, B., 1980, The Investment Banking Contract for New Issues under Asymmetric Information: Delegation and the Incentive Problem. *Journal of Finance*, vol.35, 1115-1138.

- BEATTY, R.P. and RITTER, J.R., 1986. Investment Banking, Reputation and the Underpricing of Initial Public Offerings. *Journal of Financial Economics*, 15(1), 213-232.
- BECKMAN, J. et al., 2001. The influence of underwriter reputation, keiretsu affiliation, and financial health on the underpricing of Japanese IPOs. *Pacific-Basin Finance Journal*, vol.9, 513-534.
- BENVENISTE, L.M., BUSABA W.Y. and WILHELM, W.J., 2002. Information Externalities and the Role of Underwriters in Primary Equity Markets, *Journal of Financial Intermediation*, vol.11, 61-86.
- BENVENISTE, L.M., BUSABA, W.Y. and WILHELM, W.J., 1996, Price Stabilization as a Bonding Mechanism in New Equity Issues, *Journal of Financial Economics*, vol.42, 223-255.
- BENVENISTE, L.M. and SPINDT, P.A., 1989. How Investment Bankers Determine the Offer Price and Allocation of New Issues. *Journal of Financial Economics*, 24(2), 343-361.
- BENVENISTE, L.M. and WILHELM, W.J., 1990. A Comparative Analysis of IPO Proceeds Under Alternative Regulatory Environments. *Journal of Financial Economics*, 28(1), 173-207.
- BENVENISTE, L.M. et al., 2003, Evidence of Information Spillovers in the Production of Investment Banking Services, *Journal of Finance*, vol.58, 577- 608.
- BIAIS, B. and FAUGERON, A.M., 2002. IPO auctions: English, Dutch, French and Internet. *Journal of Financial Intermediation*, vol.11, 9-36.
- BLACK, B.S., 1998, Information Asymmetry, the Internet, and Securities Offerings. *Journal of Small and Emerging Business Law*, 2(1), 91-100.
- BOOTH, J.R. and CHUA, L., 1996. Ownership Dispersion, Costly Information, and IPO Underpricing. *Journal of Financial Economics*, 41(2), 291-310.
- BOOTH, J.R., and SMITH, R., 1986, Capital Raising, Underwriting and the Certification Hypothesis, *Journal of Financial Economics*, vol.15, 261-281.
- BRENNAN, M.J. and FRANKS, J., 1997. Underpricing, Ownership and Control in Initial Public Offerings of Equity Securities in the UK. *Journal of Financial Economics*, 45(3), 391-413.

- CARTER, R.B. and MANASTER, S., 1990. Initial Public Offerings and Underwriter Reputation. *Journal of Finance*, vol.45, 1045-1067.
- CHEN, H., FOK, R.C.W., and KANG, S., 2009. Issuers' Incentives and Tests of Baron's Model of IPO Underpricing. *Review of Quantitative Finance and Accounting*, vol.35, 71-87.
- COFFEE, J.C., 2018. The Spotify Listing: Can an "Underwriter-less" IPO Attract Other Unicorns? [online]. *The CLS Blue Sky Blog* available at <<http://clsbluesky.law.columbia.edu/2018/01/16/the-spotify-listing-can-an-underwriter-less-ipo-attract-other-unicorns/>> [access date: 13/08/2019].
- CORNELLI, F. and GOLDREICH, D., 2001. Bookbuilding and Strategic Allocation. *The Journal of Finance*, 56(6), 2337-2369.
- CORWIN, S.A. and SHULTZ, P., The Role of IPO Underwriting Syndicates: Pricing, Information Production, and Underwriter Competition. *The Journal of Finance*, 60(1), 443-486.
- DERRIEN, F. and WOMACK, K.L., 2003. Auctions vs. Book Building and the Control of Underpricing in Hot IPO Markets, *The Review of Financial Studies*, 16 (1), 31-61.
- DOLVIN, S.D., 2012. IPO Underpricing: The Owners' Perspective. *Journal of Economics and Finance Education*, 11(2), 63-69.
- DOLVIN, S.D. and JORDAN, B.D., 2008. Underpricing, Overhang, and the Cost of Going Public to Preexisting Shareholders. *Journal of Business Finance and Accounting*, 35(3-4), 434-458.
- DRAHO, J., 2004. *The IPO Decision: Why and How Companies Go Public*. Cheltenham: Edward Elgar Publishing.
- DUCHARME, L.L., RAJGOPAL, S. and SEFCIK, F.E., 2001. Why was Internet IPO Underpricing so Severe? [working paper]. University of Washington.
- DUNBAR, C.G., 2000. Factors Affecting Investment Bank Initial Public Offering Market Share. *Journal of Financial Economics*, vol.55, 3-41.
- ESPINASSE, P., 2014. *IPO: A Global Guide* (Expanded Second Edition). Second ed. Hong Kong: Hong Kong University Press.

- FARRELL, M., OSIPOVICH, A. and STEELE, A., 2018. Spotify's Splashy Debut Pressures Banks [online]. *Wall Street Journal*, available at <<https://www.wsj.com/articles/spotify-shares-jump-in-market-debut-1522773951>> [access date: 13/08/2019].
- FERNANDO, C.S., GATCHEV, V.A. and SPINDT, P.A., 2005. Wanna Dance? How firms and Underwriters Choose Each Other. *The Journal of Finance*, 60(5), 2437-2469.
- FIELD, L.C. and KARPOFF, J.M., 2002, Takeover Defenses at IPO Firms, *Journal of Finance*, vol.57, 1857-1889.
- FISCH, J.E., 1998. Can Internet Offerings Bridge the Small Business Capital Barrier? *Journal of Small & Emerging Business Law*, 57(75).
- FUNG, S.Y.K., GUL, F.A. and RADHAKRISHNAN, S., 2014. Investment Banks' Entry into New IPO Markets and IPO Underpricing. *Management Science*, 60(5), 1297–1316.
- GEDDES, R., 2003. *IPOs and Equity Offerings*. First ed. GB: Butterworth Heinemann.
- GHOSH, S., 2005. Underpricing of Initial Public Offerings. *Emerging Markets Finance and Trade*, vol.41, 45-57.
- GIDDINGS, D.E., 1998. An Innovative Link between the Internet, the Capital Markets, and the SEC: How the Internet Direct Public Offering Helps Small Companies Looking to Raise Capital. *Pepperdine Law Review*, 25, 785-817.
- GREGORIOU, G.N., 2006. *Initial public offerings*. First ed. Amsterdam: Butterworth-Heinemann.
- GRINBLATT, M. and HWANG, C.Y., 1989. Signalling and The Pricing of New Issues. *The Journal of Finance*, 44(2), 393-420.
- HANLEY, K.W., 1993. The Underpricing of Initial Public Offerings and the Partial Adjustment Phenomenon. *Journal of Financial Economics*, 34(2), 231-250.
- HANLEY, K.W. and WILHELM, W.J., 1995. Evidence on the Strategic Allocation of Initial Public Offerings. *Journal of Financial Economics*, 37(2), 239-257.
- HANNON, K., 1996. Going Public to the Public; Small Businesses Can Bypass Underwriters and Save Big Money. *U.S. News and World Report*, 120(19), p.74.

- HEIM, R.G., 2002. *Going Public in Good Times and Bad: A Legal and Business Guide*. First ed. New York: ALM Publishing.
- HUGHES, P.J. and THAKOR, A.V., 1992. Litigation Risk, Intermediation, and the Underpricing of Initial Public Offerings. *The Review of Financial Studies*, 5(4), 709-742.
- IANNOTTA, G., 2010. *Investment banking. A guide to Underwriting and Advisory Services*. Heidelberg: Springer.
- IBBOTSON, R.G., 1975. Price Performance of Common Stock New Issues. *Journal of Financial Economics*, 2(3), 235-272.
- JAMES, C. and WIER, P., 1990. Borrowing Relationships, Intermediation, and the Cost of Issuing Public Securities. *Journal of Financial Economics*, 28(1), 149-171.
- JENKINSON, T. and LJUNGQVIST, A., 2001. *Going public: The Theory and Evidence on how Companies Raise Equity Finance*. Second ed. Oxford: Oxford Univ. Press.
- JENKINSON, T. and JONES, H., 2004. Bids and Allocations in European IPO Bookbuilding. *The Journal of Finance*, 59(6), 2309-2338.
- KANEKO, T. and PETTWAY, R.H., 2003. Auctions versus Book Building of Japanese IPOs. *Pacific-Basin Finance Journal*, vol.11, 439-462.
- KATTI, S. and PHANI, B.V., 2016. Underpricing of Initial Public Offerings: A Literature Review. *Universal Journal of Accounting and Finance*, 4(2), 35-52.
- KECSKÉS, A., 2018. Spotify's Direct Listing in the U.S. and Lessons from the UK [online]. *The CLS Blue Sky Blog*, available at <<http://clsbluesky.law.columbia.edu/2018/03/01/spotify-direct-listing-in-the-u-s-and-lessons-from-the-uk/>> [access date: 13/08/2019].
- KUHN, R., 1990. *Investment Banking: The Art and Science of High-Stakes Dealmaking*. New York: Harper & Row, Ballinger Division.
- LEE, P. M. and WAHAL, S., 2004. Grandstanding, Certification and the Underpricing of Venture Capital backed IPOs. *Journal of Financial Economics*, vol.73, 375-407.
- LJUNGQVIST, A., JENKINSON, T.P. and WILHELM, W.J., 2003. Global Integration in Primary Equity Markets: The Role of U.S. Banks and U.S. Investors. *Review of Financial Studies*, vol.16, 63-99.

- LJUNGQVIST, A., NANDA, V. and SINGH, R., 2006. Hot Markets, Investor Sentiment, and IPO Pricing, *Journal of Business*, 79(4), 1667-1702.
- LJUNGQVIST, A.P. and WILHELM, W.J., 2002. IPO Allocations: Discriminatory or Discretionary? *Journal of Financial Economics*, 65(2), 167-201.
- LOGUE, D.E., 1973. On the Pricing of Unseasoned Equity Issues: 1965–1969. *Journal of Financial and Quantitative Analysis*, 8(1), 91-103.
- LOUGHRAN, T. and RITTER, J.R., 2004. Why Has IPO Underpricing Changed Over Time? *Financial Management*, 33(3), 5-37.
- LOUGHRAN, T. and RITTER, J.R., 2002. Why Don't Issuers Get Upset about Leaving Money on the Table in IPOs? *The Review of Financial Studies*, 15(2), 413-443.
- LOWRY, M., OFFICER, M.S. and SCHWERT, G.W., 2010. The Variability of IPO Initial Returns. *The Journal of Finance*, 65(2), 425-465.
- LOWRY, M. and SCHWERT, G.W., 2002. IPO Market Cycles: Bubbles or Sequential Learning? *The Journal of Finance*, 57(3), 1171-1200.
- LOWRY, M. and SHU, S., 2002. Litigation Risk and IPO Underpricing. *Journal of Financial Economics*, 65(3), 309-335.
- MARISSETTY, V. B. and SUBRAHMANYAM, M. G., 2010. Group affiliation and the performance of IPOs in the Indian stock market. *Journal of Financial Markets*, vol.13, 196-223.
- MCGURK, J., 2019. All About Direct Listings [online]. Available on Andreessen Horowitz website at <<https://a16z.com/2019/07/02/direct-listings/>> [access: 15/06/2019].
- MEGGINSON, W. and WEISS, K., 1991, Venture Capitalist Certification in Initial Public Offerings. *Journal of Finance*, vol.46, 879-903.
- MUSCARELLA, C.J. and VETSUYPENS, M.R., 1989. A Simple Test of Baron's Model of IPO Underpricing. *Journal of Financial Economics*, 24(1), 125-135.
- NYSE Information Memo, 2018 [online]. Available on the NYSE website <<https://www.nyse.com/index>> [access date: 22/07/2019].

NYSE IPO Guide, Second Edition, 2013. Available online on the NYSE website at https://www.nyse.com/publicdocs/nyse/listing/nyse_ipo_guide.pdf [access: 24/05/2019].

OSIPOVICH, A. and FARRELL, M., 2018. How Spotify's Unusual First Day of Trading is Expected to Play Out [online]. *The Australian*, available at <https://www.wsj.com/articles/how-spotifys-unusual-first-day-of-trading-will-play-out-1522587600> [access date: 13/08/2019].

PAZARZI, G., 2014. Critical Review of the Literature Regarding IPO Underpricing. *International Journal of Economic Research*, 11(2), 277-289.

REGALLI, M., 2013. Underpricing of Bank IPO's in Intermediary-Oriented Marketplaces: a Test of Baron's Model on the Italian Market. *Academy of Banking Studies Journal*, 12(1), 15-30.

RITTER, J.R., 2018. Initial Public Offerings: Underpricing [online]. Available on Professor Ritter website https://site.warrington.ufl.edu/ritter/files/2019/03/IPOs2018_Underpricing.pdf [access: 15/06/2019].

RITTER, J.R., 1991. The Long-Run Performance of Initial Public Offerings. *The Journal of Finance*, 46(1), 3-27.

RITTER, J.R., 1984. The 'Hot Issue' Market of 1980. *The Journal of Business*, 57(2), 215- 239.

RITTER, J.R. and WELCH, I. 2002. A Review of IPO Activity, Pricing, and Allocations. *The Journal of Finance*, 57(4), 1795-1828.

RITTER, J.R. and ZHANG, D., 2006. Affiliated Mutual Funds and The Allocation of Initial Public Offerings. *Journal of Financial Economics*, vol.86, 337–368.

ROCK, K., 1986. Why New Issues Are Underpriced. *Journal of Financial Economics*, 15(1), 187-212.

RUUD, J.S., 1993, Underwriter Price Support and the IPO Underpricing Puzzle, *Journal of Financial Economics*, vol.34, 135-151.

RYDQVIST, K., 1997, IPO Underpricing as Tax-Efficient Compensation, *Journal of Banking and Finance*, vol.21, 295–313.

SCHULTZ, P., 2003. Pseudo Market Timing and the Long-Run Underperformance of IPOs. *Journal of Finance*, vol.68, 483-517.

SHERMAN, A.E. and TITMAN, S., 2002. Building the IPO Order Book. *Journal of financial economics*, 65(1), 3-29.

SINDELAR, J.L., RITTER, J.R. and IBBOTSON, R.G., 1994. The Market's Problems with The Pricing of Initial Public Offerings. *Journal of Applied Corporate Finance*, 7(1), 66-74.

SJOSTROM, W.K., 2001. Going Public through an Internet Direct Public Offering: A Sensible Alternative for Small Companies. *Florida Law Review*, 53, 529-594.

SPOTIFY TECHNOLOGY SA, 2018. Form F-1 Registration Statement [online]. Available on the company's website at <<https://investors.spotify.com/financials/default.aspx#module-filings>> [access date: 05/05/2019].

STOUGHTON, N.M. and ZECHNER, J., 1998. IPO-Mechanisms, Monitoring and Ownership Structure. *Journal of Financial Economics*, 49(1), 45-77.

TARANTO, M., 2003, Employee Stock Options and the Underpricing of Initial Public Offerings [working paper], University of Pennsylvania.

TINIC, S.M., 1988. Anatomy of Initial Public Offerings of Common Stock. *The Journal of Finance*, 43(4), 789-822.

TITMAN, S., and TRUEMAN, B., 1986, Information Quality and the Valuation of New Issues. *Journal of Accounting and Economics*, vol.8, 159-172.

VALSANIA, M., 2018. La Quotazione Diretta Spaventa le Banche d'Affari [online]. *Il Sole 24 ore*.

VALSANIA, M., 2018. Risultati Spotify sotto le Attese, vendite in borsa. *Il Sole 24 ore*.

VALSANIA, M., 2018. Spotify Supera la Tempesta Hi-Tech. *Il Sole 24 ore*.

WELCH, I., 1992. Sequential Sales, Learning, and Cascades. *The Journal of Finance*, 47(2), 695-732.

WELCH, I., 1989. Seasoned Offerings, Imitation Costs, And the Underpricing Of Initial Public Offering. *The Journal of Finance*, 44(2), 421-449.

ZINGALES, L., 1995. Insider Ownership and the Decision to Go Public. *The Review of Economic Studies*, 62(212), 425-448.