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IPO UNDERPRICING AND TECH IPOs: UBER CASE

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INTRODUCTION

Going public is certainly one of the most important decision in a firm's life. It's a process in which the owners of a business sell shares of the company to public investors who in turn can then trade the shares with other investors on exchanges. There are many reasons why a company wants to go public. Clearly, the most important reason is to raise liquidity for different objectives: investments in R&D, new technologies, hire high-skilled employees or even if they don't want to increase the debt structure. It's also a good opportunity for owners to sell a part of their ownership and being finally repaid after they have contributed with a considerable amount of resources in the activity.

However, the process of becoming public is not free of costs, both direct and indirect. Public companies are required to disclose information on a regular basis increasingly the number of people having access to the company's financial data and then they have to bear the fact that they are constantly judged by the market. Furthermore, investment banks charge between 2-7% the total proceeds as costs for helping the company to go public.

However, the IPO process is not easy: Firstly the company has to hire an investment bank who helps the company to raise capital and ensure it to get as much value as possible from the share issuance. The second step requires a company to file a registration statement with the SEC. The registration statement is an important document because it requires the most important information about the situation of a firm like company's operations, financial situation and management. The SEC will then investigate those disclosure to ensure that they are accurate and if the conditions to go public exist. After that, the company works together with the investment banks to generate interest among the IPO through potential investors. After marketing the business the company allows interested investors to submit indications of interest letting the company know how many shares they want to buy. Once the company has an idea on how much the investors are going to pay for the stock, they set the IPO price and they finalize the IPO allocation.

A wide empirical literature documents that when companies go public, the price of their shares tend to jump significantly on the first day of trading. This systematic price increase from the offer price is defined as underpricing. Clearly, this is a cost because if the shares had been sold at the closing price rather than the offer price, the proceeds of the offering would have been higher, or the same proceeds could have been raised by selling fewer shares. In practice, underpricing results in a sort of wealth transfer from the pocket of the issuing firm

and its pre-issue shareholders to IPO investors and it's also commonly known as "leaving money on the table". The first paper regarding the IPO underpricing was given by Reilly and Hatfield in 1969 which found a 20,2% of underpricing for DJIA stocks ¹over a sample period from 1963-1966. After them, Reilly, Ibbotson, Ritter, Welch and others documented significant relationship between IPOs and underpricing. Despite most studies have described and analysed underpricing in the US stock market, and even though the level of underpricing varies from country to country and from sector to sector, the presence of this phenomenon has been confirmed also in every other market analysed.

There is not only one single theory able to give an exhaustive explanation of the phenomenon. In the past, researchers built different models trying to understand IPO underpricing and the characteristics that influence the first day return. These theories can be classified among 5 categories: asymmetric information theory, institutional theory, ownership and control theory, behavioural theory and prospect and mental accounting theory. The best-known model regarding the asymmetric information theories is the Winner's Curse model presented by Rock (1986). He classified investors in two categories: informed and uninformed. According to the model, the issuing firm has to underprice the shares to reward the ex-ante uncertainty of uninformed investors otherwise they wouldn't invest in the company leading to an IPO failure. In fact, it has been found that ex-ante uncertainty about the firm's value is related to the level of underpricing (Beatty and Ritter 1986).

Institutional theories appeared in the literature for the first time with Logue (1973) and Ibbotson (1975) stating that underpricing is voluntarily planned by issuers because they want to avoid the likelihood of future lawsuit from shareholders unsatisfied from the post-IPO performance of their shares.

Ownership and control theories regard intentions of the management to allocate shares carefully when taking their company public and protect their private benefits. Indeed, underpricing here is seen as a tool to generate excess demand and allow the management to allocate shares to selected investors. In particular, Brennan and Frank (1997) analysing a sample of 69 U.K IPOs between 1986 and 1989 found that large bids are discriminated in favour of small ones and the more underpriced the more oversubscribed the IPO is. Zingales (1995) instead, affirm that shareholders' dispersion increases the bargaining power when managers tries to sell the controlling stake and increase its price. For instance, Pagano,

¹ The Dow Jones Industrial Average (DJIA) is a stock market index that measures the stock performance of 30 large companies listed on stock exchanges in the United States.

Panetta and Zingales (1998) show that most Italian IPOs are followed by private sales of controlling block to large outside investors.

Behavioural theories relate to the irrational behaviour of individual investors. Welch (1992) explained underpricing with the “information cascades” theory. Regardless their own information, later investors condition their bids on the bids of earlier investors. Successful initial IPOs are then interpreted by subsequent investors as proof that earlier investors held better information encouraging them to invest notwithstanding their own information.

Clearly, the role of early investors is determinant in the success or the failure of an offering. Early investors have then a bargain power and can demand more underpricing in return for committing to the IPO and start a positive cascade.

Loughran and Ritter (2002) try to explain underpricing in a way called prospect theory. Investigating why issuers are not afraid to leave money on the table at the IPO, they found that the reason is the limited rationality of the mental accounting process that issuers adopt in recognizing gains and losses. The change in wealth issuers are subjected when they leave money on the table is in part compensated from the appreciation of the shares they retained and haven't sold in the IPO. Surely, the net wealth depends on the number of shares sold and retained at the IPO. Loughran and Ritter (2002) then argue that issuers fail to get upset about leaving millions of dollars ‘on the table’ in the form of large first-day returns because they tend to sum the wealth loss due to underpricing with the wealth gain on retained shares as prices jump in the after-market even if they may not end-up with the best outcome they could have achieved.

Some of the most important and largest IPOs occurred in the last years are technology IPOs. The definition of tech stocks given by Ritter helps to distinguish which companies are included in the sample. He defines them as “internet-related stocks plus other technology stocks, not including biotech”.

Among them, the most important and relevant are the following: Google (2004), Facebook (2012), Twitter and Groupon (2013), Alibaba (2014), Snapchat (2017), Uber and Lyft (2019). Most of the existing literature has always appointed its attention on the period before the bubble and a lot of studies have been made trying to have a better understanding on the behaviour of tech IPOs. In the past, some of the most important authors like Loughran and Ritter (2002), Lowry and Schwert (2002), Giudici and Rosenboom (2002) demonstrated that tech and Internet IPOs are more underpriced than non-tech and non-internet IPOs. With my work, I want to investigate why Uber, which is seen as tech company, has experienced

overpricing in its IPO, why the stocks performed badly after the listing and what might have been influenced the process of valuation of the company.

For these reasons, to better understand the environment in which the company is included I perform an empirical analysis on 2019 US IPOs and in particular on tech IPOs. I've used several variable including IPO first-day return, firms' market capitalization, age of issuing companies and offer price to describe the principal characteristics of IPOs in the sample and to underline the relationships between those variables and the level of initial returns. Being the US market the principal source of revenues of Uber, the NASDAQ-100 and the S&P 500 are used as a proxy of the US market and tech market. NASDAQ is the favourite market for high tech companies and NYSE is the biggest stock market in the world in terms of market capitalization of the companies.

I've decided to analyse this company because the market have never had before the opportunity to trade shares of companies operating into the ride-hailing sector. For the first time, in 2019 Lyft and Uber, which make most of their revenues from the ride-hailing sector, listed their shares on the public market after months of high hype and attention paid by analysts.

This thesis is organized as follows: Chapter 1 presents a review of IPOs, the benefits and the costs of going public, the participants involved and the steps of the IPO process. Chapter 2 provides the literature review of underpricing phenomenon, the main theories that tried in the past to explain the phenomenon and how it varies across countries and time periods. Chapter 3 exhibits the empirical research performed on IPOs, in particular on 2019 tech IPOs. After the description of the variables included in the research and the data sources, the chapter presents the results obtained in comparison with the existing literature. Chapter 4 is related to the Uber's IPO case: it starts with a brief description of the sharing economy and the ride-hailing sector in order to understand its business. The economic performances and the risks and challenges related to those activities are then presented. Thereafter two valuations of Uber are presented: a discounted cash flow model and a rider-based valuation, trying to understand the real value of the company and what could have been the main causes of the overpricing. Finally, the conclusion resumes the main results of the thesis and the limitations of the analysis performed.

CHAPTER 1 - GOING PUBLIC

1.1 – THE MEANING OF IPO

An initial public offering (IPO) refers to the process of offering shares of a private corporation to the public in a new stock issuance. The transition from a private to a public company can be an important time for private investors to fully realize gains from their investment as it typically includes share premiums for current private investors. “The initial public offering (IPO) is frequently the largest equity issue a company ever makes” (Zingales, 1995, p. 425).

Going public it’s a worthy objective with many potential benefits, but as it can be an effective means of raising cash for corporate ventures, there are also many risks and disadvantages: in fact it’s a long, complex and time-consuming process. It involves specific procedures and important decisions have to be made.

Firms have to take into consideration that being a public company requires additional regulatory requirement to be disclosed, they are subjected to greater market pressure and much more attention by analysts, investors and authorities. The management control might change as well, and the fees are not negligible. Firms have to choose the stock market, fulfil the listing requirement and to deal with the shareholders. The success of an IPO depends on all these factors together and firms have to be prepared otherwise the IPO might turn into a big failure.

1.2 - THE BENEFITS AND THE COSTS OF GOING PUBLIC

Why companies decide to go public? “Probably the most important reason is cash”. (Iannotta 2010, p. 46). Funds received through stock selling in the market are the primary source of liquidity: on December 11, 2019, the state-owned oil giant Saudi Aramco had its IPO on the Tadawul exchange in Riyadh, the company raised \$25,6 billion which made its IPO the largest in history surpassing the amount raised by Alibaba in 2014 of \$25 billion.

The proceeds from an IPO justify why many companies decide to go public even without looking at the other benefits that listing might give. These proceeds can help the company in several ways such as investing in R&D, hire new employees, acquire new technologies or other companies in order to pursue their objectives and plans without increasing the debt structure.

There are also “non-cash” reason for an IPO, one of them is that it’s a possible exit strategy for the stakeholders who have contributed with a significant amount of resources and time with the hope to create a fruitful company. Therefore, receiving a certain amount of money, they can liquidate the investment made through the years. Pagano, Panetta and Zingales (1998) found that in three years after an IPO the turnover of the controlling group is larger than the normal, sustaining that IPOs is sometime used as an exit strategy.

Going public increases the visibility to potential customers with respect to a private company, creates a positive image and gives more credibility and exposure. Analysts trying to help their customers give valuation to investors on companies and this helps to better understand the potential of firms.

Public companies can attract top-tier talent, more qualified employees and managers thanks to the prestige an IPO can give (Brau, Fawcett, 2006) and since the company is listed, tools like stock options and other similar performance-based compensation can be used to provide the right incentive to the management and to align the managers’ interests to those of the shareholders even if the salary is lower than what other competitors are offering.

Before a company begins its IPO process it must be audited and this increase in assurance and transparency leads to an easier access to debt market reducing the interest rate and thus the overall cost of capital (Scott, 1976).

The stock price is considered a good firms’ value since it reflects the day-to-day valuation made by investors reflecting the company’s results and the choices of the management.

Being a public company also allows for the use of publicly traded stocks as a means of payment due to the fact that they can be liquidated on any moment. Stock are then considered as a currency that can be bought and sold at a market price at any moment.

IPOs are not free of costs both direct (in terms of time and money) and indirect (underpricing) although each company will perceive this differently.

When a company moves from private ownership to public, it massively increases the number of people who have access to its financial records. Companies are required by stock exchanges, securities commissions and regulators to disclose information on a regular basis and a much great amount is required at the time of IPO included in the offering prospectus.

Botosan (1997) found that’s not all bad, indeed increasing the disclosure can reduce the cost of equity leading to a higher possibility to invest in more projects and raise capital more cheaply.

Other direct costs are the fees paid to lawyers, consultants, accountants and especially investment banks which take fees around 2-7² per cent of the amount raised.

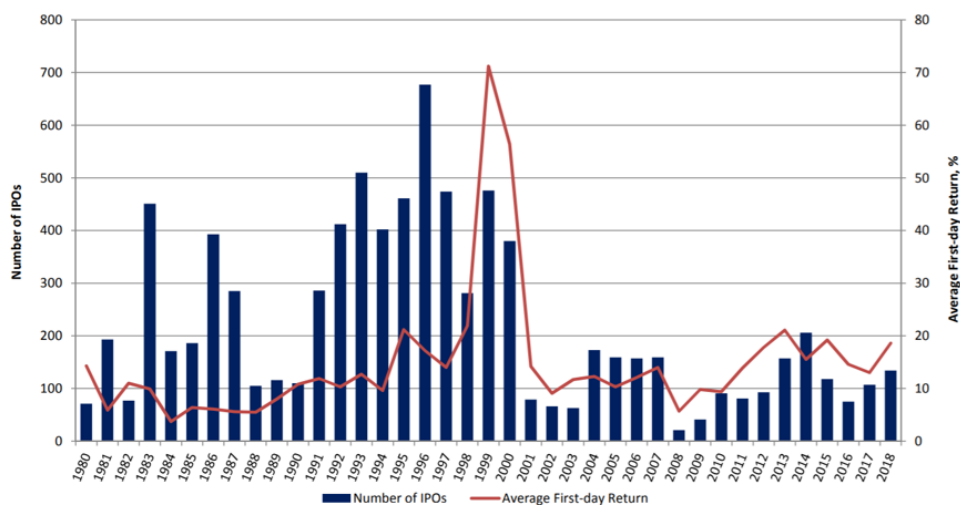
In public companies the managers are the agents of the shareholders and they should act on behalf of, and in the best interest of the shareholders. In order to ensure this the board of directors has the duty to oversee the actions of the management on behalf of the shareholders as long as this doesn't limit their actions.

There is also the potential loss of control if more than 50 per cent of the issuer's voting shares are sold, in fact the average is around 30 per cent (Geddes, 2003) and even if it's not the case, when companies require additional capital to sustain its growth, existing shareholders will suffer dilution and at some point the control might pass to public shareholders.

Investors and analysts are focused on the current/quarter reporting period and shareholders value management's performance in terms of stock price and profits. Thus, the pressure to increase profits and meet analysts' expectations might cause management to focus and prefer short term results instead of a long-term perspective.

Market is driven by expectations and this might be a danger because when something triggers high expectation the market can follow this way of thinking for no reasons ending up with bubbles (like the dot.com). Figure 1 highlights the number of IPOs from the period 1980 to 2018, and the average initial return related to IPOs in the same years. It's easy to see how before the bubble burst companies started the run to be public incentivized from high returns after seeing the companies value dropping vertiginously.

Figure 1 – Number of U.S. Offerings and Average first-day return, 1980-2018.



(Source: J.R. Ritter, UF college of business, Warrington.)

² The percentage might change according to the size of the IPO, the country and the momentum.

The most relevant indirect cost is that IPOs are usually underpriced meaning that first-day return is generally positive. This is a cost because if the shares had been sold at the closing price rather than the offer price, the proceeds of the offering would have been higher or the same proceeds could have been raised by selling fewer shares, causing less dilution of pre-IPO shareholders. In practice, underpricing results in a sort of wealth transfer from the pocket of the issuing firm and its pre-issue shareholders to IPO investors. This phenomenon is also called as “money left on the table” (Loughran & Ritter, 2002). Underpricing phenomenon is analysed in the next chapter.

1.3 - THE IPO PLAYERS

Preparing a company for quotation requires the involvement of a large number of players, each with a specific role to play. The three main actors are underwriters, issuers and investors. An underwriter is any party that assumes and evaluates another party's risk in exchange of a fee. This role is important and is covered by banks. The leading participant and usually the first advisor appointed is a commercial or investment bank. The lead manager (also called sponsor) develops the structure of the offering: helps to appoint other participants, leads the drafting of documentation, coordinates the aspects of the issue and organizes the due diligence. The management of a private company has never started an IPO before and it doesn't have a wide knowledge of the market. Thus banks can offer their experience in the stock exchange listing, their network of knowledge, their reputation and competencies to increase firm's and helping in making the required changes that a company must fulfil. The role of the lead manager in guiding companies and their management to the market becomes crucial.

There are three kinds of arrangements available to the issuing company: firm commitment, best effort and syndicate of underwriters. Under the firm commitment agreement, the underwriter purchases the whole offer and resells the shares to the investing public. This agreement guarantees to the issuing company that a particular sum of money will be raised.

In the best effort agreement the underwriter doesn't guarantee that they will raise a definite amount of money for the issuing company. It only sells the securities on the behalf of the company.

If the IPO is managed by more than one bank, one is selected as the lead or book-running manager. Under the latter agreement, the lead investment bank forms a syndicate of

underwriters by forming strategic alliances with other banks, each of which then sells a part of the IPO. Such an agreement arises when the lead investment bank wants to diversify the risk of an IPO among multiple banks.

The issuer is the company offering its shares to the public and enters in a contract with the lead underwriters.

There are three type of investors involved in the IPO process. According to when they invest, the first type of investors are those who are willing to support start-up companies and are generally represented by venture capitalists. They put the money into promising companies and wait for them to succeed.

The second type of investors are primary investors who are allocated initial shares before the initial date. Underwriters will allocate the initial shares to institutional investor or individual investors with large amount of capital.

The third type of investors starts to invest when the IPO shares become tradable then after the initial date.

Besides them several other players are involved. Lawyers give legal counsel, review company's documents and records to identify potential legal problems. Auditors will help the CFO address accounting issues and prepare the conform letters, which summarize their verification procedures for certain financial information (i.e. financial statements audited) in the prospectus³. The financial printers will print the legal documentations and provide meeting rooms for drafting sessions. In many jurisdictions electronic filing of documents is now possible and, in some cases, mandatory.

1.4 – THE TIMING

After discussed the reasons for having an IPO and the trade-off between the benefits and the costs of going public, another important aspect to consider is the timing. When companies want to explore new ideas and projects it's better to stay private since they can be less transparent to outside investors than public firms and have less pressure from the market. They have more incentives to take riskier projects and to invest in new products and

³ A prospectus is a formal document that is required by and filed with the Securities and Exchange Commission (SEC) that provides details about an investment offering for sale to the public.

technologies. Companies with a solid product or service and a strategic and well-defined road map should take seriously into consideration to go public.

Analysts noted that companies initiate IPO when their business cycle achieves an expansion phase, since then the company has got well-developed activity strategy, good management and personnel team. The company has also gained profits, conquered a significant market share and formed the confidence of clientele and creditors (Teoh, Welch and Wong, 1998).

“The equilibrium timing of the going-public decision is determined by the firm’s trade-off between minimizing the duplication in information production by outsiders (unavoidable in the IPO market, but mitigated by a publicly observable share price) and avoiding the risk-premium demanded by venture capitalists” (Chemmanur, Fulghieri, 1999, p.249).

It seems that IPOs of equity occurs in waves. “A hot-issue market is a period where investor demand for IPOs is especially high” (Shefrin, 2002, p.239). In a hot-issue market, excessive optimism on the part of the investors leads IPO prices to rise above fundamental value on the first trading day and remain so for long periods. Another possible reason for these waves is the likelihood that firms face better investment opportunities during some periods, so the companies decide to go public to raise capital for these investments. However, IPOs appear in clusters during periods in which investors place relatively high values on the companies (Loughran, Ritter and Rydqvist, 1994). As previously argued IPO process is complex and involves significant uncertainty, some theories try to explain how waves change over time according to the market conditions (i.e. dot.com bubble, financial crisis). Other theories rely on the imperfectness of the market and the intention of the issuers to go public when their shares are overvalued.

“In hot new issues markets, far more companies are deemed ready for the public markets than in calmer times. Clearly for many entrepreneurs and their backers, the period 1998–early 2000 was the time to do an IPO” (Geddes, 2003, p.45).

Lucas and McDonald (1990) developed an asymmetric information model where firms postpone their equity issue if they know they are currently undervalued. If there is a bear market valuing too low the firm, given the knowledge of the entrepreneurs, they will postpone their IPOs until a bull market offers more favourable pricing.

It is possible to see patterns of hot IPO markets during the 1980s and late 1990s, in which there was strong economic growth and increasingly stock market valuations. Cold IPO markets were visible during the 1970s, early 1990s and early 21st century, in which there were periods of recession and weak economic growth.

Chemmanur and He (2011) found that going public during a bull market allows companies to have a larger cash holding than companies that decide to go public in a bear market.

Habib and Ljungqvist (2001) describe that IPOs are changing over time and are in line with stock market conditions, the business cycle, and a gradual increase in competitiveness of the underwriter market.

1.5 - THE IPO PROCESS

“Going public is a time-consuming, expensive endeavour that demands meticulous preparation” (Draho, 2004, p.182), the internal preparation can start up to two years before the offer date while external preparations begin subsequently.

Several decisions need to be taken which are extremely important since the company has only one opportunity to go public and has to do it properly.

Fundamental decisions in order to have a successful IPO are the selection of the underwriter and auditor, the choice of the type of offering and in which market sell the shares. Once the process is started the company, working with the investment bank, has produce the information required by the authorities, undertake the road shows, take care of the marketing phase and supervise the relationships with the market. These steps are analysed in the following paragraphs.

The choice of the underwriter

IPOs are managed by investment banks that deliver different services: they have to analyse the financial situation of the company and ensure that it's ready for listing, they have to prepare the drawn and the prospectus, they also have to underwrite the stock offering assuming part of the risk associated with the issue proceeds and in the end they settle the shares to the public and allocate them to investors.

Since the crucial role investment banks have in the IPO process companies adopt a deep selection to determine which bank to hire. The most important investment banks in the market are: Goldman Sachs, J.P Morgan Chase, Barclays, Morgan Stanley, Citigroup, UBS, Merrill Lynch and Credit Suisse. Firms looking which investment bank to hire organizes meetings and interviews in a process called bake-off. To win the mandate investment banks usually prepare a “pitch” book in which they present themselves. In these formal presentations banks highlight their reputation and expertise in the IPO process and the post-IPO performance of

the companies (especially in the same sector of the potential client) they brought public. Subsequently the company chooses the investment bank according to some criteria such as the costs (both in terms of fees and potential underpricing), bank's reputation and expertise.

Which stock market?

Before going public, the firms must choose in which market to list its shares. A firm might be listed in its market, in a foreign market or in more than one (multiple listing). The majority of issuers list in their home country because it's easier and cheaper even though according to Jenkinson and Ljungqvist (2001) firms have become more and more free in their choice of the market thanks to the electronic trading and the irrelevance of national boundaries.

The major markets in US are the New York Stock Exchange (NYSE), the NASDAQ Stock market and the American Stock Exchange (AMEX), in Italy stock market is divided between Telematico Azionario (MTA), the STAR "Segmento per Titoli ad Alti Requisiti" and the segment for small, innovative and high growth firms "Nuovo Mercato".

When companies have a choice between or among exchanges, whether domestic or foreign, they will consider the following criteria when selecting the exchange on which to list their shares. For example, each market has different listing requirements and tend to relate to the size of the company, age and profitability. Once verified to respect the regulations and requirement imposed the firms have to submit an application to the exchange.

Related firms' listings are an important factor in the choice of a listing venue. "The more companies of a certain type already listed on a certain stock exchange, the more likely the business contemplating an IPO will be to join them" (Geddes, 2003, p.53).

Investors are able to place more precise valuation on companies coming to the market if they are familiar with a particular market segment and are more willing to pay full price for the shares if they have a wide and deep knowledge of the industry. Several companies during the 1900s launched their IPOs on NASDAQ stock market which is still recognized as the market preferred by high-tech companies.

Companies may also try to minimize the amount of fees they have to pay to the stock exchange both at the beginning and in the subsequent years. Another important aspect is the liquidity one: issuers believe that some exchanges are more likely to guarantee liquidity and then avoid the risk that the liquidity of the newly public company dries up.

Corwin and Harris (2001) analysed IPOs on NYSE and NASDAQ from 1991 to 1996 finding increased competition between exchanges given that companies are increasingly paying

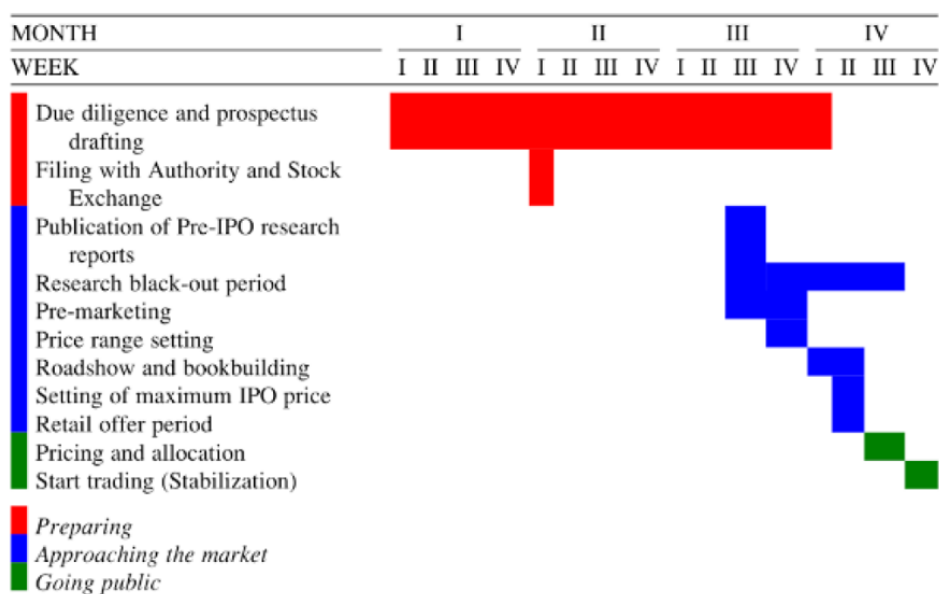
attention on issue costs, market quality, industry characteristics and future financing strategies, especially smaller firms.

Due diligence and prospectus drafting

The beginning of the relationship between the issuer and the underwriters starts with the preparation of the prospectus which is the main document delivered to investors in an equity offering, either IPO or SEO⁴. This document includes the information about the offering (price, number of shares offered, subscription procedure), information about the company (industry, operations, management) and audited financial statements. This is the most important document because it's where issuer tells its story, it contains comprehensive information about the issuer and then it reduces the risk of liability for misleading to potential investors. "The prospectus contains all the financial and non-financial information that potential investors require in order to make an investment decision. It must be both a selling document as well as meeting the disclosure requirements of the local regulator (a 'liability document')" (Geddes, 2003, p.54).

Each country, securities commission and stock exchange has its own specific requirements but standards are meant to enhance comparability of information and ensure a high level of investor protection. The document must be approved by the market authorities (the SEC in US) and issuer and underwriter are responsible for its content.

Figure 2 – Key steps of the IPO process.



Source : IANOTTA, G., 2010. *Investment banking. A guide to Underwriting and Advisory Services* (p.53).

⁴ A seasoned equity offering, or secondary equity offering is a new equity issue by an already publicly traded company.

In parallel with the draft of the prospectus, as it is possible to note from the figure number 2 who resume the key steps toward the IPO, there is the due diligence which is basically a process by which information is gathered about the issuer in order to produce a marketing and a disclosure document that provides full disclosure to mitigate: price not reflecting risk, ill-informed decision making by investors and inaccurate disclosure.

Due diligence can be divided into commercial, financial and legal.

The commercial and strategic due diligence helps the managers to more fully understand the business of the company and accordingly their ability to draw up a selling story. The issuers will look at the main characteristics of the market and the competitive environment including: key market dynamics (size, trends and value drivers), sources of competitive advantage, sources of risk and key success factors.

The financial due diligence looks at both historic and future oriented numbers, sometimes is necessary to adjust the accounting policies in order to produce data more familiar to the investing public. The accountants will provide a comfort letter in which they consent the use of their audit in the prospectus, they confirm their independence and agree on the financial data in the offer document.

The legal part is left to the lawyers who revise important documents such as debt and loan documents, debt instruments, key licenses and documents regarding repurchases of shares.

After the approval of the prospectus and the other documents, the registration statement becomes effective and the final prospectus becomes available to investors.

The marketing phase

The marketing of IPOs is an elaborate process involving three stages: pre-marketing to prepare investors for the issue; formal marketing where direct approaches are made to potential investors and finally the pricing and allocation of the shares.

The pre-marketing phase it's all about preparation. During the time, the company and the advisors will prepare the investment case which is a document including the most salient selling points having the goal to persuade an investor to buy issuer's shares. The goal of this phase is to increase awareness of the issuer in the eyes of investors as well as to elicit feedback from selected investors regarding the investment story and possible pricing of the issue. After the pre-marketing phase a price range is set.

The most time-consuming part of the formal marketing is the presentation of the issue by the issuing company and the investment bank to the potential investors. The presentation takes the form of short meetings (20 to 25 minutes) usually in different financial centre and include

one-on-one sessions or presentation to a large audience. During the roadshow the company tries to convey the investment case as persuasively and dynamically as possible. Investors will ask questions following the presentations and the management must be prepared for all potential questions. Roadshow doesn't add new information about the firm and it represents general information already contained in the prospectus meaning that it's almost more important for the issuer to gather feedback from the investors than for the investors to hear what's already written on the prospectus. During the roadshow investors are solicited to make non-binding bids and a book of orders is created to determine the price of the issue.

Pricing and allocation

The final steps of the IPO involve the price and the allocation of the firm's shares. As stated by Sindelair, Ritter and Ibboston (1994), the pricing of IPOs is a difficult process because it is not possible to observe the market prior to the offering and also because issuing firms are generally young companies with little operating history. There are three frequently used techniques to issue shares in an IPO: Bookbuilding, fixed-price and auctions. Which model is optimal is widely discussed in the literature, in the United States and in several other countries the bookbuilding is the most frequently used method but the action has gained popularity due to the internet (Anand 2005).

In an auction the allocation of shares is based on bids, as stated by Draho (2004 p.218) the underwriter has a passive role, the bids are effectively anonymous, and shares are allocated in a non-discriminatory way to institutional and retail investors. The action by which the unseasoned shares are sold can play an important role in eliciting information from the market participant about their valuation of the share. In a uniform price auction the underwriter sets a minimum offer price and investors bid for a certain price or quantity of shares. After the bids are collected a demand curve is formed by all individual orders and the final price is determined by matching the demand with the fixed supply. Shares are allocated amongst the investors on a pro rata basis. Other type of auctions are dirty auctions where the price is set below the market clearing price and discriminatory auctions where the investor pays what he bids. In practice this mechanism can be used in combination with bookbuilding and fixed price.

Fixed price offerings are priced without first consulting investor demand, it's chosen prior to collecting the orders and is already specified in the preliminary prospectus usually one week before the IPO. The shares are allocated among investors who bid on the day before the IPO on a pro rata basis with the "fair allocation system". The main advantage of this method is

low cost and ease of executing the offer. The investors know in advance what they pay in case they receive a proportion of the shares.

According to Welch (1992), fixed offering can cause an information cascade as investors who observe the actions of previous investors can revise their beliefs about the value of the issue. Consequently, issuers have to underprice their shares to create a positive informational and price cascade.

The bookbuilding is the most used IPO method (Sherman 2001). In the pre-offering market stage, the underwriter with the roadshows surveys the market to find potential investors and sets the indicative price range reflecting analyst's market valuation of the offer. The underwriter then collects the orders and once the book is built the investment bank produces a demand curve of the submitted bids and sets the final price offer. Nevertheless, convincing investors to reveal positive and sincere information about the value of the company is costly because investors know that this information will impact on the final price. At last, which is the main advantage of this method, the underwriter allocates the shares among investors at its own discretion (Benveniste and Spindt 1989). This discretion over allocation is a controversial aspect of the book-building also because not all investors are able to take part in the book-building in the first place. Allocation discretion is used to reward investors that reveal positive information during the process and, as confirmed by Ianotta (2010), the empirical evidence confirm that more informed investors receive larger allocations. Despite knowing investors' demand curve, the final price is not determined only by matching demand and supply but the investment bank maintains a significant discretion in the price and allocation of the shares. If the underwriter can allocate the shares, the risk of issuing equity is reduced significantly and this compensates for the additional cost of higher underpricing.

Jenkinson and Jones (2004) found that book-building is mainly used as a way of allocating stock to longer-term investors preventing the drop of the share price in the immediate aftermarket.

Recently hybrid offerings have been created meaning that a firm can go public using a combinations of different pricing method. The most commonly used hybrid offering is a combination of book building method for institutional investors and a fixed priced offering to retail investors (Kucukkocaoglu 2008). In this way, the institutional investors disclose their information during the book building phase and the price is set. The uninformed retail investors can acquire the shares through the fixed price offering, while not concerning in the price-setting process.

Listing and trading

After the IPO pricing and allocation have been executed the trading begins. Nevertheless, the work of the underwriter is not over, it plays indeed an important role in stabilizing the price of the shares. This price stabilization activity is aimed at absorbing the excess supply of shares and avoid excessive price fall to protect investors against downside risk in the first trading period. The underwriter starts to buy shares if the distribution of shares is not complete and support the price that would otherwise collapse. This direct intervention is called pure stabilization. Conversely, the underwriter starts to sell shares in case of excess demand for the shares and it's called aftermarket short covering. Underwriters may also penalize members of the selling group whose customers quickly "flip"⁵ shares in the aftermarket by taking away their selling concession. This is referred as a penalty bid.

⁵ Flipping is when an investor buys a stock at the offering price and then sells the stock soon after it starts trading on the open market in order to make a profit. This behaviour is highly speculative and is often frowned upon by regulators.

CHAPTER 2 - IPO UNDERPRICING

2.1 - UNDERPRICING ISSUE

The phenomenon of IPO underpricing has been strongly discussed over the last few decades and seems to be independent of time period and geographical area as well as the issuing method. The first empirical and theoretical models have been developed in the early 1970s and extended over the following years. First paper for IPO underpricing was given by Reilly and Hatfield in 1969 which found a 20,2 % of underpricing for DJIA stocks ⁶over a sample period from 1963-1966. Reilly (1973) and Ibbotson (1975) given other empirical evidence in the U.S. stock market. Ritter and Welch (2002) documented significant relationship between different years and the degree of underpricing: 7,4% in the 1980s, 11,2% in the 1990s and 18,1% in the mid-90s for the U.S. market. Evidence for underpricing was especially found during hot markets: from 1999 to 2000 more than \$62 billion were left on the table and the average IPO was underpriced respectively 71% and 57% (Eckbo, 2008). Loughran and Ritter (2004) shown that underpricing is cyclical, in fact the average first-day return on IPOs was 7% in the 1980s, then it doubled to 15% in the 1990s before jumping to 65% during the internet bubble years and then returning to 12% during the period 2001-2003. The phenomenon is not only concentrated in the U.S. stock market, Ritter (2003) summarized underpricing finding from various countries (i.e. between 1990s and 2000 256,9% in China and 104,1% in Malaysia).

Nevertheless, fundamental misevaluation or asset-pricing risk premia are difficult to explain the high first day return of new issued stocks (Ritter and Welch 2002) and accordingly, several theories evolved over the last decades to explain underpricing.

Underpricing can be calculated using the “Raw internal return” formula:

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

Where $P_{i,1}$ is the first day closing price and $P_{i,0}$ is the issuing price or offer price.

Alternatively it can be calculated using the “Market Adjusted Initial Return” formula, which also takes into consideration the general performance of the stock market in the time lag between the closing date of the subscription of the shares and the first day of trading:

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

Where $MI_{i,1}$ is the market index at the end of the first trading day, $MI_{i,0}$ is the market index at the end of the share's subscription period. This formula is more accurate than the previous one because the initial return is "adjusted" with the return of the market not allowing distortion if the market itself is too volatile for other reasons.

Underpricing is indeed an opportunity cost for a firm going public. According to Ritter's data in the period 2001-2018 \$65 billion have been left on the table, almost the same as the period 1999-2000 with \$66 billion.

Underpricing is still a persistent phenomenon illustrated and investigated in almost all countries with its differences in terms of population, institutional, legal and regulatory frameworks. The objective of this chapter is to illustrate and analyse the main causes of underpricing that have been identified in the literature.

2.2 - UNDERPRICING THEORIES

The theories on underpricing can be approximately aggregated into the following five categories: asymmetric information theory, institutional theory, ownership and control theory, behavioural theory and prospect and mental accounting theory.

The following paragraphs will outline the main theories of IPO underpricing that support the subsequent analysis and discuss some empirical evidence.

2.2.1 - Asymmetric information theories

Among all the theories that aim at explaining the phenomenon of IPO underpricing, those based on information asymmetries are one of the first developed and they are now well established (Ljungqvist, 2007). When the research started to focus on underpricing, the strand of literature on information asymmetries received a lot of attention by academics and it became very popular. In the subsequent years, researchers realized that information asymmetries were not able to fully justify the phenomenon of underpricing.

The strand of literature on information asymmetries explain that underpricing is caused by the superior information owned by one of the three key parties involved in an IPO process: the issuing firm, the bank who underwrites the issue and the investors.

Winners' curse model

Among the different asymmetric theories, the best-known model is presented by Rock (1986) which is an application of Akerlof's (1970) lemons problem⁷.

The Rock's model, also called the Winner's Curse model, relies on two important pillars. The first pillar is that it identifies two classes of investors that use to participate in the initial public offerings market. These two categories differ for the level of information they own about new offerings. The first category is formed by investors with superior information. Thanks to the research they conduct they have perfect information about the realized value of new issues, then they bid only on those offerings that they found attractively. The other category is the one of the uninformed investors. This category comprises all those investors that could not be defined as informed and according to Rock (1986) it comprises also the issuer. Since the uninformed do not have information on new issues they are not able to discern those offerings that would guarantee positive economic results from those that wouldn't, so they subscribe all new issues.

The second pillar of the Rock's model is that it is set in a market for firm commitment offerings. In a firm commitment offering, as described in Chapter 1, the issuing firm and the underwriter agree on the price and the quantity of shares to be issued. Once the price is fixed, no adjustments could be made. Given this rigidity on prices and quantities, the IPO could face either excess supply or excess demand. In case of excess supply there will be unsold shares. In case of excess demand – oversubscription – the shares are rationed by the underwriter. The model of Rock assumes that oversubscription arises only when informed investors subscribe the new issue.

Combining information asymmetry between informed and uninformed investors and shares rationing in case of excess demand, the Rock's model explains the mechanism behind the underpricing phenomenon. Overpriced IPOs will be subscribed only by uninformed investors who can't discriminate. Underpriced IPOs instead will be subscribed both by informed and uninformed investors and, according to the assumption of the model, there will be an excess of demand for the offering and a rationing will take place. The uninformed investors will fully subscribe issues that offer negative return and receive a small portion of shares in the underpriced offerings. Rock (1986) says they are subject to the winner's curse. Given the uninformed investors' expectation to receive a disproportionate low lever of underpriced

⁷ In this model the economist examines how the quality of the goods traded in the market can degrade in presence of information asymmetry between buyers and sellers. In fact, buyers are not able to distinguish between high and low quality and are willing to pay a fixed price that averages the two values.

share they revise their valuation of IPOs and they will invest if the return is higher or equal the riskless rate. In order to attract the uninformed investors to the initial public offering market investment banks should price the shares at discount - named underpricing - guaranteeing a return to them at least riskless. A certain degree of underpricing is therefore needed to attract uninformed investors. At the same time firms seeking to go public benefit from underpricing, because the participation in the IPO market for the uninformed investors is crucial and their capital is needed by assumption. Rock's (1986) model is still viewed in the literature as the starting point to analyse the effects of information asymmetries among investors on IPO underpricing (Levis 1990, Katti & Phani 2016). However the model is developed only in theoretical ground and the author himself highlights the limited possibility to conduct empirical analysis: "The crucial test of the model involves observing the degree to which shares are rationed on the offer date [...] however, is hard to obtain for several reasons" (Rock, 1986, p.205). On the reliability of the Rock's model, Keasey and Short (1992) argue that the model is based on conflicting assumptions and analysis in contradiction with its core. The aspects criticized by Keasey and Short (1992) concern both the assumptions and the internal consistency of the model. A critical point they identified in the Rock's model deals with the concept that underpricing should be granted to uninformed investors to compensate them for the winner's curse they suffer when they receive overpriced shares. If the winner's curse is to be considered as a new issues market phenomenon, the explanation of Rock suffers the free-riding problem. Each issuer wants its shares to be priced the highest while getting the full subscription of the new offering. For this reason, issuers would have the incentive to cheat and not to underprice since they offer their shares in the IPO market only once. In this way, issuers would benefit from the higher offer price even though they damage the market by lowering returns for uninformed investors and pushing them out of the new issues market. This point is partially solved by Beatty and Ritter (1986) who argue that investment banks find optimal to enforce the right level of underpricing thanks to their expertise in the IPO market. If issuers fail to underprice correctly, the reputation decreases and in the long-run they will lose market share.

Another questionable point of the winner's curse model is the distinction between informed and uninformed investors. Keasey and Short (1992) wonder why uninformed investors do not become informed and why informed investors do not have the incentive to sell their superior information to the uninformed. They argued why uninformed investors should participate in the new issues even though they can earn only the riskless rate in equilibrium. In addition Keasey and Short (1992) find difficult to believe that the underwriter and the issuer have less information than the market as a whole. According to them it's difficult to comprehend how

the market can pool together the knowledge of investors before trading has started in the secondary market and the knowledge among individual investors hasn't spread yet.

The key element to perform a practical test of the Rock's model is to obtain degree of rationing applied by underwriters. As stated by Rock (1986) underwriters are reluctant to provide this information, they don't want to share to the public their preferential behaviour in allocating shares. To overcome this weakness, Koh and Walter (1989) and Levis (1990) base their tests of samples of IPOs obtained from two market in which information on allocation could be observed.

Levis (1990) presents the first direct test to Rock's model in the European market. The allocation in this market is done on a pro-rata basis then information about the degree of rationing is freely available. The author collects allocation of 123 new issues in London stock Exchange and Unlisted Securities Market from January 1985 to December 1988. Rock claims that "if the model is correct, weighting the returns by the probabilities of obtaining an allocation should leave the uninformed investors earning the riskless rate" (Rock, 1986, p.205). Levis (1990) obtains evidence that, since the uninformed investors subscribe all new issues, they will earn a return that is not statistically different from the riskless rate. This outcome is quite unexpected considering the high level of underpricing observed during the first days in the market. The author finds a market adjusted rate of return of 8.64%. It has to be considered that the net return an investor obtain is lower than the raw return obtained only from assigned shares because the former is reduced by fixed costs to submit the offer. These costs could be the opportunity interest cost on fund used to subscribe new issue or administrative costs.

Koh and Walter (1989) analyse a sample of 66 IPOs between January 1973 and June 1987 on the Singapore stock exchange. In the Singaporean market, in case of oversubscription the basis used for rationing are disclosed.

Similar to the analysis of Levis (1990) they find that the likelihood of receiving an allocation is negatively related to the degree of underpricing, and that average initial return fall substantially from 27% to 1%, when adjusted for rationing. They test another important assumption of the Rock's model which is that informed investors are able to earn greater returns than uninformed because they invest only in underpriced issues. They observe that large informed investors are much more reactive than uninformed investors in underpriced issue. They find that an additional one percent point of underpricing leads to a 93% increase

in applications by informed investors while the uninformed investors' demand increases only by 10%.

2.2.2 - Information Revelation Theory

The centre of the revelation theory is based upon the way in which informed investors reveal their information about the assumed value of an IPO. According to the assumption that some investors are better informed than other investors and the issuer, investment banks must find a way to obtain information from the informed investors before the price is set even though they have no incentive to disclose information because it would lead to a loss in underpricing for them.

Benveniste and Spindt (1989) introduced the "information gathering theory" sustaining that book-building is an appropriate mechanism to induce investors to reveal information about the demand for shares in the pre-selling phase. During the book-building, in a phase called road-show, the underwriter can collect enough information to allocate the shares. Investors with low bids will obtain few shares, whilst investors with high bids will obtain many shares. This mitigates the incentive for the investors to mispresent positive information: doing so results in exclusion from the IPO. If the IPO stock is underpriced, the investors have the incentive to reveal their information because they want to participate to the IPO (Eckbo,2008).

Cornelli and Goldreich (2001, 2003) tested empirically this book-building theory using information on IPO books of a leading European investment bank active in up to 37 cross-border IPOs outside U.S. They examine two different types of bid: market (or strike) orders and price-limited bids. Unlike strike orders, price-limited bids specify a maximum price an investor is willing to pay for a given number of shares. Hence such bids convey more information to the underwriter than strike order. They find that price-limited bids receive 19% greater allocation than strike orders, which gives generally support to the Benveniste-Spindt model and that information revelation theory is rewarded. Nevertheless Jenkinson and Jones (2004) analysing a smaller sample of 27 IPOs managed by a different European investment bank found less supportive evidence for book building theories.

To support Benveniste and Spindt theory, Hanley and Wilhelm (1995) show that institutional investors are being rewarded much more than retail investors. Observing 38 IPOs from 1983 to 1988 they highlighted that institutions receive on average 66,8% of the IPO. Better

informed investors are rewarded with higher allocation having superior information. Underpricing then seems necessary for the investors to gain from the large allocation. Similarly, Jenkins and Ljungqvist (2001) find that institutional investors receive greater allocation by about 50 to 66 percent when banks can allocate stock with discretion. “If the underwriter is doing his job well, each investor’s reward will just reflect the marginal value of private information” (Jenkinson and Ljungqvist, 2001, p.91).

Revisions in the offer price and the number of shares offered during book building likely reflect investors’ level of interest and the aggregate nature of their information (Benveniste and Spindt 1989). An IPO for which positive information is revealed should be priced towards the upper end of the indicative price range while a less well received offering should be priced towards the lower end. Benveniste and Spindt (1989) suggest that underpricing should be concentrated among IPOs drawing the highest level of pre-market interest. In other words, even though the underwriter adjusts the price upwards, he does so only partially, in order to leave enough money on the table to compensate informed investors for their truthful revelation.

Hanley (1993) was the first to provide empirical evidence on this ‘partial adjustment’ phenomenon. He analyses 1430 firm commitment IPOs from January 1983 to September 1987 in U.S. finding. The results confirm the theoretical model of Benveniste and Spindt (1989) suggesting that “Underwriters and issuing firms prefer to substitute underpricing for increased allocation. Leaving money on the table in the form of higher initial return either to the underwriter or to the issuing firm than reducing the size of the owner’s residual claims” (Hanley, 1993, p249).

Principal-agent theory

It has been identified that IPO underpricing might be caused by another case of information asymmetry: the relationship between the issuers of new securities and the investment bankers. Theories of book building highlight the important role of investment bank in eliciting valuable information for the price-setting, and the discretion they have over the allocation. Loughran and Ritter (2004) stress the ‘dark side’ of these institutional arrangements underlining the potential for agency problems between the investment bank and the issuing firm.

IPO underpricing represents a wealth transfer from the issuer to the investors, hence investors compete for allocations of underpriced stocks. This competition is influenced by side-payments from the investors to the underwriter in form of trading commissions paid on

unrelated transactions (Loughran and Ritter, 2002). Investment bankers might allocate underpriced stock to executives at companies in the hope of winning their future investment banking business in a practice called ‘spinning’⁸. Nevertheless, even if underwriting fees are proportional to IPO proceeds and then inversely correlated with underpricing, might happen that the bank’s private benefits of underpricing greatly exceed the implied loss of underwriting fees.

When the effort is not perfectly observable and verifiable, the banks find themselves in a moral hazard situation when acting as the issuer’s agent in selling an IPO.

Baron and Holmström (1980) and Baron (1982) construct screening models which focus on the underwriter’s benefit from underpricing. The issuer is in a position of informational disadvantage and delegates to the underwriter, which has more information, the pricing decision to the bank. This superior information is used by the bank to select a contract of IPO prices depending on the demand of the market: if the demand is low, the offer price will also be low and the underpricing spread will be high and *vice versa* if the demand high. This optimizes the unobservable selling effort by making it dependent on market demand. In comparison to a world with a first-best solution, the second-best contract that is incentive compatible involves underpricing and allows the underwriter to capture positive rents. The higher uncertainty on the firm’s value, the greater the asymmetry of information between the issuer and the underwriter, and thus the more worthy the underwriter’s job becomes.

In order to mitigate agency costs the issuers can monitor underwriter’s selling effort and bargain over the price or they can use contract design to realign the bank’s incentives by making its compensation an increasing function of the offer price. Ljungqvist and Wilhelm (2003) show that underpricing is lower, the greater are the monitoring incentives of the issuing firms’ executives.

Ljungqvist 2003 studies the role of underwriter compensation in mitigating conflicts of interest between companies going public and their investment bankers. Making the underwriter’s compensation more sensitive to the issuer’s valuation should reduce agency conflicts and thus underpricing. The author shows that in a large sample of U.K. IPOs contracts with high commissions lead to lower underpricing. Thus the issuing firm’s contractual choices affect the pricing behaviour of IPO underwriters.

⁸ Spinning is a conflict of interest situation now prohibited where an investment bank offers under-priced shares of a company’s IPO to the senior executives of a third-party company in exchange for future business with the investment bank.

Muscarella et Vetsuypens (1989) to overcome the information asymmetry test Baron's model with a small sample of 38 self-underwritten investment bank in the 1970s and 1980s. Since issuer and underwriter are the same there can be no agency problem. However the 38 IPOs appear to have been underpriced approximately as much as other IPOs. Since the sample is small and there aren't so many investment banks taking themselves to the public, this approach doesn't lend itself directly to a wider context.

Over the years investment banks started to become pre-IPO shareholders in many IPO companies (Ljungqvist and Wilhelm, 2003), they often acquire stakes indirectly via venture capital operations. By the year 2000, investment banks were pre-IPO shareholders in 44% of companies going public (Eckbo 2008) and this should reduce their incentive to underprice the stocks, and consequently harm the issuer. Ljungqvist and Wilhelm (2003) support this prediction. The greater the firm's equity owned by the investment bank, the lower are the first-day underpricing returns.

2.2.3 - Signalling theories

Another group of asymmetric information models reverse Rock's assumption regarding the information asymmetry between issuing firms and investors. This theories suppose that companies, especially the executives, are the most informed party about the company's present value and have better information on risk and future cash flows than investors. Thus, underpricing might be used to signal the company's true high value and to convince potential subscribers of their value. It's costly but if successful, signalling may allow the issuer to return to the market to sell equity on better terms in the future. Ibbotson (1975), the first who came up with the IPO signalling literature, stated that issuers underprice their IPOs in order to 'leave a good taste in investors' mouth.

Assume that there are two type of firms, denoted by high and low quality and it's impossible for investors to distinguish between them.

Firms signal their quality by acting in a two-period model. At the IPO the good firms deliberately choose to underprice the issue expecting to recoup money left on the table at the seasoned equity offering when their quality is known by investors. Therefore the return to the equity market through a seasoned offering is part of a predetermined strategy.

High quality firms have the incentive to signal their higher quality in order to raise capital on more advantageous terms and low-quality firms are going to do the same. The signal in the IPO signalling models is the issue price. In the Welch (1989) model at a certain point in time

(between the IPO and the SEO) the firm's true value is revealed to investors and this expose low-quality firm to the risk that any cheating on their part will be detected before they can benefit from imitating the high-quality issuers' signal.

The risk of detection and the implied reduction in IPO proceeds are enough to deter the low-quality firms from imitating the high-quality ones and the latter can influence investors' after-market-beliefs about its value by leaving money on the table at the IPO. High-quality firms then recoup the money when they return to the market in the future while low-quality ones can't do the same.

In common with other asymmetric information theories of underpricing, the signalling models predict a positive relation between pricing and ex ante uncertainty about the firm value.

Jegadeesh, Weinstein, and Welch (1993) using data on IPOs between 1980 and 1986 find that the likelihood of issuing seasoned equity and the size of seasoned equity issues are positive correlated with IPO underpricing, as expected. However, they note that these statistically significant relations are relatively weak economically.

For instance, the least underpriced quintile of IPOs face a 15.6% likelihood of issuing seasoned equity, compared to 23.9% in the most underpriced quintile.

Additional considerations have to be made on the value of outstanding shares when news of a seasoned offering occur. Usually, companies announcing seasoned equity offerings experience negative announcement-date returns (Čornanič & Novák, 2015). The market could suppose that managers – which are better informed – are issuing a capital increase because they believe that the shares of their company are overpriced. In this case the seasoned offering gives negative signals on the intrinsic value of the firm. As an alternative, investors may suppose that the firm is trying to raise equity because it is not able to finance its investments using cheaper financing sources, as retained earnings or debt. Instead, if investors understand that the seasoned offering is part of a rational signalling strategy they react in a different way. Welch stated that in the signalling framework, “the value of outstanding shares falls less upon news of a seasoned offering when a firm has played an underpricing equilibrium” Welch (1989, p.442), meaning that in this scenario we would expect a less negative stock price reaction in response to SEO announcements by ‘high-quality’ companies.

Welch's model has been extended in the following years by himself (1996) who endogenizes the decision on how long to wait before returning to the equity market. The longer a firm

waits, the greater is the probability that nature will reveal its true value. For this reason a high-quality firm can afford to wait longer, but the cost of this strategy is that it may not receive funds when it most needs them. Empirically, Welch finds that the time to SEO increases in IPO underpricing while firms that return to the market earlier do so after experiencing high post-IPO stock market returns. Welch (1996) asserts that in the sample of IPOs he analysed, revelation occurs with 30% probability in a year and the drawback of the 'waiting costs' are 15% of the firm's value.

Michaely and Shaw (1994) examine the signalling hypothesis for a sample of 947 US IPOs during 1984-1988. The authors study the signalling based model of IPO underpricing and they note that the decision on how much money to leave on the table and the possibility to issue equity in the future are not independent of each other in the signalling framework. High underpricing signals the market to expect huge returns in seasoned equity offerings as well. Michaely and Shaw (1994) estimate a simultaneous system using underwriter reputation to identify the level of underpricing and post-IPO performance. The findings are in contrast with the model because the decision on how much to underprice is not significantly related to the reissue decision and vice versa. They agree with Jegadeesh, Weinstein and Welch (1993) concluding that the firms that portray huge dividends and huge earnings during first two years of trading show tend to underprice less. Thus, the high quality firms are not found to leave money on the table to signal their quality.

Kaustia and Knüpfer (2007) find a very strong link between personal experience with IPOs and future subscriptions. The returns experienced by an investor have strong explanatory power incremental to common information such as returns from other IPOs (those not subscribed by the investor) and the general market. This finding is consistent with reinforcement learning theory repeating behaviour that produced good outcomes in the past and avoid behaviour that produced bad outcomes.

Kaustia and Knüpfer (2007) used data on all retail investors participating in all IPOs in a market (183,000 investors and 57 IPO's in Finland over 1995–2002) to study the impact of past experience on future actions. They examined empirically what impact incremental forecasting powers of personally experienced investment outcomes have for future actions. The actions were subscriptions to the offerings, and the outcomes were determined by IPO stock performance. They founded that personal experience exerts an incrementally significant impact on future action. Controlling for IPO fixed effects, which encompass the effect of offer

characteristics such as size and pre-offer publicity, but also market returns and previous IPO returns, they founded personally experienced return to be an important determinant of future IPO subscriptions. The impact of personally experiencing good returns, rather than merely observing them, was consistent with reinforcement learning. They also identified pairs of hot and cold IPOs with offer dates very close to each other and track the future subscription activity of investors who make their first IPO subscription in one of these offerings. More than twice as many investors participate in a subsequent offering if they first experience a hot offering. The effect continues to be strong for subsequent offerings as well.

2.2.4 - Institutional theories

There are three main institutional explanations for IPO underpricing. First, the litigiousness nature of American investors has produced a legal insurance or lawsuit hypothesis. This hypothesis appeared in the literature with Logue (1973) and Ibbotson (1975) stating that companies voluntarily underprice their stocks to reduce the likelihood of future lawsuit from shareholders disappointed with the post-IPO performance of their shares.

This explanation is somewhat U.S.-centric, albeit underpricing is a global phenomenon. Strict liability laws are not economically significant in Germany (Ljungqvist, 1997), Japan (Beller, Terai, and Levine, 1992), Sweden (Rydqvist, 1994), Switzerland (Kunz and Aggarwal, 1994), or the U.K. (Jenkinson, 1990) even if they have experienced underpricing.

The second hypothesis relates to one of the services provided by the underwriters in connection with the IPO: the price stabilization. This practice of price support has the intention to reduce price drops in the after market for a few days or weeks.

The third hypothesis is that, depending on the tax situation, executives may prefer more or less underpricing, to exploit tax advantages.

Underpricing as a legal insurance

Underwriters and issuer are considerably exposed to the risk of litigation by investors if material facts were mis-stated or omitted from the IPO prospectus.

According to Lowry and Shu (2002) almost 6 percent of companies went public between 1988 and 1995 were sued after the IPO, with damages calculated for 13.3% if IPO proceeds. Hughes and Thakor (1992) and Hensler (1995) argue that intentional underpricing may act like insurance against such securities litigation. The reason behind this behaviour is that lawsuits are obviously costly to the defendants, directly with damages, legal fees, diversion of management time and also in terms of the potential damage to their reputation

capital: investment banks under litigation may lose the confidence of their regular investors, while issuers may face a higher cost of capital in future capital issues. For Hughes and Thakor there is a trade-off between minimizing the probability of litigation, and hence minimizing these costs, and maximizing the gross proceeds from the IPO (and thus the underwriter's commission). Primarily, they assume that the probability of litigation increases in the offer price: the more overpriced an issue, the more likely is a future lawsuit. In addition, they predict that underpricing reduces not only the probability of a lawsuit, but also the probability of an adverse ruling conditional on a lawsuit being filed.

Drake and Vetsuypens (1993) investigate the negative link between the probability of litigation and underpricing. They analyse a sample of 93 IPO firms that were sued and compare them with a sample of 93 IPOs with the same characteristics in terms of size, underwriter prestige and year. The findings are inconsistent with the legal insurance hypothesis given the fact that sued firms result underpriced the same as the others and underpriced firms are sue more often than overpriced firms.

Lowry and Shu (2002) in order to include the ex-ante analysis take into consideration the probability of being sued. Careful analysis takes into consideration simultaneity problem: Firms choose a certain level of underpricing to reduce the probability of litigation, but the level of underpricing they choose depends on the probability of being sued. Put differently, greater underpricing reduces litigation risk, but greater litigation risk requires more underpricing.

They proposed a 2SLS approach to avoid the simultaneity problem, using the prior market-index returns in the underpricing equation and the IPO firm's expected stock turnover in the litigation equation. The outcome of the model is consistent with the lawsuit avoidance hypothesis and underpricing increases with the predict probability of lawsuits. It's also interesting to note that greater underpricing does not appear to have much deterrence effect: the probability of being sued does not decrease in the instrumented underpricing return, at least not at conventional significance levels.

Price stabilization

As discussed in the previous chapter, underwriters have the possibility to influence the first-day return with their own trading activity in order to support the price of the IPOs they guide. The main reasons behind this behaviour are to stabilize the price in the initial trading activity and facilitate the distribution of the security decreasing the probability of being sued for bad performance issues (Asquith et al., 1998). This price support influences first-day IPO returns by hiding the real initial return distribution and by giving the false impression that abnormal

returns are a constant characteristic of IPOs (Reber & Vencappa, 2016). The trading activity in the aftermarket by underwriter affects the closing price on the first-day and it's not only the result of investors' trading activity.

According to Aggarwal (2000) there are three types of aftermarket activity carried on by underwriters:

Pure stabilization: underwriters keep buying shares at a fixed price which is the offer price. The risk to buy an excessive number of shares is partially mitigated by the possibility to take short-positions and the use of the over-allotment option (Ellis 2006).

Aftermarket short covering: taking a short position before the issuance underwriters can sell more shares than the quantity originally offered. This practice is called overallotment or "green-shoe" option⁹ and it's useful when the demand is higher than expected. The option allows underwriter to sell additional shares up to a maximum of 15 percent more than the original offer. The option could be exercised after the issue and no more than 30 days later the IPO. In this way underwriters can cover their position issuing more shares. Instead, if the demand is low, the prices will decline and they can normally buy the shares in the market to cover the short position and boost the price.

Penalty bids: underwriters can penalize the members of the syndicate if they allocate shares to those investors who, after the receiving of the shares at the IPO, immediately sell them in the secondary market. Those investors are called flippers and the members of the banks may lose their concession to allocate shares as a penalty.

The goal of the first two activities is to support price by stimulating the demand of shares while the third one has the aim to support the price by limiting the supply. Clearly, underwriters may use a combination of these activities to stabilize prices. During the road show the underwriter starts to get a prior understanding on what kind of strategy of price stabilization he should adopt. In this phase, receiving the feed-back from the investors is necessary to assess the demand for the IPO. If the demand is expected to be low, the underwriter has to set its short position and define the penalty bid. If the demand is weak, the short position will be covered by buying shares sold by flippers. Doing so, the selling pressure by flippers is absorbed with open-market transactions by the underwriters. The efficacy of the price support is dependant to the size of the short position of the underwriter with respect to the quantity of flipping. If the short position is not sufficient to contrast the selloff of flippers,

⁹ Overallotment options entitle the underwriter to purchase additional shares (usually 15% of the offer size) from the issuer at the IPO price. Such options are sometimes called 'green shoes'.

the price will crash unless the underwriter takes a long position to compensate the excess of supply.

If the demand for the IPO is high instead, flippers won't cause the price drop and the underwriter will cover its short position by exercising the overallotment option up to fifteen percent.

Aggarwal (2000) analyses the short covering activity on a sample of 114 IPOs issued in U.S. markets between May and July 1997. The empirical analysis confirmed the price support given by the underwriter at negligible costs.

Tax

Underpricing may be beneficial from a tax perspective. The reason behind this theory is that if the salary is more heavily taxed than capital gains, paying employees with appreciating assets such as underpriced stock might lead to a reduction in tax expenses.

Rydqvist (1997) studies the Swedish IPO market and shows a relationship between the tax rate and IPO underpricing. He finds that an increase in the tax rate for appreciating assets leads to a decrease in underpricing. Similar results were found in the U.S. market by Taranto (2003).

Stock options' holders pay taxes in two ways: when they exercise the option (the income tax between the strike price and the market value) and when they sell the underlying stock they acquired at exercise (capital gains tax on the difference between the market value and the sale price). Given the fact that capital gains tax liability is deferred and capital gains on tax rates are typically lower than income tax rates, the managers prefer market value to be as low as possible.

Clearly, tax benefits may help to examine cross-sectional underpricing returns but alone they can't explain the phenomenon of IPO underpricing (Eckbo, 2008)

Ownership and control

Going public is often a step towards the separation of ownership and control. Ownership is important for the influence it can have on management's incentives to make optimal decisions on behalf of the company. Agency problems may arise because the stockholders are outside the firm and they assess management conduct only by evaluating the limited amount of information they are provided. Managers can take advantage of this situation to extract benefits for themselves by taking decisions that are in their own interest but not in the interest of the firm.

Brennan and Franks (1997) see underpricing as the opportunity for the managers to allocate shares carefully when taking their company public and protect their private benefits. In particular, they allocate shares to small investors to avoid pressing scrutiny and because they want to reduce the possibility of a hostile takeover increasing dispersion.

Underpricing is seen as a tool used to generate excess demand giving the managers the possibility to allocate shares to selected investors, in particular those who end up holding small stakes in the business.

Brennan and Frank (1997) analyse a sample of 69 U.K IPOs between 1986 and 1989. Results confirm that large bids are discriminated in favour of small ones and the more underpriced the more oversubscribed the IPO is.

Booth and Chua (1996) argue that ownership dispersion is not only the results of a will to protect private managers' benefits, but also because it leads to a more liquid secondary market. Zingales (1995) instead, affirm that shareholders' dispersion increases the bargaining power when managers tries to sell the controlling stake and increase its price.

The assumption of Brennan and Franks of underpricing as a mean to retain control is in contrast with Zingales (1995) who sustains that the IPO is often a step in a multi-period sell-out strategy.

The empirical evidence seems more favourable with the Zingales' theory.

Pagano, Panetta and Zingales (1998) show that most Italian IPOs are followed by private sales of controlling block to large outside investors. Indeed, control turnover is twice as common in newly listed firms as in the rest of companies.

Underpricing is not the only solution to protect the benefits of control. Issuing non-voting shares would guarantee that managers could retain control of the company and all attendant private benefits. Non-voting shares tend to trade at lower multiples than voting shares. This voting discount could be smaller or larger than the money left on the table via underpricing.

Smart and Zutter (2003) find that U.S. companies that issue non-voting stock in their IPOs are less underpriced and have higher institutional ownership after the IPO. This is consistent with the notion that non-voting stock can substitute for the Brennan–Franks mechanism. At the same time, Smart and Zutter find that non-voting IPO shares trade at lower multiples, though they do not investigate how these compare with the monetary benefit of reduced underpricing.

Stoughton and Zechner (1998) develop a theory completely opposite. Underpricing is the reason to obtain the desired shareholding structure. The difference with Brennan and Franks (1997) theory is that managers with the oversubscription and the strategic rationing prefer to allocate shares to large shareholders instead of favouring the smaller ones. Large shareholders

are seen as institutional investors and have more expertise in monitoring the firms' activity. Small investors instead may not be able to observe the management activity and it could be expensive for them to engage monitoring activities. Therefore large investors are preferred in case of strategic rationing because their monitoring activities ensure that management decisions are taken in the best interest of the whole group of shareholders. The increased control and the realignment of interest by all categories lead to an increase in the firm's value. Small investors than are able to exploit this value increase free-riding the monitoring activity of institutional investors and enjoy the positive externalities that these activities create.

The prediction of Brennan and Franks and Stoughton and Zechner are very different.

The first reason is that the models are placed in different institutional environment. Brennan and Franks model an IPO mechanism with fixed price and no response to demand of shares while Stoughton and Zechner model a book building regime with discretionary allocation.

The second reason is that in the Stoughton and Zechner model, managers internalize the agency costs lowering the price that investors are willing to pay for the stock while in the Brennan-Franks model this condition is absent.

2.2.5 - Behavioural theories

This strand of literature builds the next group of explanations for underpricing. Differently from the previous literature, this one is still an immature area of research became popular during the last decades. The basic assumption is that either irrational investors bid up the price of IPO shares beyond their actual value, or the issuers behave irrationally failing in putting pressure on the investment banks to reduce underpricing.

Cascade models

The theory of "information cascades" (Welch, 1992) is an explanation of underpricing as the irrational behaviour of individual investors. Information cascades can take place in IPOs if investors base their investment decisions sequentially. Regardless their own information, later investors condition their bids on the bids of earlier investors. Successful initial sales are interpreted by subsequent investors as evidence that earlier investors held better information, encouraging later investors to invest irrespectively their own information. Conversely, disappointing initial sales can dissuade later investors from investing irrespectively of their private signals. Therefore, it's clear important role of early investors in determine the success or the failure of an offering. The possibility of cascades gives market power to early investors

who can demand more underpricing in return for committing to the IPO and start a positive cascade. If they bid, all subsequent investors will bid but if they don't all investors will desist from bidding. In this way underpricing could be explained in part by informational cascades.

Investors sentiment

Behavioural finance is interested in the effect on stock prices of "irrational" or "sentiment" investors. The potential for such an effect would seem particularly large in the case of IPOs, since IPOs firms are "young, immature, and relatively informationally opaque and hence hard to value" (Ljungqvist, 2007, p. 412).

The first paper to model an IPO company's optimal response to the presence of sentiment investors is Ljungqvist, Nanda, and Singh (2004). They argue that the demand side of the IPO market is made of two type of investors. The first type is made by rational investors. They have strong knowledge on what they are doing and they are able to form an opinion about a firm's value that corresponds to the fundamental value of the firm. This category includes institutional investors. The other category is made by sentiment investors. This category is quite small, unsophisticated and they are more vulnerable to episode of optimistic or pessimistic sentiment about the stock market. This sentiment is originated by the lack of skill to distinguish the noise from relevant information and this results in incorrect about the fundamental value of a firm.

The basic assumption of the model is that it does not rely on private information or information asymmetry.

The issuer's objective is to maximize the excess valuation of the sentiment investors over the fundamental value of the stock. Thus Ljungqvist et al. (2006) sustain that flooding the market with stock will depress the price and so the optimal strategy involves holding back stock in inventory to keep the price from falling. To capture the surplus of the sentiment investors, issuers should sell their shares in stages. This strategy known as "staggered sale" is prohibited by the law and to bypass this limitation, underwriters allocate shares to institutional investors for subsequent resale to sentiment investors and regularly maintaining the restricting supply. Eventually, nature reveals to all investors the fundamental value of a firm and when this happens the stock price of this firm falls. In this case investors holding shares in their inventory will suffer from the price drop. Underpricing in this model is conceived as a compensation for the inventory risk they bear.

If the staggered sale is not carried on by investors who cheat, the model of Ljungqvist et al. (2006) doesn't work. For the inventory-holding strategy to work effectively, there should be a

dominant investor, or the underwriter should be able to impose cooperation among regular investors by offering inducements or by threatening punishments.

Another weakness of the model of Ljungqvist et al. (2006) is that if the price exceeds the intrinsic value of shares by a large amount, informed traders or arbitrageurs may be attracted by this profitable opportunity and they may short-sell the overvalued shares. If short-selling takes place, the stock price declines and both sentiment and regular investors suffer losses even in for Ljungqvist et al (2006) this hypothesis is unlikely to happen. Short-sellers have to borrow shares, from owners-managers or regular investors but the formers are not allowed by the lock-up period while the latter are not incentivized to lend shares. However, they can't borrow shares from other investors and short-selling becomes impossible. Instead, they would benefit from the presence of sentiment investors in the IPO.

Dorn (2009) using data on transaction undertaken by a large customer in the pre-IPO German market provides empirical evidence that supports the existence of sentiment investors in the market for IPOs. The transactions concern 91 IPOs on the Frankfurt Stock Exchange between August 1999 and May 2000. The author observes that sentiment investors participate at the pre-IPO market. When sentiments bid, they tend to pay a sizeable premium relative to prices in the immediate after-market. In addition, overpaid shares in the pre-IPO market experience a large demand by retail investors even in the early after-market. However, in the long-run these shares tend to under-perform in respect to both the whole market and the group of IPOs ignored by sentiment investors.

Prospect Theory and Mental Accounting

There is a theory in the literature explaining underpricing as the biases of decision makers in an issuing firm, rather than biases in the behaviour of investors. Loughran and Ritter (2002) try to explain underpricing in a way called prospect theory. They investigate why issuers don't get upset about leaving money on the table at the IPO and the result is the limited rationality of the mental accounting process that issuers adopt in recognizing gains and losses. The main point of this model is that in an IPO, issuers are subject to two opposed wealth changes. Underpricing is a wealth transfer from the issuers to new shareholders in two ways. First, given the large first-day returns, shares could have been sold at a higher price raising more money while the surplus goes directly to the investors. Second, it would have been possible to raise the same amount of money offering less shares and resulting in lower dilution for the pre-IPO shareholders.

Instead, the positive wealth change experienced by issuers happens when, after the appreciation of the shares in the first days, they become much richer thanks to the shares they retained because now are much more valuable. Before the IPO the retained shares' value was the offer price while after a couple of days of trading the shares they hold are now more valuable. Surely, the net wealth depends on the number of shares sold and retained at the IPO. According to Loughran and Ritter (2002) pre-IPO shareholders don't get upset about leaving the money on the table because they don't value the net-wealth change in a way completely rational. According to the prospect theory formed by Loughran and Ritter (2002), individuals tends to segregate the gains and to integrate the losses together. In case of a gain and a loss, individuals decide whether to integrate or to separate them taking into account their weight. Thus the pre-issue shareholders can feel good about the results from integrating the loss (underpricing and dilution) with the gain (increase value of retained shares).

Issuers are not perfectly rational. They would be much more resistant to severe underpricing if valued stand-alone and they would insist with the underwriter to reduce it. Nevertheless, since underpricing comes with the news of a wealth increase, they are less resistant to severe underpricing. Combining prospect theory-style with the notion of mental accounting (Thaler, 1980), Loughran and Ritter argue that issuers fail to get upset about leaving millions of dollars 'on the table' in the form of large first-day returns because they tend to sum the wealth loss due to underpricing with the wealth gain on retained shares as prices jump in the after-market and they may not end-up with the best outcome they could have achieved.

In this model underwriters can exploit the issuers mental accounting to increase the profit. Increasing the direct fees would make them reluctant to pay more. Instead, lowering the offer price and increasing the underpricing lead to a reduction in direct fees for the underwriter but could bring few benefits. First of all, marketing costs are reduced since it's easier to find potential buyers when the price is low. Second, investors would engage in a rent-seeking behaviour¹⁰ to increase their chances of being allocated underpriced stock. Doing so, investors might overpay commissions for other services to the same underwriter's increasing its revenue.

Evidently, increasing the direct fees is a more direct and transparent way to raise money for the underwriters. However, it's still an effective tool for underwriters to gain from an IPO given the lower transparency and the issuers limited mental accounting.

¹⁰ Rent-seeking is a concept that involves seeking to increase one's share of existing wealth without creating new wealth and reducing the economic efficiency. In this case investors to obtain more underpriced shares are willing to pay higher fees in different transactions to the same underwriter of the IPO. The total change in wealth is pareto inefficient and the loss for the issuer is higher than the gain of the investors.

Ljungqvist and Wilhelm (2005) use the structure suggested by Loughran and Ritter's (2002) behavioural perspective to test empirically whether the CEOs of recent IPO firms make subsequent decisions consistent with a behavioural measure of their perception of the IPO's outcome.

They analyse a sample of 1203 SEO occurred before September 2003 of firms went public in the U.S. between January 1993 and December 2000. Issuers' mental accounting and the prospect theory are hard to be tested empirically since they involve observation of behaviour and mental process of individuals. The use of proxies helps to overcome the problem and in this paper the proxy is based on the wealth changed by the CEO at the IPO. Ljungqvist and Wilhelm (2005) find that CEOs satisfied with the underwriter's performance at the IPO are more likely to hire the same underwriters to lead-manage later seasoned equity offerings. Instead, if they are not satisfied with the IPO's underwriter, they will more likely change it in a future SEO. In case of satisfaction, underwriters are able to extract higher fees in the future transactions.

Ljungqvist and Wilhelm (2005) provide evidence that individuals adopt a non-rational mental accounting process and explanatory power in the behavioural model exists.

2.3 - UNDERPRICING ACROSS COUNTRIES, SECTORS AND TIME PERIODS

Underpricing across various stock markets

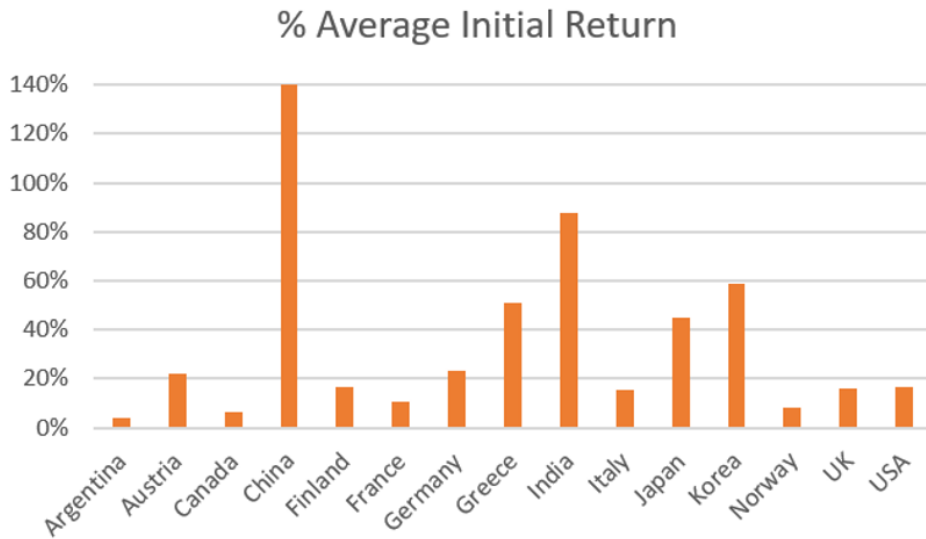
Underpricing issue is a phenomenon largely studied and analysed by the literature.

Despite differences in depth and breadth and even though most studies focus on the US stock market, empirical studies confirm the presence of underpricing also in every market examined.

Figure 3 reports the level of underpricing by country of listing highlighting the differences in the average of initial underpricing across countries.

In the Asian market underpricing it's higher than in more developed markets. According to Loughran, Ritter and Rydqvist (1994), China during the period 1990-2016 has experienced almost 145% of average underpricing while Malaysia 56,2%. In US average underpricing during the period 1960-2017 is way lower at 16,8% and in Canada 6,5 % during the period 1971-2017. In European countries, the average underpricing is high in Greece (50,8% from the period 1976-2013) while it's more limited in Germany with 23%, in Italy with 15,2 and in France with 15,2.

Figure 3 – Average Initial Return by country.



(Source: own illustration based on data from Loughran, Ritter et al. (1994))

The relevant cross-country differences might be explained by several factors. Institutional differences arise from binding regulations, contractual mechanism and specific characteristic of firms going public. Africa seems to lag behind respect to the rest of the world and the main causes are: the small size and the liquidity of stock markets the undeveloped states of capital markets even if in the recent times African countries started to introduce considerable changes in their political and economic systems. Nguema and Sentis (2006) try to explain the level of underpricing introducing the non-financial variable “country risk”. They demonstrate that those countries with the highest country risk have their financial market more prone to IPO underpricing.

Ritter (2003) investigates the reason of these differences in IPO underpricing across countries and one of them is the mechanism for pricing and allocating IPOs. This has been an interesting topic between the researchers who documented during the years the decline of the fixed price mechanism and auctions, and the growth of the book building (Sherman and Titman, 2002) (Ljungqvist, Jenkinson, and Wilhelm 2002). As dealt in the previous chapter, fixed price is a mechanism where the offer price is set relatively early before much information about the demand is known and this tends to result in a high level of underpricing (Loughran, Ritter and Rydqvist 1994).

Some governments regulate the offering price of shares. This is sometimes viewed as the reason why some countries see abnormally large returns on their IPOs. The Securities and Exchange Commission in the US is more concerned about companies' full disclosure than their 'fairness', so they do not set a regulatory price. An example of a country that uses regulation is Japan. Before the reform in 1989, Japanese firms were required to have offer prices based upon the multiples of three comparable companies. In practice this does not work as it does not account for a company's potential growth, and companies with low multiples may have been chosen as the comparison (Ibbotson and Ritter, 1995).

Underpricing in different sectors

Other studies argue whether underpricing varies in different economic sectors. Lowry and Schewert (2002) demonstrate that high tech companies are more underpriced than low tech companies and also that non-technology firms have the lowest level of underpricing.

Loughran and Ritter (2004) analyse a sample of 6,391 IPOs conducted in the period from 1980 to 2003 support the thesis above. Indeed they find that tech companies are characterised by higher initial return than non-technology firms. During the dot.com bubble the average level of underpricing was much higher than for other firms (almost 80% and 23% respectively) but even before the bubble tech firms were characterised by higher first day return. The reason behind this result is that high tech industry is still young and technological companies are characterised by higher risks. Having loads of intangible assets doesn't help investors to evaluate the growth possibilities and this increase the information asymmetries between firm's owner and potential investors leading to a higher underpricing.

Other reasons for underpricing

Loughran and Ritter (2002) argue that the reasons why IPOs are underpriced depend on the environment. They thought that the winner's curse was the best explanation for the 1980s in the US, but that during the Internet bubble in the 1990s, this was not the main reason. Instead they found that other alternatives such as analyst coverage, side payments to CEO's and venture capitalists are better explanations.

Banerjee et al. (2011) sustain that analyst coverage¹¹ is a good proxy for information asymmetry and they find significant results related with underpricing. The reason why analysts are important is that issuing firms place great importance on favourable analyst coverage once they are public. They rate the analyst coverage on a scale from 1 to 10 where 1

¹¹ Analyst coverage is intended as the amount of coverage by analysts for an IPO in a country.

means the lowest coverage and lack of attention. China scores relatively low (3) compared with US (6) while the highest score is captured by Hong Kong with 9. The results are quite in line with the results seen before where China has one of the highest average first day return.

A difference between U.S. and Europe is that class action lawsuits are common in the U.S. but rare in Europe. In U.S. several law firms specialize in suing corporations and to overcome the problem almost all publicly traded companies pay a sort of insurance to minimize the impact if they are successfully sued. Van der Goot (2003) argues that legal risk is one of the reasons that higher quality underwriters are less likely to take riskier companies public in the Netherlands.

Information regarding the identity of individual shareholders might communicate to investors the quality of a firm. One type of ownership that is relevant for investors' assessment purposes is the one of venture-capital firms. Venture capitalists are investors who try to add value through ongoing longer-term involvement with continuing business development. The venture capitalists are usually directly involved in the management of the firm and often serve on the company's board of directors.

It is common that venture capitalists are specialized in one industry and uses this position to develop relationships for the company they are involved with. Next to that, venture capital often provides capital for the firm. In the literature we find disagreement about the role of venture capital during an IPO.

Barry, Muscarella, Peavy, and Vetstuypens (1990) show that IPOs backed by venture capital are less underpriced than IPOs that are not backed by venture capital, whereas Gompers (1996) and Loughran and Ritter (2004) find that venture capital is positively related to IPO underpricing.

Barry et al. (1990) show lead venture capital are incentivized to not underprice since on average they hold 19% of the stake of the company while Gompers (1996) offers are more underpriced with the presence of venture capitalists. He sustains that venture capitalists are eager to build up a reputation by rushing private firms public. By rapidly bringing private firms public, they show their ability to launch successful IPOs and secure future funding. However, this led to an increase in the amount of underpricing associated with the issues because younger firms are less established and riskier than the older ones.

Furthermore, Loughran and Ritter (2004) state that the age has to be taken into account while studying underpricing. A younger firm is associated with a higher risk, because the value of

the firm is less evident than a firm that is founded decades ago and has proven itself for many years (Ibbotson, 1988). Next to that Chalk & Peavy (1990) state that larger IPOs are generally less underpriced.

The size can also be a factor influencing the initial return according to Chalk & Peavy (1990) who sustain that larger IPOs are generally less underpriced.

The long-run results of initial public offerings

Literature has focused its attention not only on short-run underpricing and the so called “hot issue markets” but also on the long-term performance of the initial public offerings

Ritter (1991) provides evidence of this phenomenon analysing a sample of 1526 during 1967-87. He documented that newly listed companies substantially underperformed a set of seasoned firms matched by size and industry in stock returns for the first three years subsequent to listing. He was the first to document the long-run underperformance anomaly in IPO literature. Following Ritter (1991), Loughran (1993) examined the returns from 3,556 IPOs during 1967-1987 and found an average six years total return of 17.29% compared with 76.23% for the NASDAQ index during an identical period. The results were however worse than those of Ritter for his three years tests.

Loughran and Ritter (1995) examined the stock returns of 4,753 initial public offerings and 3,702 SEOs offered during 1970 to 1990 reporting that the 3 and 5 year buy-and-hold returns for IPOs in the post-issue period were 26.9% and 50.7% less than size-matched non-issuing firm respectively. Consistent with Loughran and Ritter (1995), Spiess and Affleck- Graves (1995) also reported that seasoned issuers underperform their industry peers matched by size. The underperformance phenomenon is not limited to the United States only. Uhler (1988) found an underperformance of 7.4% after one year for German issues during 1977-1987. Finn & Higham's (1988) examined 93 Australian IPO's issued during 1966-1978. They found that buying at the end of the month of listing and holding to the end of the first year earned 6.52% below the indices, but the loss was not statistically significant.

Levis (1993) conducts a similar study in UK. He finds that in the period 1980-1988 there is significant underperformance in the first 3 years after becoming public. Especially, firms with the highest initial returns perform worse than firms with more limited first day return.

Aggarwal, Leal, and Hernandez (1993) reported three-year market adjusted returns of 47.0%, 19.6% and 23.7% for Brazil, Mexico, and Chile, respectively.

Underperformance of IPOs was also confirmed in Australia. Lee, Taylor and Walter (1996) analysed both initial under-pricing and post-listing returns for Australian new issues. The

results showed that Australian new issues significantly under-performed market movements in the three-year period subsequent to listing.

CHAPTER 3 – 2010-2019 U.S. IPO MARKET AND TECH IPOs

3.1 - U.S. STOCK MARKET TRENDS

Before going deeply into the U.S. IPO market, a review of the two most important stock market indexes like S&P 500 and NASDAQ-composite is useful to understand where the whole economy is going, at which point of the cycle the economy is and the confidence of the investors. The S&P 500 is considered the best representation of the U.S. stock market and is composed by the 500 largest companies listed on the stock exchanges in the United States in term of market capitalization.

The scientific literature during the years found evidence that market timing of an IPO is also influenced by favourable conditions of the market. Baker and Wurgler (2002) and Lowry (2003), sustain that high market yield and investor confidence influence the management's decision to go public. Lerner et al. (2003) showed only companies who are in a desperate need of cash project an IPO if the market conditions are not favourable. Indeed, having the best market conditions is the most important factor for Ritter and Welch (2002) in the process of deciding to launch an IPO. The authors indeed found that IPO volumes decrease rapidly in bear markets discouraging companies to launch their IPOs encouraging the management to wait.

S&P 500 in 10 years it has increased by 178% going from 1168,25 at the beginning of 2010 to 3245,30 at the end of 2019. As you can see from the Figure 4, the general trend has been positive with a consistent drop at the end of the 2018, making the annual return for 2019 of 29.3% the biggest in the last 10 years.

With a focus on the path of 2019, we can see a drop in May and between the period August-September quickly recovered during the following months.

Figure 4- S&P 500 performances. 2010-2019 performance on the left. 2019 performance on the right.



(Source: own illustration based on Yahoo Finance data).

The second important index is the NASDAQ-composite since its composition is heavily weighted towards information technology companies.

Figure 5 -NASDAQ Composite performances. 2010-2019 performance on the left. 2019 performance on the right.



(Source: Yahoo Finance).

With a 10 year focus it's possible to note the path has been pretty similar compared to the S&P 500 with a drop at the end of the 2018. Looking at the performance of 2019 instead, the slightly drops appear, as in the case of the S&P 500, in May and in August-September. The annual return for 2019 is the highest since last 10 years, with an increase of more than 35%.

In general, stock market grew according to both indexes not being affected by the trade tension between China and the United states and the uncertainty in policy, while the whole automotive sector as a standalone has suffered the high tariffs imposed. According to historical growth and last year growth, even with macroeconomic tension, it appears that there are favourable conditions for companies who want to go public.

3.2 – U.S. IPOs MARKET

This paragraph investigates the IPO market in the period 2010-2019. Data on IPOs are taken from two sources: the data until the end of 2018 come from the database of the professor Jay Ritter¹², who has spent his career tracking the emergence of new public companies earning the moniker of “Mr. IPO”; for the 2019 instead, data are retrieved from “IPOScoop.com”.¹³For both databases offers with a price below \$5 have been excluded. Most of the existing literature has always appointed its attention on the period before the bubble and a lot of studies have been made trying to have a better understanding on the behaviour of tech IPOs. The definition of tech stocks given by Ritter helps to distinguish which companies are

¹² “2018 IPO Underpricing and earlier years” available on Jay R. Ritter’s website. See https://site.warrington.ufl.edu/ritter/files/2019/03/IPOs2018_Underpricing.pdf [Accessed 10 December 2019].

¹³ “2019 Pricings”. Available here: <https://www.iposcoop.com/current-year-pricings/> [Accessed 6 January 2020]

included in the sample. He defines tech companies as “internet-related stocks plus other technology stocks, not including biotech”. For instance, social media companies are considered tech stock because internet is crucial to run the business and it’s necessary to develop their business models. In the past, some of the most important authors like Loughran and Ritter (2002), Lowry and Schwert (2002), Giudici and Rosenboom (2002) demonstrated that tech and Internet IPOs are more underpriced than non-tech and non-internet IPOs.

Internet companies have been found more underpriced respect other companies also by Karlis (2008). The younger age of these companies signals higher risk who translates in more underpricing. In Europe, Bomans (2009) found proof sustaining the theory of higher underpricing for firm who base their success on technology. Bomans studied the underpricing with variables such as offer price, issue size, underwriter reputation and industry and found that in his model only industry and offer price were the significant variables.

Since 2010 the IPO market registered 1285 companies that listed their shares on the US stock exchanges. Figure 6 illustrates the average first day return and the number of IPOs during the period of the analysis. The peak has been reached in 2014 with 225 IPOs and the trend from 2016 started to become positive again. Having a look on the initial return analysis, in the last year the average initial return is almost in line with the past two years around 19,37%, slightly above the average of the last ten years of 15,88%. The worst year for the IPOs initial return has been the 2010 with 9,20%, just after the crisis when investors were more conservative and sceptical about their investments.

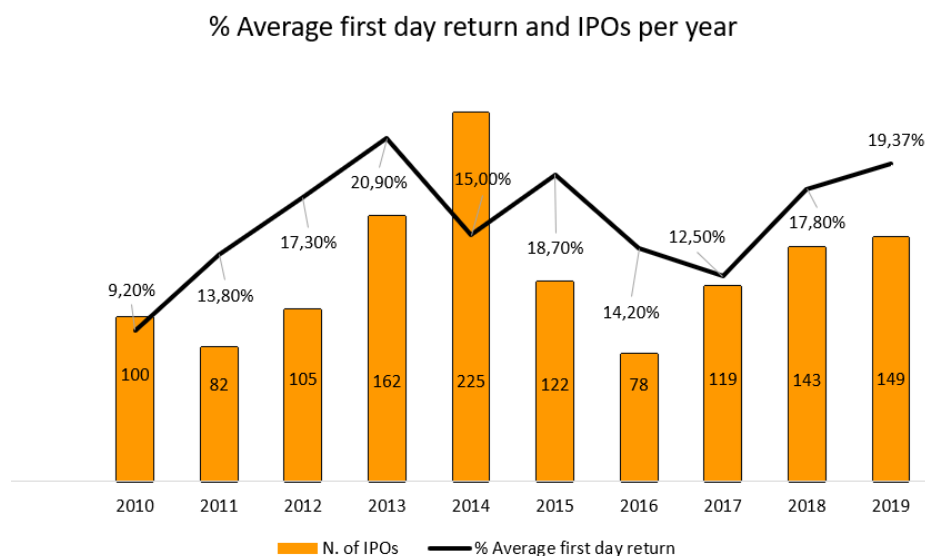
The degree of underpricing and IPO volume are somehow cyclical. There have been periods with low volume of offerings like 2011 and 2016 with respectively 82 and 78 companies went public and periods like 2014 with 225 companies who offered their shares to the public. Same reasoning is done for the level of underpricing who is not always the same: crisis periods are negative related with first day return.

Literature in the past found results in line with these ones. Indeed Ibbotson and Jaffe (1975) and Ibbotson (1994) demonstrated that there are periods where high volume of offerings have been related to high first day return (“hot issue” market) and periods with low volume of offering have been related to low first day return (“cold issue” market).

Helwege & Liang, (2004) found that IPOs issued during periods with high volume of new listings were significantly more underpriced compared to firms issued in periods with fewer IPOs. One of the reasons of this cyclicity for Ritter (1991) is that companies try to lower their cost of capital by timing the market. Coherent with that Baker and Wurgler (2002)

showed that companies prefer to raise equity capital instead of debt in markets with high valuation and when investors are too enthusiastic about earnings expectations.

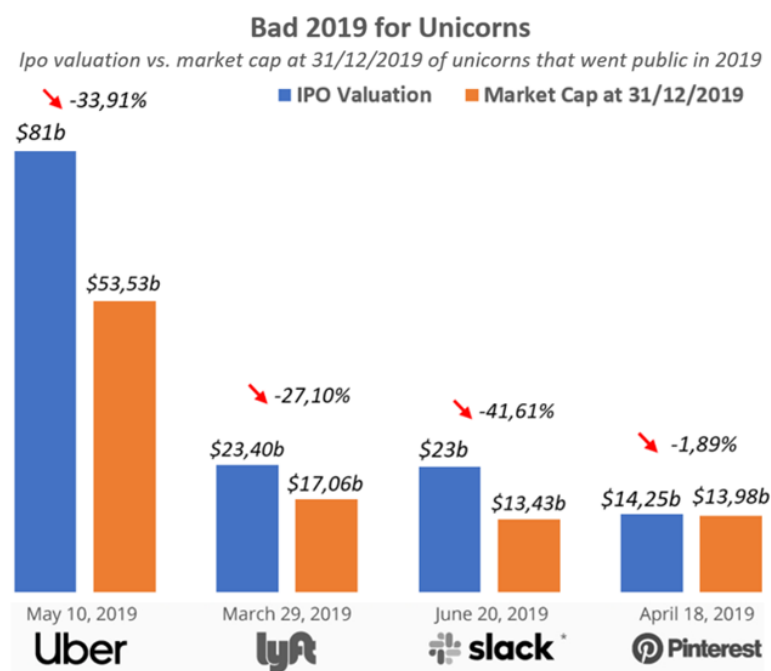
Figure 6 – Average first day return and number of IPOs during the period 2010-2019.



(Source: own illustration based on the database of Jay Ritter and IPOscoop.com)

The actual market situation seems then favourable for companies who want to go public, in fact 2019 was a historic year for IPOs, in a good and in a bad way. Many appetizing Silicon Valley’s names went public including Uber, Lyft, Slack and Pinterest. One of the most hyped, WeWork, failed in very impressive manner, seeing a \$47 billion valuation shattered down before cancelling its deal. But some of them have performed well: CrowdStrike, The RealReal, Cloudflare, Peloton and Bill.com represent the broader wave of tech-driven start-ups that succeeded in their public offerings. Figure 7 show the market capitalization drop from the IPO date until the end of 2019 for the most hyped IPOs such as the two ride-hailing companies Uber and Lyft, the platform Slack and the social network Pinterest. Uber lost almost \$30 billion of market capitalization since its IPO in May, Lyft 27,10%, slack even more while Pinterest is still around its IPO value.

Figure 7 – 2019 performance of unicorns went public in the same year.



(Source: own illustration based on Yahoo Finance data).

Not only the ride-sharing disruptive business faced for the first time the public market, the alternative protein business of Beyond Meat shown the best performance for companies who raised around \$200 million since the dot.com bubble.

The share price initially announced at \$25 started to trade at \$46 and in 3 months reached the value of \$235 before finding the value in the range between \$70 and \$85. That said, 2019 proved that public market investors are different from venture capitalists, and despite the high private valuations, the public market is still sceptical and reluctant to remunerate risky companies just because in private they have received high valuations.

3.3 - 2019 IPOs

To describe 2019 IPOs I used several variables explained in Table 1. In the descriptive analysis reported in the following paragraphs, IPO first-day return (also called “Initial Return”) is calculated as the percentage difference between the offer price and the first day closing price. IPOs are correctly priced when there is no difference between the offer price and the first day closing price while IPOs are underpriced when stocks show a positive return that is the offer price is lower than the first day closing price.

The aim of the graphs reported, and the statistics presented, have the purpose of providing a summary of the data that can be useful to highlight the principal characteristics of 2019 IPOs and the potential relationships between the level of underpricing and the other variables

analysed. The analysis also illustrates which are the most important differences between the IPO of Uber and the other tech IPOs. Therefore, I will compare the IPO of Uber with the IPO of its main competitor Lyft, to see similarities and differences in many aspects.

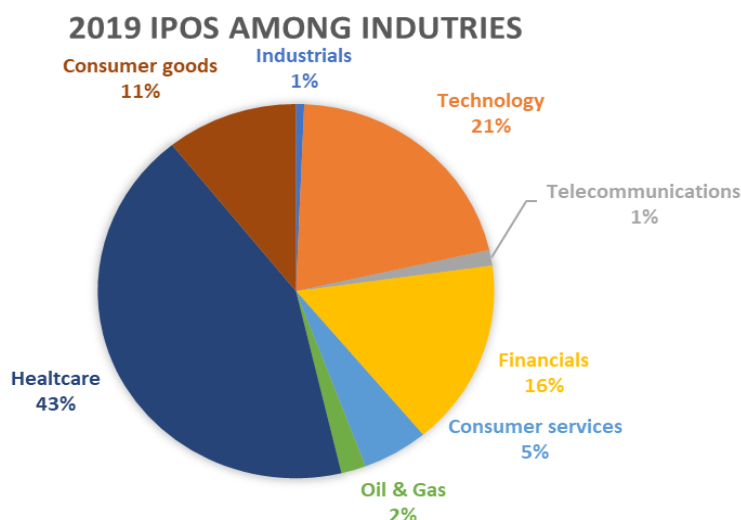
The variables taken into account for the 2019 IPOs descriptive analysis are resumed in Table 1:

Table 1 – Variables utilized for the descriptive analysis of 2019 IPOs

Initial Return (IPO first-day return)	The IPO raw initial return calculated as the % difference between the offer price and the first-day closing price.
Age of the Company	Number of years the company has operated before its IPO.
Market Capitalization	The product between the final offer price and the number of shares outstanding at the time of the IPO.
Offer Price	The price paid to acquire each share.
Industry	The sector in which the company operates.

The sample consists of 149 US IPOs happened in the 2019 divided by industry and reports an average initial return, calculated as the percentage change from the offer price to the closing price on the first day, of 19,37%. Figure 7 shows that the most popular sector is the health care sector with 64 entities representing the 43% of the total sample. The tech sector (which includes Uber and Lyft) counts for 21% with 31 entities and the third biggest industry is covered by the financial sector with 16% of the total and 24 entities.

Figure 7 – 2019 IPOs among industries.



(Source: own illustration based on sample data).

Table 2 shows that the most volatile sector for the first day regards the Consumer Goods companies, with an average underpricing of 37,12%. The Average first day return of the category is mainly due to companies such as the surprising Beyond Meat, Revolve Group, a luxury e-commerce platform for millennials who got almost 89% the first day and Chewy, an online retailer for pet food and products who shown almost 60% of first day return. Tech IPOs follow roughly the same path with an average first day underpricing of 25,92%, including in the statistic Uber who got -7,52 % and Lyft with 8,74%.

Consumer services has the lowest positive first day volatility while the overpricing in Industrial is not significant due to the fact that the sample includes only one entity.

Table 2 – 2019 U.S. IPOs divided by industry and first day average underpricing.

INDUSTRY	N. OF IPOs	1 st DAY AVG UNDERPRICING
Consumer Goods	16	37,12%
Consumer Services	8	0,40%
Financials	24	13,36%
Health Care	64	18,34%
Industrials	1	-3,12%
Oil & Gas	3	4,66%
Technology	31	25,92%
Telecommunications	2	-9,63%
Tot	149	19,37%

(Source: own illustration based on sample data).

As it is possible to note looking at Table 3, from the 149 companies went public, 99 of them were underpriced, 42 overpriced and 8 correctly priced. For the overpriced companies, the average negative initial return was -11,92% and the worst first day performance was experienced by Ruhnn Holding Ltd, the China leader internet facilitator with -37,20% of initial return. Underpriced companies instead, experiences a first day return of 34,21% and the best first day performance was shown by Monopar Therapeutics' title with a jump of 231,25% after the first day of trading. It's also worth to note that, since the median values are lower than the mean values, the distribution of them is slightly located to the right, toward high values.

Table 3- Statistic description of the sample.

	OVERPRICED	UNDERPRICED	CORRECTLY PRICED	TOTAL
N. OF COMPANIES	42	99	8	149
% OF TOTAL	28%	66%	5%	100%
MEAN I.R.	-11,92%	34,21%	0	19,37%
MEDIAN I.R.	-8,61%	27,63%	0	11,37%
MAX/MIN	-37,20%	231,25%	-	-

(Source: own illustration based on sample data).

Table 4- Statistic description of the sample.

	OVERPRICED	UNDERPRICED	CORRECTLY PRICED	TOTAL
MEAN OFFER PRICE	\$14,92	\$17,65	\$13,31	\$16,64
MEAN MARKET CAPITALIZATION	\$3461	\$3035	\$1955	\$3097
MEDIAN MARKET CAPITALIZATION	\$810	\$1422	\$810	\$1200

(Source: own illustration based on sample data).

Table 4 reports some of the most important characteristics of the IPOs. The mean offer price for 2019 IPOs in the sample is \$16,64 and the mean market capitalization is \$3 billion. As for the first day return, here the median market capitalization is way lower than the median, meaning that the mean is influenced by a relative amount of high values.

Indeed, in the sample, there are some important firms, like Uber, Lyft, Pinterest, Chewy and Avantor which had a market capitalization above \$10 billion (Uber had 81 billion) at the time of the IPO and clearly it increases the average market capitalization of the sample.

The mean offer price is slightly different between underpriced, overpriced and correctly priced IPOs. Correctly priced IPOs are, on average, smaller in term of market capitalization respect the underpriced and overpriced firms, indeed at the time of listing they present the average market cap is \$1 bn lower respect the overpriced and underpriced firms.

Table 5 – Average internal return divided by market capitalization.

	<0,5 BN MARKET CAP	0,5 – 1 BN MARKET CAP	1-2,5 BN MARKET CAP	2,5-10 BN MARKET CAP	>10 BN MARKET CAP
N. OF COMPANIES	22	44	46	27	10
AVG MARKET CAP	\$279	\$757	\$1560	\$4546	\$22729
AVG I.R.	16,26%	9,11%	25,83%	30,75%	11,38%

(Source: own illustration based on data sample)

In the literature, size of the firm has mostly been negatively associated with its risk. Finkle (1998) stated that larger firms have better access to investment capital, have more diversified product lines, and those factors reduce uncertainty around the IPO (Bhabra and Pettway 2003). This inverse relation between firm size and risk have been empirically proved by authors like Ibbotson et al., (1994) or Carter et al., (1998).

In Table 5 I divided the companies in 5 groups to see what the level of underpricing in the sample is. It's possible to see that, in contrast with the literature, underpricing is not directly related to underpricing. In fact, firms between the ranges "1-2,5 billion" and "2,5-10 billion" are the most underpriced compared to the firms in the other ranges. Moreover, companies with a market capitalization between 0,5 and 1 billion experienced the lowest average underpricing of 9,11% and firms included in the range "2,5-10 billion" appears to be the highest underpriced ones. Lyft with an Initial return of 8,74 % is almost in line the Initial return of its category of 11,38% while Uber appears to take the opposite path, with an initial return of -7,42% which is highly in contrast with the average of its category and the rest of companies who faced the public market.

Table 6 – Average internal return divided for companies with more than \$10 bn of market capitalization.

COMPANIES WITH MARKET CAP >10 bn	MEAN I.R.	MEDIAN I.R.	MEAN OFFER PRICE
UBER	-7,62%	-	\$45,00
LYFT	8,74%	-	\$72,00
OTHERS 8 (UBER AND LYFT EXCLUDED)	14,09%	15,41%	22,63

(Source: own illustration based on data sample)

Offer price in an IPO may have multiple meanings. If firms want to attract retail investors, they set a low price to stimulate excessive demand from small investors, which systematically leads to underprice. Gompers and Metrick (1998) in contrast found that firms looking to attract institutional investors usually set high offer prices. In support, Ibbotson et al., (1988) found empirically evidence that firms who went public with low prices registered high levels of underpricing. Fernando et al (1999) said that low priced offers experience higher risk and are subject to speculative trading, reporting a U-Shaped association.

Table 6 shows the relevant differences between Uber’s IPO and 2019 IPOs with market capitalization bigger than \$10 billion. The first thing that is possible to note is the negative first day return of Uber’s stock (-7,62%) respect to its main competitor in the US market Lyft with 8,74% and the rest of the companies (14,09%). Indeed, Uber stocks remarkably underperformed compared to the others. Furthermore, among the companies with a market capitalization higher than \$10 billion, the offer price of Uber was more than double the average price of the rest of the sample, while for Lyft is even higher: three times above the average.

Regarding the age of the companies, the literature found a negative relation between the age and the level of underpricing. Ritter (1984,1991) sustained that the two main reason of this negative relationship are the following: first of all the younger the firm is, the higher the ex-ante uncertainty because the market (mainly financial analysts) is less likely to follow young companies. Second, information asymmetry is always a crucial point and information on young firms on operating activities or financial data are not available or not present long enough to compare them. This results in more underpricing.

Table 7 – Median and Mean company age at their IPO.

	OVERPRICED	UNDERPRICED	CORRECTLY PRICED
MEAN COMPANY AGE	12,19	15,03	5,75
MEDIAN COMPANY AGE	7,50	9,00	6,00
UBER	11	-	-
LYFT	-	13	-

(Source: own illustration based on data sample)

Table 7 presents the median and the mean age of the companies in the sample divided by overpriced, underpriced and correctly priced. Firms who experienced underpricing were slightly older than firms overpriced, as the average age of companies underpriced is 15 compared to the ones overpriced of 12,19. Instead, correctly priced firms had an average age of 5,75, about half of the age of the other companies wrong priced. Correctly priced companies are younger on average than mispriced companies. This result goes in contrast with most of the literature in this field mainly because one year of analysis is not enough to draw conclusion, literature's sample take into account data for longer periods and the potential one-year volatility of some variables is smoothed through the length of the period. Uber, as an overpriced firm, is in line with the average of its group with 11 years, same for the underpriced Lyft with 13 years of activity.

Table 8 – Underpriced and Overpriced IPOs divided by age.

	0-5 YEARS	6-10 YEARS	>10 YEARS
OVERPRICED FIRMS	14	13	15
MEAN I.R OVERPRICED	-14,32%	-10,86%	-11,49%
UNDERPRICED FIRMS	29	30	40
MEAN I.R UNDERPRICED	19,55%	56,93%	27,81%

(Source: own illustration based on data sample).

In Table 8, IPOs are divided by age of the companies at the time of the listing in 3 categories. Firms are segmented on the basis of their age at the time of going public, computed as the year of the offer minus the year of founding. The first category includes IPOs executed by young firms with 5 years of activity or less, the second category includes IPOs executed by firms with a period of activity between 6 and 10 years and the third one includes mature companies went public with more than 10 years of activity.

It is possible to observe that there are important differences between the three categories. As already stated above, the results from this table are in contrast with the results found by Ritter (1991) since it's not possible to find a monotone pattern with age of the companies and underpricing. Indeed, the highest underpricing was shown by the category 6-10 with an initial return of 56,93%. The statistic is slightly influenced by firms such as BeyondMeat and Monopar Therapeutics. Excluding these two firms from the sample the underpricing of 6-10 years old firms would have been 46,92%, still way bigger than the other categories.

For what concerns overpriced firms, the amount of companies went public is almost the same in the three categories and the initial return is line with themselves.

Focusing on tech IPOs with Table 9, it's possible to note that 2019 have been a poor year in terms of tech IPOs with only 21% of the total compared to 29% the year before. The 2019 median age of tech stock of 10 years is quite in line with the past, while regarding the profitability, the pattern in the past hasn't been regular, 64% of tech companies in 2010 were already profitable, the year after only 26%. Despite a 2019 level of underpricing similar to the year before, what has been different is that 35% of them were already profitable meaning that latest financial statement prior the IPO presented a positive income, more than double respect the year before.

Table 9 – 10 years of US IPOs and comparison with tech stocks.

YEAR	N. OF IPOs	% Average first day return	% of tech stock	median age (of tech stocks)	% of tech stock profitable
2010	100	9,20%	36%	11	64%
2011	82	13,80%	44%	10	26%
2012	105	17,30%	42%	9	44%
2013	162	20,90%	27%	9	28%
2014	225	15,00%	26%	11	17%
2015	122	18,70%	32%	11	26%
2016	78	14,20%	28%	10	29%
2017	119	12,50%	28%	13	17%
2018	143	17,80%	29%	12	16%
2019	149	19,37%	21%	10	35%

(Source: own illustration based on data sample).

Having a look only on 2019 tech IPOs, in Table 10 they are divided between profitable and unprofitable and it's calculated the average of: initial return, age, offer price and market capitalization. The main differences from the two categories are related to the market capitalization, the age and the average initial return. Indeed, tech profitable companies are on average 5 years older than the ones unprofitable, and have a market capitalization of almost 10 billion, which is two times the market capitalization of unprofitable tech companies. Even the average initial return is quite different between the two: profitable ones showed 13,06% of initial return while unprofitable firms on average experienced almost 33% of underpricing. Uber is part of the profitable ones since it closed 2018 with positive net earnings while Lyft is included in the “unprofitable” category.

Table 10 – 2019 tech IPOs divided by profitability.

	N. OF IPOS	AVG I.R	AVG AGE	AVG OFFER PRICE	AVG MKT CAP
PROFITABLE	11	13,06%	15	18,94	9834
UNPROFITABLE	20	32,99%	10	20,37	4440

(Source: own illustration based on data sample)

CHAPTER 4 - THE UBER IPO CASE

4.1 - SHARING ECONOMY AND RIDE-SHARING SECTOR

The term “Sharing Economy” emerged in the U.S. scene in 2008 denoted as the “collaborative consumption made by the activities of sharing, exchanging, and rental of resources without owning the goods.”

Collaborative consumption was first coined by economists Marcus Felson and Joe Spaeth back in 1978 and it’s based on the idea that there is considerable excessive capacity in the assets held by ordinary households (cars, rooms, and durable goods) and it’s necessary to create a new type of market that allows people to rent or share those assets with other people.

Today, without ever taking out their wallets, individuals with smartphones can locate and unlock a bicycle for their trip to work, and upon arrival, they can return the bicycle to a designated new location and only pay for the specific amount of time used. This is one example of the micro-scale reach of the sharing economy, a 21st century phenomenon that has established a new global economic system so ubiquitous that it has been compared to the Industrial Revolution for its profound impact on the economy, society, and culture of the world.

A combination of four forces over the past several years has helped the creation and accelerated the adoption of the sharing economy: new technological advancements, the recent national and global economic conditions, the greater public awareness of the deterioration of the environment, and a growing need for community engagement.

Technology is clearly the most important factor helping the acceleration and the adoption of the sharing economy. The combined use of mobile and GPS enabled devices, online payment platforms, and social networks contribute to the ease of conducting transactions and building trust. Without advancements in technology, many of these underutilized assets would not be available in the marketplace on a scale that made the sharing economy possible.

Mobile devices drastically increase the ability of customers to rapidly access sharing platforms and locate desired goods or services through GPS. For several new sharing economy platforms, such as ride-sharing Uber and Lyft, the platform is only accessible through their mobile applications.

Online payment systems also play a critical role by facilitating payments in the sharing economy. In many transactions, the seller and the buyer do not meet personally. The use of efficient online payment platforms has broad appeal to both buyers and sellers. The ability to

streamline the process to engage in sharing economy transactions increases the level of convenience and allows users to participate more frequently.

For many users, the sharing economy can help incentivize a possession reduced lifestyle by minimizing the need to own certain goods. Over the last half century, Americans have placed a high value on personal ownership, which has become a marker for personal economic success: personal wealth is typically judged, at least on the surface, by what type of home, car, or clothes a person owns.

However, ownership of assets requires large capital expenditures, maintenance costs, and sometimes storage and disposal costs. When individuals can obtain on-demand and instantaneous access to a variety of goods without significant expenditures, the appeal of ownership is reduced.

More specifically, it has been estimated that individuals who use car-sharing services such as ZipCar instead of owning a car saved \$500 a month on average. Furthermore, because of the reduced costs associated with access, as opposed to ownership, users of the sharing economy may be able to use goods superior to those they would have purchased without such access. Hence, the ability of participants to avoid the cost of ownership has become an attractive alternative to ownership, especially given the current unstable national and global economic conditions. Beyond reducing the burden of ownership, sharing economy models also create more opportunities for additional earnings. Individuals in financial need can make money on their underutilized assets already purchased by accessing those platforms. A study performed by Airbnb asserted that homeowners using their platform had the possibility to make \$6,900 and \$9,300 per year according to the amount of space they offered.

The obstacles

Many aspects of the sharing economy have aligned with current economic and societal trends accelerating its adoption, nevertheless the sharing economy still faces a significant number of obstacles. Established businesses feel that their sharing economy competitors are not competing on the same field of work and they might create obstacles by pressing for laws and regulations to restrict sharing economy activities.

Laws and Regulations

The sharing economy is still evolving, but its disruptive nature for many industries has affected some business owners. A major obstacle is the traditional policies and regulations associated with established industries.

The most common are the many permits and licenses, such as taxi permits and hotel licenses, required of traditional businesses.

More specifically, Uber, Lyft, and other ride-sharing businesses have encountered aggressive resistance from taxi companies in most major cities. The taxi companies insist that ride-sharing businesses bypass the established transportation regulations and licensing costs. In San Jose, California, a potential taxi driver must pass a written test, a drug test, and pay \$464 in fees. Companies operating taxis, and the drivers themselves, must also have business licenses while Uber and Lyft drivers do not have to pass the same tests or pay the same fees as taxi drivers.

The threat of the sharing economy to established industries activates political and lobbying efforts to create barriers to entry and regulatory obstacles.

As sharing economy models continue to grow and obtain the market share of incumbent competitors, the issue of regulatory fairness is becoming a critical factor in the growth of the sharing economy.

Trust

One of the most important pillars to attract participants in the sharing economy is trust. In a TED talk, Rachel Botsman, the guru of the sharing economy, speaks of three trust waves our society has faced with the internet. The first one was when people become comfortable with sharing information online, thanks also to the rise of social networks. The second wave involved trusting the online payment systems used in the e-commerce. The third one is connecting to trustworthy strangers online.

“The rise of multi-billion-dollar companies such as Airbnb and Uber, whose success depends on trust between strangers, is a clear illustration of how trust can now travel through networks and marketplaces” (Botsman, 2017).

Higher the participation rate for an industry, easier is the change in customers’ behaviour and trust and governance model have to evolve with these changes.

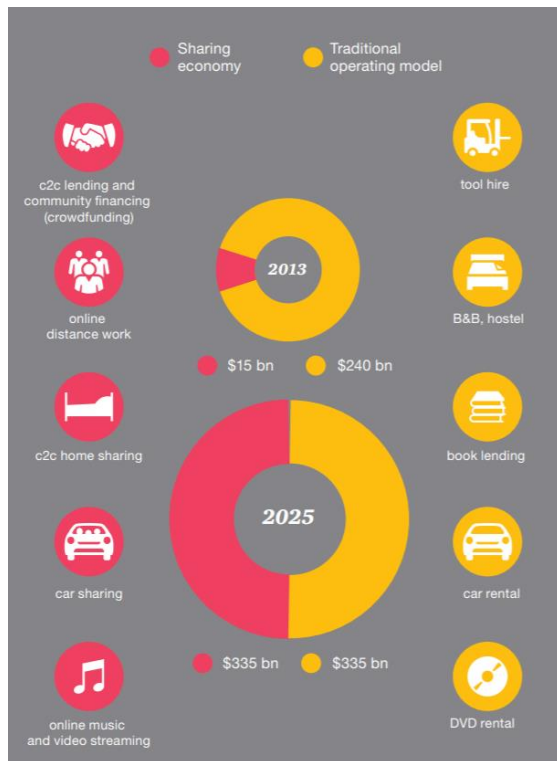
The sharing economy platforms which will be able to answer those needs effectively, will succeed.

In a survey conducted in June 2019 by Statista¹⁴ with 1000 U.S people on the trustworthiness of sharing economy services, 14% of the population considers “very trustworthy” those

¹⁴ E. Mazareanu. Trustworthiness of sharing economy services in the U.S. retrieved from Statista at <https://www.statista.com/statistics/875137/trustworthiness-of-sharing-economy-services-in-the-united-states/> [Accessed 10 December 2019]

services and 44% “somewhat trustworthy” while the rest 42% is divided between “not very trustworthy” and “not at all trustworthy”.

Figure 8 – Sharing economy forecast. (Source: PwC: Sharing or paring?Growth of the sharing economy).



Potential of the sharing economy: numbers

The growth of sharing economy surprised even optimistic market experts. In the early stage of its life, in 2009, there were only few actors: Zipcar, BlaBlaCar and Couchsurfing among them. Airbnb had launched in fall 2008, Uber in spring 2009. “Access over ownership” broke the traditional paradigm, thanks also to the technologies who make easier the access to those on-demand services.

In only a few short years, the sharing economy has become a ubiquitous concept. While still in its infancy, the sharing economy has disrupted a

number of industries with lightning speed. Any industry could potentially benefit from, or be disrupted by, the rise of collaborative consumption and the proliferation of asset-sharing models. However, due to its natural fragmentation and asset intensity, the sharing economy is especially relevant to core transportation companies as well as to heavy users of transportation services. Figure 8 summarizes the potential of the sharing economy according to PwC’s¹⁵ projections in the dossier called “Sharing or paring? Growth of the sharing economy”. Projections show that five key sharing sectors—travel, car sharing, finance, staffing, and music and video streaming—have the potential to increase global revenues from roughly \$15 billion in 2013 to around \$335 billion by 2025.

What’s new here is that lack of overhead expenses and inventory help share-based businesses run lean and increase the efficiency. Clearly, traditional businesses have to adapt otherwise they will sink.

¹⁵ PriceWaterhouseCoopers Magyarország Kft; 2015. *Sharing or paring? Growth of the sharing economy* retrieved from < <https://www.pwc.com/hu/en/kiadvanyok/assets/pdf/sharing-economy-en.pdf>> [Accessed 1 December 2019]

According to a survey made by McKinsey¹⁶ in 2016 20-30% of people in US receive a stream of revenue through sharing platforms, either as workforce or passive income.

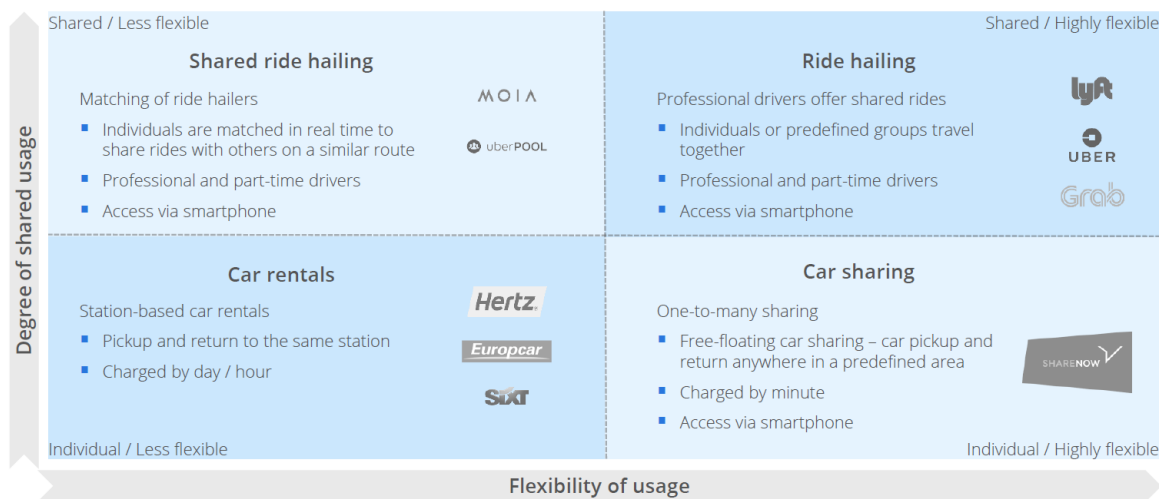
In 2016 44.8 million U.S adults used the sharing economy platforms and this number is predicted to increase to 86.5 million in 2021.

4.1.2 – Online mobility services and ride-hailing sector.

Online mobility services allow customers to choose their travel experience between a wide range of providers. Booking over the internet has already become the norm for many mobility services and this allows companies such as Uber and Flixbus to offer innovative solutions. Online mobility services include five main segments: flights, ride hailing, car rentals, train tickets and bus tickets. Currently, the U.S. market is the biggest in terms of revenues with US\$ 158.3 billion in 2018 and the fastest-growing segment is the ride hailing with an average annual growth rate of 14,8% estimated for the period 2019-2023.

Compared to the U.S. and China, the ride hailing market in Europe is rather small, which is due to legal regulations and a high prevalence of private cars.

Figure 9 – The distribution of shared mobility services.



(Source: Statista- Online Mobility Services Report 2019¹⁷).

¹⁶ McKinsey Global Institute, (2016). *Independent work: Choice, necessity, and the gig economy*. <<https://www.mckinsey.com/featured-insights/employment-and-growth/independent-work-choice-necessity-and-the-gig-economy>>. [Accessed 10 January 2010]

¹⁷ *Online Mobility Services Report 2019* retrieved from Statista at <<https://www.statista.com/study/40459/etravel-report-online-mobility-services/>> [Accessed 10 December 2019]

Figure 9 shows the division of the shared mobility services in 4 main groups: ride-hailing, Shared ride hailing, car rentals and car sharing. According to the horizontal and vertical axes, ride-hailing is the most flexible since there is a professional driver who satisfies your only needs while the shared ride-hailing is less flexible since it connects the needs of more than one rider who have to agree on the terms of the rides. Car rentals have the less degree of shared usage because there is no interactions with other customers or workers.

Transportation Network Companies (TNCs), like Uber and Lyft provide a tailored, convenient solution that claims to take cars off the road. Many describe these as ride-sharing or ride-hailing services — using the two terms interchangeably. However, the two are different experiences.

Ride-hailing is when a rider “hails” or hires a personal driver to take him exactly where he needs to go. The transportation vehicle is not shared with any other riders, nor does it make several stops along a route.

Ride-sharing, by contrast, is synonymous with carpooling. It is literally the process in which a rider shares a vehicle with other riders¹⁸. It is not personal transportation like in the previous example, as the space is shared, and it will make stops to pick up other riders.

Major TNCs do offer both ride-hailing and ride-sharing services, like UberPool and Lyft Shared allowing multiple riders to share the trips if they are headed in the same direction. Despite this seems to be environmentally sustainable, in reality according to techcrunch.com only 35% of TNC trips are shared nationwide. Instead, they usually operate as glorified taxi services, hailing a ride from your phone rather than a street corner.

Booking online gives a lot of benefits for the customers: in contrast with the normal taxi service they already know the amount they are going to pay when they request a ride, they know the route the driver will take and they can follow it on their smartphones.

Some of the services facilitate real-time vehicle tracking, allow to share the payment with friends directly through the app, and has a feedback system allowing to rate and increase both drivers and riders’ reputation. A recent study by the University of Pennsylvania highlighted that the expansion of ride hailing services has reduced the instances of drunk driving, which makes these vehicles a safer choice.

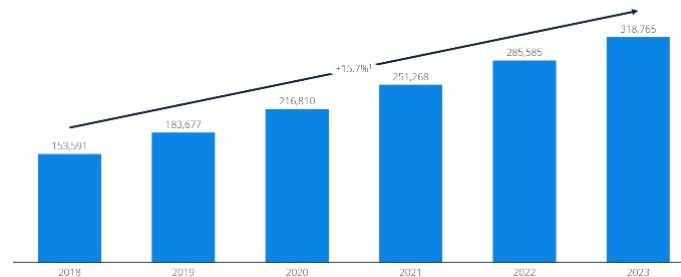
¹⁸ *Ride-hailing vs ride-sharing: The key differences and why it matters. Retrieved from <<https://www.ecolane.com/blog/ride-hailing-vs.-ride-sharing-the-key-difference-and-why-it-matters>>.* [Accessed 7 December 2019]

Figure 10 – Ride Hailing sector Revenues & Forecast.

The Ride Hailing segment shows average growth rates of around 15.7% per year

Market sizes: global

Global Ride Hailing revenue forecast in million US\$



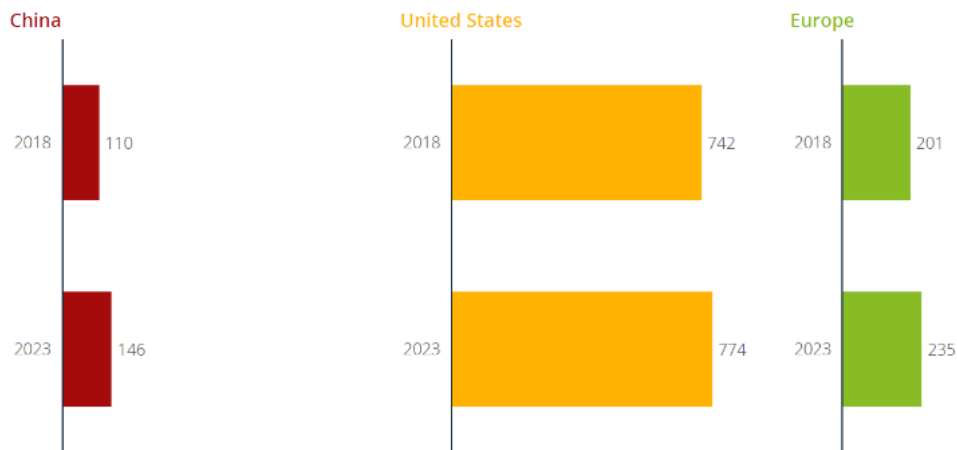
(Source: Statista- Online Mobility Services Report 2019).

From figure 10 it's possible to see how Uber, Lyft, and the countless other ride-hailing companies contributed to a reported global revenue of \$153.6 billion in 2018 which counts for 23% of the total online mobility services market. In US the revenues generated account for \$43.4 billion in 2018 while in China were \$44.5 billion. The expectations regarding the growth rates are high, two digits growth rate for Europe (13,5%) as well as for the U.S (11,7%) in the period of 2018 to 2023 but the fastest growing region is still China with a huge potential of growth of 17,5%, resulting in a market volume of 99.5 billion in 2023. The driving force behind this surge are the millions of individuals who have signed up to drive for these big players. In fact, Uber alone claims 900,000 drivers in the U.S., and 3 million worldwide¹⁹.

Figure 11 shows the average revenue per user in China, U.S. and Europe in 2018 and the expected revenue per user in 2023. U.S. users spend more than any other user in other parts of world with an average revenue pro capite of \$ 742 per year, way higher than Europe with \$201 pro capite and China with \$110, even if the last one is the market with the highest future potential.

¹⁹ How the ride-hailing industry is fuelling a new breed of start-up retrieved from Venturebeat at <<https://venturebeat.com/2019/11/08/driver-dissatisfaction-in-the-ride-hailing-industry-is-fueling-a-new-breed-of-startup/>>. [Accessed 1 December 2019]

Figure 11 – Average revenue per user forecast in US\$.



(Source: Statista- Online Mobility Services Report 2019).

E-hailing, which is the process of ordering any form of transportation pick up via virtual devices, was the largest segment, with a market share of more than 50% in 2018. The success is mainly due to the convenience of the service as well as the simple way to access and request rides.

Growth revenues of these services are expected to reach a CAGR of 13.8% of 2019 to 2025. The optimistic scenario is conducted by the increasing awareness those services are having in China and India, markets with high potential. Although the price is higher than mass transportation, they help consumers to save money required for owning a car, which is a factor considered a “driver” of the market in the future.

Given the fact that the intensity of entry barriers is very low, in making the assumptions for the future is taken into account that many traditional cab companies may develop their own applications contributing to the growth of the volume of this market segment. Negative impacts on the Ride Hailing market deriving from legal restrictions are not taken into account because these events are uncertain and unforeseeable thus not quantifiable directly.

4.2 - UBER PRE-IPO

Uber Technologies, Inc. is an American multinational ride-hailing company offering services that include peer-to-peer ridesharing, ride service hailing, food delivery, and a micro mobility system with electric bikes and scooters. The company is based in San Francisco and has operations in over 785 metropolitan areas in 63 different countries. Its platform can be accessed via its websites and mobile apps.

It was founded in 2009 by Garret Camp under the name UberCab as a way to connect people who needed rides in the city but couldn't find a taxi, with people with cars who wanted to make extra money.

According to the website and the registration statement the mission is to “ignite opportunity by setting the world in motion”, taking on big problems to help drivers, riders, delivery partners, and eaters get moving in 63 countries around the world. Always seeking the opportunity to help building a future where everyone and everything can move independently.

The company calls its users “The Monthly Active Platform Users” (MACPs) and Figure 12 taken from its statement highlights that the numbers have increased in the last two years reaching the 91 million of users. MACPs represent the number of unique consumers who completed a Ridesharing or received an Uber Eats meal on the platform at least once in a given month while the MACPs presented for an annual period are MAPCs for the fourth quarter of the year.

The number of trips increase as well by 105% in 2017 and 40% in 2018, and the Gross Bookings followed the path with a positive increase respectively of 79% and 45%.

Figure 12 – Number of users, trips and gross bookings.

	Year Ended December 31.		
	2016	2017	2018
	(in millions, except %)		
Other Financial and Operating Data:			
Monthly Active Platform Consumers (1)	45	68	91
Trips (2)	1,818	3,736	5,220
Gross Bookings (3)	\$ 19,236	\$ 34,409	\$ 49,799

Source: Uber's prospectus.

Even if it's commonly known as a “ride-sharing company”, which is understandable since it's a big portion of its business, Uber offers services in three different markets with the first two considered as the core platform²⁰:

Personal Mobility: These services include ridesharing and new mobility. Ridesharing refers to products that connect consumers with drivers who provide rides in a variety of vehicles, such as cars, motorbikes, minibuses, or taxis. New mobility refers to products that provide consumers direct access to rides through a variety of modes, including dockless e-bikes and e-scooters.

²⁰ Core platform refers to one of the two operating segments (Ridesharing and Uber Eats) who count for the majority of the business.

Revenue derived from Ridesharing products grew from \$3.5 billion in 2016 to \$9.2 billion in 2018 and Gross Bookings ²¹ derived from Ridesharing products grew from \$18.8 billion in 2016 to \$41.5 billion in 2018.

Uber Eats: it allows consumers to search for and discover local restaurants, order and have the meal delivered reliably and quickly. This service helps to increase the supply of drivers on Uber's network. For example, it enables ridesharing drivers to increase their utilization and earnings by accessing additional demand for trips during non-peak ridesharing times. Uber Eats also expands the pool of drivers by enabling people who are not ridesharing drivers or who do not have access to ridesharing-qualified vehicles to deliver meals. Over 15 million of users received a meal using Uber Eats in the quarter ended December 31, 2018 using Uber's network which includes more than 220,000 restaurants in over 500 cities globally.

Uber Freight offers logistic services and it relates to shippers ranging from small- and medium-sized businesses to global enterprises by enabling them to create and tender shipments with a few clicks, secure capacity on demand with upfront pricing, and track those shipments in real-time from pickup to delivery. Launched in the United States in May 2017, Uber contracted with over 36,000 carriers that in aggregate have more than 400,000 drivers and have served over 1,000 shippers. This business has grown to \$125 million in revenue for the quarter ended December 31, 2018 and in March 2019 Uber announce its expansion of Uber Freight offering in Europe.

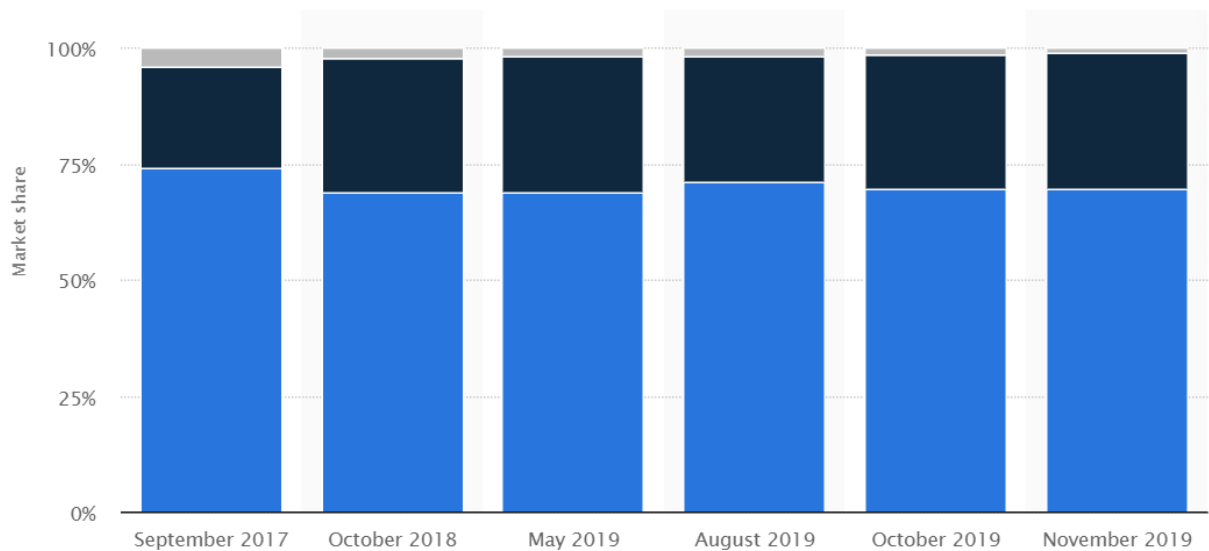
There are also other two segments who count for less than 1% of the revenues, Uber's Other Bets and Advanced Technology Programs. These segments include long Uber's early-development-stage projects and the program to develop self-driving vehicles.

Having multiple offerings is a crucial aspect to keep the platform growing and to increase the engagement with drivers, an example is during peak times when Uber Eats drivers can easily offer rides to passengers increasing their earnings.

Figure 13 highlights the leading ride-hailing companies in U.S. by market share. Uber is the leading ride-hailing company in U.S owning almost 75% of the market share in 2018, the biggest, and almost unique competitor is Lyft with a market share of 25% at the end on 2019.

²¹ Gross bookings are defined as the total dollar value, including any applicable taxes, tolls, and fees, in each case without any adjustment for consumer discounts and refunds. Gross Bookings do not include tips earned by Drivers.

Figure 13 – Leading ride-hailing companies in U.S. by market share.



(Source: Ride-sharing service in the U.S. Statista²²)

Uber financial results

Figure 14 from the prospectus publishes a breakdown between the revenues made by the core platforms and the other activities as well as in which area core platforms' revenues are generated. Uber reported revenues of \$9,182 million in 2018, with an increase of 33% over 2017 revenues of \$6,888 million.

Figure 14- Uber's revenue breakdown.

	Year Ended December 31,		
	2016	2017	2018
Ridesharing revenue	\$ 3,535	\$ 6,888	\$ 9,182
Uber Eats revenue	103	587	1,460
Vehicle Solutions revenue (1)	188	345	143
Other revenue	18	45	112
Total Core Platform revenue	\$ 3,844	\$ 7,865	\$ 10,897
Total Other Bets revenue	\$ 1	\$ 67	\$ 373
Total revenue	\$ 3,845	\$ 7,932	\$ 11,270

	Year Ended December 31,		
	2016	2017	2018
United States and Canada	\$ 2,373	\$ 4,300	\$ 6,148
Latin America ("LATAM")	523	1,645	2,002
Europe, Middle East and Africa ("EMEA")	659	1,157	1,721
Asia Pacific ("APAC")	289	763	1,026
Total Core Platform revenue	\$ 3,844	\$ 7,865	\$ 10,897

(Source: Uber prospectus.)

²² Market share of the leading ride-hailing companies in the United States from September 2017 to November 2019 retrieved from Statista at <<https://www.statista.com/statistics/910704/market-share-of-rideshare-companies-united-states/>> [Accessed 10 January 2020]

Uber revenue almost doubled in 2017 (95%) with respect to the performance of the previous year of \$3,535 million.

The biggest growth was shown by the Uber Eats segment with an increase in 2 year by more than 12 times the revenue reported in 2016, highlighting the strong potential the segment has in relation with the other services offered by the platform. U.S market and Canada are still the biggest source of revenue who counted 56% of the total revenue generated in 2018, with an increase of 43% in the same year compared to 2017. They managed to increase the revenues in every area of the world, with Latin America being the second biggest source of revenue.

Despite the growth, Uber has consistently struggled to be profitable, losing money in 2016 (\$3.2 billion) and in 2017 (\$4billion) while 2018 the company has been able to turn into a positive operating income of almost \$1 billion on \$11.3 billion revenue. This was mainly due to the 4.993 million of other income which includes almost \$1,993 million of a gain from a fair value adjustment the investment in Didi and \$3,214 of gain on two divestitures: the disposition with a retained interest in the Uber Russia/CIS operation and the sale of the Company' Southeast Asia operations.

Figure 15 – Uber's part of the income statement.

Loss from operations	(3,023)	(4,080)	(3,033)
Interest expense	(334)	(479)	(648)
Other income (expense), net	139	(16)	4,993
Income (loss) from continuing operations before income taxes and loss from equity method investment	(3,218)	(4,575)	1,312
Provision for (benefit from) income taxes	28	(542)	283
Loss from equity method investment, net of tax	—	—	(42)
Net income (loss) from continuing operations	(3,246)	(4,033)	987

(Source: Uber prospectus.)

Balance sheet

As reported in the consolidated balance sheet at 31 December 2018, company's total assets increased from \$15,426 million in 2017 to \$23,988 million in 2018. The biggest portion of this increment was due to the investments made during 2018 and the increase in cash and cash equivalent (mainly due to the issuance of a loan of \$3,446 million). Cash from investing activities was primarily used to buy property plant and equipment and to invest in acquisitions as reflected by the line "equity method investments".

Figure 16 - Assets side of Uber's consolidated balance sheet.

	As of December 31, 2017	As of December 31, 2018
Assets		
Cash and cash equivalents	\$ 4,393	\$ 6,406
Restricted cash and cash equivalents	142	67
Accounts receivable, net of allowance of \$28 and \$34, respectively	739	919
Prepaid expenses and other current assets	425	860
Assets held for sale	1,138	406
Total current assets	6,837	8,658
Restricted cash and cash equivalents	1,293	1,736
Investments	5,969	10,355
Equity method investments	—	1,312
Property and equipment, net	1,192	1,641
Intangible assets, net	54	82
Goodwill	39	153
Other assets	42	51
Total assets	\$ 15,426	\$ 23,988

Source: Uber prospectus

Before the IPO, the company in order to fulfil its needs of growth, financed its activity mainly with debt as it can be noted by the balance sheet presented long term debt more than doubled from \$3,048 million to \$6,869.

Recent acquisitions

Ever since its inception, Uber has actively followed a policy of buying other businesses and start-ups. Uber's acquisitions include both competitors as well as business engaged in separate domains.

The first public acquisition was in 2015 when Uber bought DeCarta, a mapping technology start up for an undisclosed amount. In 2016, Uber bought Otto for \$680 million, an American technology company specialized in the development of driver-less trucks. In late 2016, Uber sold its operations in Southeast Asia to Grab, a Singapore based company gaining in return a 27.5% stake in Grab.

In December 2017, Uber and its Russian competitor Yandex agreed to a joint venture, operating car hailing services in 127 cities across Russia, Armenia, Azerbaijan, Belarus, Georgia and Kazakhstan spending \$225 million for 36.6% of the stake.

In order to expand into areas of transportation beyond cars, Uber acquired JUMP for \$139 million in April 2018. JUMP is a scooter and electric bicycle sharing which operates mainly in the United States.

On March 2019, Uber completed the biggest acquisition of its history acquiring Careem for a \$3.1 billion deal. Careem is a Dubai based company and was the Middle Eastern ride sharing

rival. Thanks to the deal, Uber is able to control Careem's operations in 15 countries and the acquisition ended the costly price war between the two companies.

Opportunities and challenges

Uber it's not just a taxi/limo service, it's a transportation business. For this reason, Uber estimates its personal mobility TAM²³ to be 11.9 trillion of miles per year, which they believe to cover in the long term, including both miles travelled in vehicles and with public transport. TAM represent the theoretical total market that could exist for a product assuming no competition and unlimited resources to the provider. TAM puts out large numbers and give the potential, even if almost impossible, market for a company.

In Uber Technologies' initial public offering filing, it cited a TAM so large it fogged investment bankers' glasses: \$5.7 trillion for rides, plus \$2.8 trillion for meal delivery, plus \$3.8 trillion for freight. That's \$1,600 for each person on Earth. There are two ways to see Uber: as a company valued at \$81 billion that is expected to burn through \$9 billion over three years or think of it as a company that so far has reached only 0.1% of its TAM. Truth is always in the middle. More attention is paid into SAM (service addressable market), which is nothing more than the portion of the market that the company is looking to target with its products or services. As stated by the prospectus, Uber's personal mobility SAM is estimated to be 3.8 trillion miles, one third of the TAM stated above, representing \$2.5 trillion market opportunity in the 57 countries where they have operational control. Their ambitious near-term SAM consist of 4.7 trillion miles per year with a \$3 trillion market opportunity. In 2018 they've been able to serve 26 billion miles on its platform implying less than 1% penetration rate of their near-term SAM.

One of the first objectives then seems to increase the penetration in existing markets as well as in new markets where, due to current regulations, Uber is not heavily present like Argentina, Germany, Italy, Japan, South Korea and Spain with a \$0.5 trillion of potential addressable market opportunity.

Uber Eats segment, which showed the highest growth in 2018 is estimated to expand its presence from 500 to more than 700 cities where Uber already operates the Personal Mobility Services.

²³ The Total Addressable Market (TAM), also referred to as total available market, is the overall revenue opportunity that is available to a product or service if 100% market share was achieved. (source: Corporate Finance Institute)

Uber ambitious plan to increase its presence in the world needs to pursue targeted investments and acquisitions as they did in the past. The biggest acquisition of its history (and the last one) was valued \$3.1 billion for the acquisition of Careem, increasing its presence in Middle East, North Africa, and Pakistan. Those are attractive markets due to their size and growth potential, driven by tech-savvy populations, high smartphone penetration and low rates of car ownership.

Finally, investing in Advanced Technologies is the biggest challenge, including autonomous vehicle technologies. According to MarketWatch the global self-driving car market is expected to expand at a CAGR of 36.2%, leading to global revenue of \$173.15 billion by 2023. Autonomous vehicles also well-known as “robot cars” are driverless vehicles, controlled by the computer. Many autonomous vehicles in development use a combination of cameras, sensors, GPS, RADAR, LIDAR, and an on-board computer. These technologies work together to map the vehicle’s position and its proximity to everything around it. Robo-taxis may transform the industry because operating costs could be half that of cars with drivers since for ride-sharing companies, the biggest portion of its cost are the drivers. A widespread rollout of robo-taxis could exclude company like Uber from ever reaching profitability if they’re not investing on it. For these reasons, Uber entered into partnership agreements with OEMs²⁴ such as Toyota, Volvo, and Daimler, which will enable to introduce vehicles with Uber’s autonomous vehicle technologies onto its network.

Risk factors

Uber’s risk factors section in the prospectus is particularly comprehensive with 35,000 words serving as a warning to investors (Microsoft’s prospectus contained 1,100 words in the risk factors section when it went public in 1986).

Uber competes on a global basis in each of the industries it operates against well established and low-cost alternatives. The expectation for the future is even more competition from new market entrants due to low barriers to entry. Each market has low switching costs and costumers are prone to switch to the lower cost or highest quality provider. Threat doesn’t come only from the customer side: drivers can switch to the platform which offers the highest earning potential and restaurants have a tendency to shift to the platform which provides the highest volume of orders or charges the lowest fee for the service.

²⁴ OEM means Original Equipment Manufacturer, in the automotive industry this term generally refers to automotive manufacturers.

Another consideration has to be done about the strategy: while Uber is working to expand its business globally and introducing new products across a range of products, the competitors remain focused in a smaller geographic area or on a limited number of products or target customers allowing them to develop expertise and concentrate the resources in a more dedicated and specified way resulting in a better service.

Increased competition triggers the reduction in the utilization rate of the platform, which would harm the revenues and the margins.

Competition in personal mobility services derives from personal vehicle ownership and usage (which accounts for the majority number of miles in the markets that Uber is serving), taxi and public transportation, which is also the lowest- cost transportation option in many cities. In ride-sharing there are plenty companies providing the same service both with cars and with bikes. Uber faces competition also in the development of autonomous vehicles, including Waymo, Tesla, Apple and in the prospectus is explicitly cited that other companies have already introduced, or might introduce earlier than Uber, autonomous vehicle offerings which is estimated to takeover the future of transportation.

Competition also relates to the access to drivers and customers, to have the most efficient pricing model and to have greater access to resources. In certain geographic markets Uber struggles against companies who have a better brand recognition or longer operating histories. To remain competitive in certain markets and generate network and scale liquidity, they have in the past lowered fares or service fees, offering significant driver incentives and consumer discounts and promotions which clearly impact the financial performance of the company.

Losses incurred in the past are not negligible, respectively \$4 billion and \$3 billion in 2017 and 2018. Increasing revenues and cut the operating costs seem to be the priority for next years, and even if they do, it's not sure the it results in the maintenance or increase in profitability. Effort and strategies made up are new and unproven, any failure could prevent the company to reach profitability.

Currently, the driver is the most expensive costs and one of the biggest risks related to them is the classification. Up to now, they are classified as independent contractors but if judicial decisions or legislation will require Uber to classify them as employees the company will incur in numerous expenses like minimum wage, overtime, meal, rest periods requirement, employee benefits and social security contributions. The biggest threat will be then that such reclassification will require Uber to basically change its business model having an adverse impact the business and the financial condition.

It's also important to keep the drivers, restaurants, shippers and carriers into its platform and attract new ones otherwise financial results would be adversely impacted.

Maintaining and enhancing the brand and reputation is critical to attract new employees and platform users. Recently, Uber has received negative media coverage around the world: #DeleteUber campaign, a post published by an employee on Uber's toxic culture and other events influenced negatively the brand reputation of the company. There is also a website (<https://www.whosdrivingyou.org/rideshare-incidents>) containing a list of incidents and deaths attributed to Uber and Lyft Drivers.

One of the challenges is the expansion outside the US market, including in those market where Uber has a low expertise. Manage the business internationally entails more risks and not being able so successfully deal with them will harm the financial result and the future of the company

Uber is subjected to different laws and regulations in different jurisdictions where they operate. Since they might change unexpectedly, they might incur in liabilities as soon as new laws and regulation will be introduced. For instance, Uber is facing litigation in few jurisdictions they operate which have been brought by taxicab owners, local regulator and law enforcement as well as platform users such as drivers and consumers.

4.3 - THE IPO OF UBER

Uber went public the 10th May 2019 with a share price of \$45 giving the company a value of around \$81 billion dollar. The shares started being traded on the New York Stock Exchange on May 10, 2019, under the symbol "UBER".

Drafting the prospectus, the range of the share price was \$44-\$50 and the company in the end decided to settle the price toward the low end of the range to be more cautious and to avoid or at least limit high fluctuations. Few months before the IPO there were rumours saying Uber was seeking a valuation around \$120 billion which is way higher than the actual valuation, and in part was conditioned by how Lyft's stock behaved in the first month of trading.

Lyft started its own IPO process in December and listed its shares on March 29, 2019. Uber had to accelerate the process when Lyft went public although its modest valuation of \$20 billion.

Huber Horan, an analyst with 40 years of experience, to explain the hurry of the ride-hailing companies to become public said “Uber and Lyft both recognized that the overall tech equity bubble might be bursting in light of growing awareness that long-term growth and profit expectations at companies like Facebook, Twitter and Amazon may not have been firmly grounded in reality”. This is coherent with what Teoh, Welch and Wong (1998) found in their study, highlighting the importance of the timing of an IPO. Companies before the IPO analyse the market and they decide to face it when it’s best for them, when they gained confidence by investors, their business cycle is in expansion, they have a good management and when they have conquered a significant market share.

Regarding the timing, Chemmanur, Fulghieri (1999) argued that the best timing to go public is determined by the firm’s trade-off between minimizing the duplication in information produced by the outsider and the avoiding the risk premium demanded by venture capitalists. Uber’s shares effectively started to trade at \$42 after the IPO, even below the range predicted in the prospectus of \$44-\$50.

Uber CEO Dara Khosrowshahi said during an interview that Lyft’s stock bad performance led them to be more conservative given the fact that the day Uber went public Lyft’s shares were already down 20% since its IPO price. The day Uber went public the shares dropped by 7,6% (Lyft’s shares dropped 7,4%) and, according to the Uber CFO Nelson Chai, the company went public in a “tough week” full of tension between China and U.S. Nevertheless, they didn’t want to delay the IPO because they weren’t focused on the opening price optimization but on how the stock could trade over time.

The underwriters have been granted a 30-day option to purchase up to an additional 27 million shares from certain selling stockholders at the initial public offering price minus underwriting discounts and commissions.

A small part of these shares, exactly 3% of the total, was allowed to be purchased by Uber’s drivers at the IPO price, while PayPal made an agreement to buy \$500 million worth in a private placement at the IPO price. Uber hired Morgan Stanley and Goldman Sachs to lead the offering, but Uber hired other 27 investment banks to support the IPO, of which 11 of them have been included also in Lyft’s IPO.

Figure 17 – List of investment banks hired for the IPO.

Morgan Stanley			Goldman Sachs & Co. LLC					BofA Merrill Lynch
Barclays			Citigroup					Allen & Company LLC
RBC Capital Markets			SunTrust Robinson Humphrey					Deutsche Bank Securities
HSBC			SMBC					Mizuho Securities
Needham & Company			Loop Capital Markets					Siebert Cisneros Shank & Co., L.L.C.
Academy Securities	BTIG	Canaccord Genuity	CastleOak Securities, L.P.	Cowen	Evercore ISI	JMP Securities	Macquarie Capital	
Mischler Financial Group, Inc.		Oppenheimer & Co.	Raymond James	William Blair	The Williams Capital Group, L.P.		TPG Capital BD	

(Source: Uber prospectus)

Uber IPOs was one of the biggest in the U.S. stock markets since Alibaba who raised \$25 billion in 2014 under a valuation of \$167 billion and Facebook in 2012 who raised \$16 billion under a valuation of \$104 billion.

In 2017 Uber’s board forced Travis Kalanick to abandon his position of CEO after a scandal and bad PR publicity that followed the events. The main argument regarded the sexual harassment but beyond this theory experts think it was because Kalanick didn’t want Uber to become public in the foreseeable future. He was famous for his statement saying he would take Uber public “as late as humanly possible” because he knew that Uber wasn’t ready to bear the inspection of capital market. Kalanick resigned with effect from the 1st January 2020 after selling \$2,5 billion worth of stocks. Khosrowshahi then, former CEO of Expedia took the leadership after promising to take the company public before the end of 2019 seeking a valuation on up to \$120 billion. Most of the decision he took in his nearly 2 years as a CEO appeared to have the intention to get Uber in shape for its IPO. Uber’s IPO biggest winners were, first of all, the two founders Kalanick and Camp. Kalanick at the end of the IPO owned roughly \$6 billion of value into the company, Mr. Camp reached \$4,1 billion of ownership. Softbank, which is the biggest shareholder owned 16,3% of the stake at the time of the IPO resulting in approximately \$13 billion. Then Saudi Arabia’s Public Investment fund and Alphabet ended up having roughly the same stake in the company of nearly \$3,6 billion.

During the road-show Uber’s intention was to accurately select the shareholders to safeguard the share price. Indeed, institutional shareholder are more willing to keep the stock for a long time allowing the company to mitigate the turbulent first weeks of trading also after what happened to Lyft.

Uber went public with a one-vote one-share policy which goes in contrast with what tech companies have done during the last few years. Dual class share structures have the aim to keep concentrated the control among founder and pre-IPO shareholders once the company goes public. Companies achieve this by creating a class of stock with many votes per share and a second class of shares for the public with one or even zero vote (like Snapchat in 2017).

Dropbox, Eventbrite, Blue Apron, went public with two different classes of shares: class A gave 10 votes and class B only 1. Uber competitor Lyft took the same path, selling class A stock with one vote per share and keeping class B shares with 20 votes per share.

4.4 - THE VALUATION OF UBER

Uber is a unique company, it has different business lines, operates in different countries and owns significant stakes in many other companies. The most similar firms present in the stock market are Lyft, which is in competition only for the ride-hailing sector and GrubHub which competes only for the meal-delivery segment. The value of the company was not easy to determine at the time of the IPO: as stated in the previous paragraph, the company went public with \$45 dollars leading to a valuation of around \$81 billion: a considerably high value since it's one of the biggest IPOs in 10 years.

Figure 18 – Uber's stock price chart from IPO date to the end of 2019



(Source: Yahoo Finance Charts)

Figure 18 shows the stock price trend of Uber which performed badly since its debut and the price dropped by almost 34% from the IPO date to the end of 2019 losing \$27 billion of market capitalisation. The 8th August 2019 Uber released the financial results for the second quarter, and they turned out to be surprisingly negative. As you can see from the Figure 19, trips, gross bookings and users grew more than 30% respect the second quarter the year before. Revenues grew by 14% but loss attributable to Uber increased from \$739 million to \$5.2 billion. From the chart is possible to see the reaction of the market after the results, the

stock price headed downwards. However, what alarmed investors were not the whole amount, in fact \$3.9 billion from those \$5.2 billion were stock-based compensation losses related to its IPO hence the “adjusted” loss was only \$1.3 billion. Despite the good promises, Uber kept losing money and the losses almost doubled respect the same quarter the year before.

Figure 19- Uber financial results Q2 2019

<i>(in millions, except per share amounts, and percentages)</i>	Three Months Ended June 30,		
	2018	2019	% Change
Gross Bookings	\$12,012	\$15,756	31%
Monthly Active Platform Consumers (“MAPCs”)	76	99	30%
Trips	1,242	1,677	35%
Revenue	\$ 2,768	\$ 3,166	14%
Loss from operations (1), (2)	\$ (739)	\$ (5,485)	**
Net loss attributable to Uber Technologies, Inc. (1), (2)	\$ (878)	\$ (5,236)	**
Diluted net loss per common share	\$ (2.01)	\$ (4.72)	(135)%
Adjusted Net Revenue (“ANR”) (1), (3)	\$ 2,574	\$ 2,873	12%
YoY % Growth at constant currency & ex-Driver appreciation award (3)			26%
Core Platform Contribution Margin (as a % of ANR)	14.7%	8.2%	**
Adjusted EBITDA (3)	\$ (292)	\$ (656)	(125)%

(Source: Uber website, investors section.)

The second significant drop in the stock price happened the 6th of November when the lockup period ²⁵of 180 days ended. Of the roughly 1.7 billion Uber shares outstanding, about 1 billion have been locked up since the IPO in May and as you can see from the chart, insiders didn’t lose the opportunity to sell the shares reflecting the period with the highest volume of trading.

According to the chart, the price of Uber seemed to be higher respect the real value of the company. I wanted to investigate if the company at the time of the IPO was overvalued and what could be the main causes. According to the literature, Lowry and Schewert (2002), Loughran and Ritter (2004) found that generally technology firms are subject to underpricing and high first day returns and this did not happen for Uber. Doing so, I provide a company valuation with Discounted Cash Flow (DCF) methodology and a “Rider-based” valuation. I based my decision to anchor the valuation on the DCF mainly for 3 reasons:

²⁵ The lockup period is the period after the IPO where insiders, including early investors and employees, are “locked-up” and cannot sell the shares.

-DCF is one the most common valuation method and it allowed me to compare my valuation with other analysts' valuations;

-Given the disrupting and diversified business in which the company operates, it's hard or nearly impossible to find appropriate comparable companies and the DCF model allows me to come up with a value without comparing the company to other firms;

-As TV Mohandas Pai, currently chairman at Manipal Global Education said: "Valuation is an art, not a science", and the DCF model grants me the possibility to "play" with the numbers and with sensitivity analysis have a better understanding on what drives value the most.

The Rider-based valuation is proposed by Damodaran for companies who derive the value from users or subscribers. It's different from the Discounted Cash Flow because its focus is on the cash flow generated by the users of the platform and the ability of the company to increase the user base, and more specific assumptions such as renewal rate, lifetime of the customers and ability to increase the revenues per user.

This model it is divided in three blocks:

-Value of the existing users calculated with the profit per users derived from the diverse between the revenues per users minus the cost per users, taking into account the lifetime, the stickiness and the renewal (the extent that users will drop out) rate of users;

-Value added from the new users calculated in the same way as the existing users but netted from the acquisition cost sustained to attract new customers;

-Value drag from corporate expenses that are not directly attributable to the users.

I'll go more into detail presenting the model in the next paragraphs.

DISCOUNTED CASH FLOW MODEL

Triton's founder Rett Wallace writing an article in The Financial Times ²⁶claimed that Uber's S-1 filing was almost useless, with 396 pages of confusing data it fogged the investors and the public as if they had to hide something. Nevertheless, the starting point of my valuation is Uber's registration statement which is still the most reliable and last updated source for company's data.

²⁶*Uber's enormous, vague IPO prospectus is an outrage* retrieved from *The Financial Times* at <https://www.ft.com/content/60ab80e2-6a8b-11e9-9ff9-8c855179f1c4> [Accessed 19 December 2019]

Table 13 presents my DCF valuation. I've used 10 years for the explicit forecast period and from there I've calculated the terminal value based on an assumed constant growth rate of 2%. The first projected year is 2019 albeit official data released by the company in its website in the section for investors are available until Q3, therefore I've adjusted the first-year projections in order to be as much as possible in line with the data communicated by the company.

According to how Uber presents its data, in making the projection I divided the business between Core platform, which included the Ride-Hailing and Uber Eats, and Other Bets which are primarily made by Uber Freight.

The most important assumptions are explained below:

- Revenue growth: As written in the prospectus, revenues are extremely driven by the ability to maintain and attract new customers. The starting point of my valuation is the Gross Bookings who in the past increased by more than 40%. In my opinion, the company will be able to increase the number of users, the annual trips and the average bookings per trip but the growth rate decelerates during the years and for that reason I've assumed a constant Gross Bookings growth rate of 25%. The adjusted net revenues historically in the last three years were around 20% of the gross bookings hence, Given the complexity of the business, the difficulty in reducing the costs and the high degree of competition, I've assumed 19% of the gross booking to calculate the net revenues during the forecasted period;
- Core platform contribution margin: It is the margin generated after direct expenses, and in the last three years it went from -23,8% in 2016 to 9,5% in 2018. Nevertheless, it's also explicitly written that in the next few years the company expects a negative contribution margin due to the investment and according to data released by the company on 2019, the margin will be negative in the forecasts until 2020, after that it will turn positive from 2% to 13% in 2029;
- Sales to Capital Ratio: to calculate the amount of expenses the company has to sustain to keep the revenue growing, I've used the Sales to Capital Ratio of 4 (as used by Damodaran in his valuation of Uber).²⁷
- I took the 75 percentile of U.S. companies of 9,97%. From the sixth to the tenth year of forecast I decreased the Cost of capital to 9% and for the terminal growth I've used 8,24% which is the median of U.S companies once they become mature. Despite this number might seem low, and even if the company is losing money, Uber has 10

²⁷ Sales to capital ratio taken from Damodaran's blog. *Uber's Coming out Party: Personal Mobility Pioneer or Car Service on Steroids?* Available at <http://aswathdamodaran.blogspot.com/> [Accessed 10 December 2019]

billion in revenue and I don't consider the company as a start-up anymore, which led me to use a cost of capital fairly in line with the one of mature companies;

- Final growth rate: I've computed 2% as the terminal growth rate which is the most common final growth rate in DCF model and it's also the historical U.S. inflation rate²⁸;
- Tax rate: for what concern the tax rate I've used 25% which includes the federal tax rate plus local and foreign taxes;
- Depreciation rate: Uber's business model doesn't require the company to own a big amount of assets. In 2018, the amount of depreciation and amortization was roughly 4% of the adjusted net revenue. In the period forecasted I kept 4% as the amount of D&A because I don't expect the company to increase the value of assets with big investments or to change the business model.

I've made some assumption for the other segment presented by Uber which is called "Other Bets" including mainly Uber Freight and some small other businesses. The S-1 filing gave little insight into this segment and so these numbers might be more speculative respect to the core platform segment.

According to the prospectus, the Serviceable Addressable Market (SAM) is \$700 billion, which is the U.S. freight truck market since they currently operate only in U.S. One of the goals of the company is to expand this business into Europe and for this reason I've assumed the SAM to increase for the first 4 years at 8%, then 7% until the last years with 6,5% In the end, the SAM will more than double in 10 years.

Given the young age of the business (It was launched in May 2017), the market penetration is low (0,05%) respect the total market calculated as total revenue for the Uber freight segment of \$373 million respect the total SAM of \$700 billion. I think the company will be able to increase the total market penetration as well as expand the service in the future, for this reason I've assumed an increasing market penetration until 0,5% the last year forecasted.

According to this assumption, contribution to profit and loss will turn positive in 2022 reaching \$1 billion in 2029, at the end of the period forecasted.

²⁸Source: historical Inflation Rate taken from inflationdata.com

Table 11 – Uber’s data 10 years comparison.

	Current (FY 18)	Year 10
Serviceable Addressable Market (SAM)	700 billion	1,42 trillion
Market Penetration	0,05%	0,5%
Other Bets Revenue	\$373 million	\$ 7,1 billion
Other Bets Contribution Profit / (Loss):	\$ (152 million)	\$1 billion

(Source: my valuation of Uber.)

Figure 20 resumes the final calculation to define the estimated value per share obtained with the Discounted Cash Flow method which is \$30,53. Using the 2% terminal growth rate and the discount rate of 8,24% the present value of the company’s terminal value is approximately \$38 billion, 87% of the implied enterprise value. The implied value per share of \$30,53 is enough lower than the IPO price of \$45. The implied equity value resulted is around \$51 billion respect the value given from the IPO of roughly \$80 billion. There are a lot of question marks regarding the future of the company and there is even more uncertainty regarding the timing and the impact of the autonomous vehicles. This valuation doesn’t take into account the competition deriving from self-driving autonomous vehicle because if and when they will take place the business model and the cost structure will have to change completely.

Figure 20 – Enterprise value calculation and implied share price.

Terminal Value - Perpetuity Growth Method:	
Baseline Terminal FCF Growth Rate:	2,0%
Terminal discount rate	8,24%
Baseline Terminal Value:	89.834
(+) PV of Terminal Value:	37.947
(+) PV of Year 20 NOL Balance:	-
(+) Sum of PV of Free Cash Flows:	5.886
Implied Enterprise Value:	\$ 43.833
(+) Cash & Cash-Equivalents:	\$ 6.406
Cross holding	\$ 8.000
(-) Total Debt & Capital Leases:	\$ (6.869)
Implied Equity Value (Market Cap)	\$ 51.370
Basic Shares Outstanding:	1.682,500
Implied Share Price from DCF:	\$ 30,53

(Source: my valuation of Uber.)

The sensitivity analysis in the Table 12 shows that Uber’s market capitalisation is highly sensitive to changes in “Take rate” and “Growth in Gross Bookings”. The more the company is able to work on the cost structure and reduce the bargain power of the drivers and customers, the more the take rate increases leading to a higher profit margin and company’s value. From the other side of the table, maintaining all other assumptions unchanged, it’s possible to note that if the company is able to grow in terms of Gross Bookings the value of the company increases. Reasonably, since the cost structure of the business model is hard to change, the company is pursuing a strategy of growth but keeping high growth rates in the long term would increase the related costs and Uber has sooner or later have to deal with it, developing a platform which led them to lock drivers or to get a subscription fee from the customers.

Table 12 - Sensitivity analysis between take rate and gross bookings of Uber’s market cap

		Take rate				
		3%	11%	19%	27%	35%
Growth in Gross bookings	5,00%	\$ 15.368	\$ 20.078	\$ 24.787	\$ 29.496	\$ 34.206
	15,00%	\$ 17.017	\$ 26.124	\$ 35.231	\$ 44.338	\$ 53.445
	25,00%	\$ 19.566	\$ 35.468	\$ 51.370	\$ 67.273	\$ 83.219
	35,00%	\$ 23.000	\$ 48.059	\$ 73.204	\$ 98.564	\$ 123.924
	45,00%	\$ 26.732	\$ 61.842	\$ 97.382	\$ 132.922	\$ 168.462

(Source: my valuation of Uber)

Table 13 – Discounted Cash Flow model, Ubers’ projections.

Uber key drivers	Units:	HISTORICAL	PROJECTED									
		FY 2018	FY 19	FY20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28
Revenue and Contribution Margin for Ridesharing and Uber Eats:												
Gross Bookings:	\$ M	49.799	62.249	77.811	97.264	121.580	151.974	189.968	237.460	296.825	371.031	463.789
Growth Rate:	%	44,7%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%	25,0%
Adjusted Net Revenue % Gross Bookings:	%	19,9%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%	19,0%
Core Platform Adjusted Net Revenue:	\$ M	9.924	11.827	14.784	18.480	23.100	28.875	36.094	45.117	56.397	70.496	88.120
Core Platform Contribution Profit / (Loss):	\$ M	\$ 940	\$ (237)	\$ (148)	\$ 370	\$ 924	\$ 1.733	\$ 2.888	\$ 4.512	\$ 6.768	\$ 8.812	\$ 11.456
Core Platform Contribution Margin:	%	9,5%	(2,0%)	(1,0%)	2,0%	4,0%	6,0%	8,0%	10,0%	12,0%	12,5%	13,0%
"Other Bets" (Primarily Uber Freight):												
Uber Freight Revenue:	\$ M	\$ 373	\$ 756	\$ 1.225	\$ 1.323	\$ 1.905	\$ 2.548	\$ 2.726	\$ 3.500	\$ 3.745	\$ 5.343	\$ 7.113
Market Penetration:	%	0,05%	0,10%	0,15%	0,15%	0,20%	0,25%	0,25%	0,30%	0,30%	0,40%	0,50%
Total Serviceable Addressable Market (SAM):	\$ M	700.000	756.000	816.480	881.798	952.342	1.019.006	1.090.337	1.166.660	1.248.326	1.335.709	1.422.530
Market Growth Rate:	%		8,0%	8,0%	8,0%	8,0%	7,0%	7,0%	7,0%	7,0%	7,0%	6,5%
Uber Freight Contribution Profit / (Loss):	\$ M	\$ (152)	\$ (151)	\$ (122)	\$ (66)	\$ 95	\$ 204	\$ 273	\$ 420	\$ 506	\$ 748	\$ 1.067
Contribution Margin:	%	(40,8%)	(20,0%)	(10,0%)	(5,0%)	5,0%	8,0%	10,0%	12,0%	13,5%	14,0%	15,0%
Company-Wide Free Cash Flow Projections:												
Total Adjusted Net Revenue:	\$ M	\$ 10.297	\$ 12.583	\$ 16.009	\$ 19.803	\$ 25.005	\$ 31.423	\$ 38.820	\$ 48.617	\$ 60.142	\$ 75.839	\$ 95.233
Total Contribution Profit / (Loss):	\$ M	788	(388)	(270)	303	1.019	1.936	3.160	4.932	7.273	9.560	12.522
(-) Depreciation & Amortization:	\$ M	(426)	(503)	(640)	(792)	(1.000)	(1.257)	(1.553)	(1.945)	(2.406)	(3.034)	(3.809)
% Adjusted Net Revenue:	%	4,14%	4,00%	4,00%	4,00%	4,00%	4,00%	4,00%	4,00%	4,00%	4,00%	4,00%
Operating income (EBIT)	\$ M	362	(891)	(911)	(489)	19	679	1.607	2.987	4.868	6.526	8.713
Operating margin %	%	3,5%	(7,1%)	(5,7%)	(2,5%)	0,1%	2,2%	4,1%	6,1%	8,1%	8,6%	9,1%
Beginning NOL Balance:	\$ M		5.100	5.991	6.902	7.390	7.371	6.692	5.085	2.098	-	-
(+) NOLs Created:	\$ M		891	911	489	-	-	-	-	-	-	-
(-) NOLs Used:	\$ M					(19)	(679)	(1.607)	(2.987)	(2.098)	-	-
Ending NOL Balance:	\$ M		5.991	6.902	7.390	7.371	6.692	5.085	2.098	-	-	-
			-	-	-	-	-	-	(524)	692	1.632	2.178
Net Operating Profit After Tax (NOPAT):	\$ M		(891)	(911)	(489)	19	679	1.607	2.987	4.175	4.895	6.535
(+) Depreciation & Amortization:	\$ M		503	640	792	1.000	1.257	1.553	1.945	2.406	3.034	3.809
(-) CAPEX	\$ M		572	856	948	1.301	1.604	1.849	2.449	2.881	3.924	4.848
Sales to capital ratio			4	4	4	4	4	4	4	4	4	4
Unlevered Free Cash Flow:	\$ M		(959)	(1.127)	(645)	(281)	332	1.311	2.482	3.700	4.004	5.496
Discount Rate (WACC):	%		9,97%	9,97%	9,97%	9,97%	9,97%	9,00%	9,00%	9,00%	9,00%	9,00%
PV of Unlevered FCF:	\$ M		(872)	(932)	(485)	(192)	206	782	1.358	1.857	1.844	2.321

(Source: my valuation.)

RIDER BASED VALUATION MODEL

Uber in its prospectus emphasises the big potential of its “personal mobility” business using terminologies like TAM and SAM and the respective earnings potentials. To avoid the uncertainty regarding those numbers presented in the prospectus I’ve decided to take another approach to value the company and to focus my attention on the users of the platform and the value generated anchoring my calculations on Uber’s financial data like revenues and costs per user.

This approach was firstly introduced by Damodaran in 2017 ²⁹who tried to give a value of Uber despite the lack of information. Since the company is now public more data are available and is possible to make more reliable assumptions, I’ve used the same framework but with my own assumptions.

The Rider-based valuation is a valuation divided in three blocks: value of existing users, value added by new users and corporate expenses.

The value of the existing users is no more than the cash flow they generate to the company and is calculated taking into account the revenue and cost per user, leading to an operating income per user. Dividing the total Gross Bookings of \$49.799 with the 91 million users defines the Gross Bookings per user of \$546 meaning that each user of the platform contributes to generates \$546 in rides. Given the difficulty for Uber to manage the cost structure, I’ve assumed the same Take Rate over the years of 20,68%, meaning that what’s left for Uber from the total Gross Bookings is only 20,68%. Indeed, if a ride costs 10\$ to the customer, approximately \$8 goes to the driver and Uber takes only 2\$. Therefore the Net revenue per user is \$113,15.

After that, it’s necessary to define stickiness of the users to understand for how much time the customer will stay with the firm and what’s the probability to lose him along the way. Then is has to be included the possibility the company will sell more services or increase the consume per user of the same service increasing the profitability over time, which is translated in growth potential. Hence, I start with the profit per user, let it grow over the user’s lifetime and adjusted from the fact that some users might drop out and then calculate the present value, coming up with the value per existing user. After that, I multiply this value for the total number of users arriving to the first building block of the model: the total value of the existing users.

²⁹ Uber rider-based valuation is available on Damodaran’s website. See <<http://aswathdamodaran.blogspot.com/2017/06/usersubscriber-economics-alternative.html>> [Accesses 10 December 2019]

Some important insight from this model:

- User's value increase with loyalty: less users the company loses on the way more valuable will be in the long term.
- User's value is directly proportional to the profitability and then to then company's ability to sell additional/different services or to incentivize the user to use more times the service;

Table 14 – Main assumptions and calculation for the valuation.

	2018	2017
Number of existing users/subscribers	91	68
Gross Billings	\$ 49.799	\$ 34.409
Net Revenue	\$ 10.297	\$ 7.203
Operating Profit/Loss	\$ (1.847)	\$ (2.369)
Gross booking per user	\$ 547	\$ 506
% Revenues on Gross booking	20,68%	20,93%
Net Revenue/ user	\$113,15	
Operating expenses/ user	\$74,85	
Cost of acquiring new user based on 2018 from 2017	\$ 188,39	
Membership survival	95%	

(Source: own illustration based on Uber statement.)

Table 14 highlights the main calculation and assumptions of the model, as anticipated the membership survival over the years is 95% meaning that Uber will lose 5% of the existing customers over every year for the expected lifetime of a customer, which is 10 years. The revenue on Gross booking is 20,68 also called Take Rate meaning that the net revenue per user is \$113,15. For what concerns the discount rate, for existing user and the corporate expenses I took the one used in the DCF valuation for the first five years of 9,97%. To discount the value added by new users instead, I've assumed a 12% which is the ninth percentile of U.S. companies given the fact that new customers are riskier and keener on changing the platform respect the existing ones.

To value new users, as is possible to note looking at Table 16 I start with the value of existing user and net the cost of acquiring new users coming up with the valued added from new users, then multiply this value for the number of new users each year leads to a value added by new users. Thereafter, I discount the result to the present in order to arrive at the present value added by new users which is the second block of the valuation.

Then the company has to sustain expenses that are not directly related to the user, not only G&A but also corporate expenses to run the business.

Given no indication in the prospectus about corporate expenses I've assumed the corporate expenses to be \$1 billion, it's a pure assumption and might be highly speculative.

I take the present value of corporate expenses which are tax deductible and subtract from the sum of the value for existing and new users coming up with an enterprise value.

Table 15 – Operating expenses breakdown

Operating expenses	\$ 12.144	
Service existing users	\$ 6.811	56,09%
Corporate expenses	\$ 1.000	8,23%
Get new users	\$ 4.333	35,68%

Source: own illustration based on sample data

Table 15 shows the operating expenses breakdown. The total operating expenses are taken from the prospectus while operating expenses serving existing users are calculated under the assumption that the operating margin goes between the range 3-12%. In San Francisco, which is the oldest and most mature market for Uber, the operating margin is 10.1%³⁰, I've used then an average of 7% as the company total operating margin. Since the operating margin is what's left after these variable expenses, to serve the costumers, I subtract from the revenue per user the average operating margin under my assumption, which is 7% to derive the corporate expenses to serve existing customers.

Then the expenses to add new customers are just the difference between the total operating expenses and the sum between the expenses per actual users and corporate expenses.

³⁰ Uber's operating margin retrieved from FoxBusiness.com available at: <<https://www.foxbusiness.com/features/leaked-documents-show-ubers-cost-structure-best-performing-cities>>[Accessed 10 December 2019].

Table 16 – Rider-based valuation model, Ubers' projections.

Value of Existing Users	Years forecasted										
	2018	1	2	3	4	5	6	7	8	9	10
Membership Survival	1,00	0,95	0,90	0,86	0,81	0,77	0,74	0,70	0,66	0,63	0,60
Gross Billings	€ 547,24	€ 580,08	€ 614,88	€ 651,77	€ 690,88	€ 732,33	€ 776,27	€ 822,85	€ 872,22	€ 924,55	€ 980,03
Growth rate		6,00%	6,00%	6,00%	6,00%	6,00%	6,00%	6,00%	6,00%	6,00%	6,00%
Net Revenues	\$ 113,15	\$ 119,94	\$ 127,14	\$ 134,77	\$ 142,85	\$ 151,43	\$ 160,51	\$ 170,14	\$ 180,35	\$ 191,17	\$ 202,64
Operating Expenses	\$ 40,37	\$ 44,61	\$ 49,30	\$ 54,47	\$ 60,19	\$ 66,51	\$ 73,50	\$ 81,21	\$ 89,74	\$ 99,16	\$ 109,58
Operating Profit/user	\$ 72,78	\$ 75,33	\$ 77,84	\$ 80,30	\$ 82,66	\$ 84,91	\$ 87,02	\$ 88,93	\$ 90,61	\$ 92,01	\$ 93,07
Survival adjusted Operating Profit		\$ 71,56	\$ 70,25	\$ 68,84	\$ 67,33	\$ 65,70	\$ 63,96	\$ 62,10	\$ 60,11	\$ 57,99	\$ 55,72
After-tax Operating Profit/user	€ 54,59	€ 56,50	€ 58,38	€ 60,22	€ 62,00	€ 63,68	€ 65,26	€ 66,70	€ 67,96	€ 69,01	€ 69,80
Present Value		€ 51,38	€ 48,28	€ 45,28	€ 42,39	€ 39,60	€ 36,90	€ 34,29	€ 31,77	€ 29,34	€ 26,98
Annual Growth Rate (Revenues)	12,00%										
Annual Growth Rate (Op Exp)	10,50%										
Risk-adjusted discount rate	9,97%										
Life of user =	10,00										
Value per existing user =	€ 386,21										
Number of existing users =	91,00										
Value of Existing Users	€ 35.144,78										

Value of New Users

Cost of acquiring new user =	€ 188,39										
Value per new user (in today's \$) =	\$ 197,82										
	2018	1	2	3	4	5	6	7	8	9	10
Total Users	91,00	101,01	112,12	124,45	138,14	153,34	170,21	188,93	209,71	232,78	258,39
New Users	0,00	14,56	16,16	17,94	19,91	22,10	24,53	27,23	30,23	33,55	37,25
User growth rate		11,00%	11,00%	11,00%	11,00%	11,00%	11,00%	11,00%	11,00%	11,00%	11,00%
Value per new user	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82	\$197,82
Value added by new users		\$2.880,23	\$3.197,06	\$3.548,73	\$3.939,09	\$4.372,39	\$4.853,36	\$5.387,23	\$5.979,82	\$6.637,60	\$7.367,74
Terminal Value (new users)											\$110.516,07
Present Value		€ 2.571,64	€ 2.548,67	€ 2.525,92	€ 2.503,37	€ 2.481,01	€ 2.458,86	€ 2.436,91	€ 2.415,15	€ 2.393,59	€ 37.955,43
Value Added by New Users	\$ 60.290,54										

Value Drag of Corporate Expenses (Cost)

Corporate Expenses	-\$1.000,00	-\$1.100,00	-\$1.210,00	-\$1.331,00	-\$1.464,10	-\$1.610,51	-\$1.771,56	-\$1.948,72	-\$2.143,59	-\$2.357,95	-\$2.593,74
After-tax Corporate Expenses		-€ 825,00	-€ 907,50	-€ 998,25	-€ 1.098,08	-€ 1.207,88	-€ 1.328,67	-€ 1.461,54	-€ 1.607,69	-€ 1.768,46	-€ 1.945,31
Terminal Value (Corporate Exp)											-€ 23.608,09
PV of Corporate Expenses		-\$750,20	-\$750,41	-\$750,61	-\$750,82	-\$751,02	-\$751,23	-\$751,43	-\$751,64	-\$751,84	-\$9.878,85
Value Drag of Corporate Expenses	-\$16.638,06										

(Source: my valuation.)

Table 17 – Rider based valuation recap.

	<i>User Value</i>	<i>Asset value</i>	<i>Company Value</i>	<i>Equity Value</i>
Existing Users	€ 35.144,78			
New Users	€ 60.290,54			
User Value	\$ 95.345,32	€ 95.345,32		
(-) Corporate Expense Drag		-€ 16.638,06		
Uber Operating Assets		\$ 78.797,25	\$ 78.797,25	
+ Cash			€ 6.406,00	
+ Cross Holdings			€ 8.000,00	
Uber Firm Value			\$ 93.203,25	€ 93.203,25
- Debt				-€ 6.869,00
Uber's Equity Value				\$ 86.334,25
Value per Share				\$ 51,31

(Source: my valuation)

Table 17 summarizes the outcome of the model of \$51,31 per share, above the \$45 IPO price. This is another approach to value a company and my estimates might be more or less precise, but I want to stretch the point on the sensitivity analysis in Table 18 which brings us to a problem companies like Uber have to face sooner or later in the future. From the value added by new users the starting point is the actual cost of \$197,82 and I subtract \$50 on each column on the left and I add \$50 on each column on the right. From the CAGR in revenue my starting point is 11% used in the model and I subtract or add 5% to build the 5 ranges. Looking at the table, is possible to see that the more the company is able to increase the users the more the total value added, and the same happens if the company increases the value added per user having the constant growth rate. This table though helps to answer the following question: would the company rather go after at 6% user’s growth rate and \$297 value per new user or 21% user growth rate and \$97 value per new users? Companies sometimes might have to make a trade off: the growth dilemma. Clearly faster growth leads to a higher total value and

whenever the company is able to keep those higher growth rates, it has to focus on it and give up some value per user.

Table 18 – Sensitivity analysis on value added by new users and growth in revenues

		Value added by new user				
		\$ 97,82	\$ 147,82	\$ 197,82	\$ 247,82	\$ 297,82
CAGR in Users	1%	\$ 10.308	\$ 15.577	\$ 20.846	\$ 26.115	\$ 31.384
	6%	\$ 17.444	\$ 26.360	\$ 35.276	\$ 44.192	\$ 53.108
	11%	\$ 29.813	\$ 45.052	\$ 60.291	\$ 75.530	\$ 90.769
	16%	\$ 50.443	\$ 76.227	\$ 102.011	\$ 127.795	\$ 153.579
	21%	\$ 83.732	\$ 126.532	\$ 169.331	\$ 212.130	\$ 254.929

(Source: own illustration.)

UBER PRICING BASED ON LYFT

Before Uber became public, only one company who can be defined as a competitor was already present in the stock market: Lyft. Given the complexity and the novelty of the business model it was likely that the market wasn't very experienced in valuing those companies, and I've always wondered if the price of Uber was somehow correlated with the previously listed competitor Lyft.

In order to understand the overpricing of Uber, I wanted to investigate if the price was influenced by Lyft's IPO and if the company was priced according to the rival company. Therefore, as it's possible to see from the table 17, I took Lyft's price the 10th of May 2019 (Uber's debut in the public market) of \$56,40 and computed the most important metrics for the ride-sharing sector. Gross Bookings, revenue, the riders and drivers, the number of trips and the number of cities where those companies operate.

First thing looking at the table 17 is the dimension: Uber has five times the Net Revenues of Lyft, six times the Gross Bookings and almost five times the number of riders but is also losing more money. Despite Lyft operates only in the U.S market, Uber claims to be a worldwide company and is operating in more than two time the cities of its biggest competitor.

Table 19 – Metrics to derive Uber’s price based on Lyft.

	<i>Equity Value (Market Cap)</i>	<i>Enterprise Value</i>	<i>Gross Billings</i>	<i>Net Revenue</i>	<i>EBIT</i>	<i>Riders</i>	<i>Drivers</i>	<i>Rides</i>	<i>Cities</i>
Lyft	€ 16.153	€ 14.653	€ 8.054	€ 2.156	-€ 911,00	18,6	1,10	714	350
Uber	?	?	€ 49.799	€ 10.927	-€ 1.847,00	91	3,90	5220	735

Source: Yahoo Finance

Table 19 shows for each metrics the Lyft multiple calculated, and then I’ve used these multiples to derive a value of Uber.

Lyft trades for about 1,81 times gross bookings, applying the same multiple to Uber gross billings I came up to \$90 billion Enterprise Value for Uber, added cash, cross holdings and subtracted debt to arrive at an equity value around \$98 billion, which divided for the outstanding shares led to do a per share value of 58,31. As you can see Table 20, different metrics give different per share values therefore it’s not worth to look at one value as a standalone but looking at them together helps having a different vision about the company. Clearly, respect to a DCF model which bases its estimates on fundamentals, here values are dragged from Lyft price which is usually more speculative and arbitrary than just value. Taking the 7 Uber’s value per share and computing the average leads to a value of \$46,71 which is very close to the initial Uber’s value of \$45. The fact that Uber has been priced according to Lyft instead of valued based on fundamentals could then be one of the reasons of that high price.

Table 20 – Uber different prices per metrics.

	<i>Lyft Multiple</i>	<i>Uber EV (based on Lyft Pricing)</i>	<i>Uber Equity Value</i>	<i>Per Share Value</i>
EV/Gross Bookings	1,82	\$ 90.601	\$ 98.138,29	\$ 58,31
EV/Revenue	6,80	\$ 74.264	\$ 81.800,87	\$ 48,60
EV/Rider	\$ 787,79	\$ 71.689	\$ 79.226,21	\$ 47,07
EV/Driver	\$ 13.320,87	\$ 51.951	\$ 59.488,40	\$ 35,35
EV/Ride	\$ 20,53	\$ 107.187	\$ 114.723,73	\$ 68,17
EV/City	\$ 41,87	\$ 30.771	\$ 38.308,22	\$ 22,76
AVG PRICE				\$ 46,71

(Source: own illustration based on Lyft & Uber data.)

4.5 - THE REASONS BEHIND THE FAILURE

In the last paragraphs I tried to analyse the company's path before the IPO, the company's financials, the IPO event and how the company performed after the IPO. After that, it's been presented a valuation of the company through the DCF model and with a differ valuation approach based on the user base value. Here I want to analyse the reasons behind the IPO failure and why the company's stock has performed so bad since its IPO.

Overconfidence: Overconfidence is one the requirements to be a good entrepreneur or a good manager and as long as things go well this sentiment feeds on success.

The rapid growth Uber has shown during its quite little life boosted the confidence of the insiders through the life of the company which translated in higher valuations. Before the IPO indeed, the company reached higher valuation through private financing, which were even bigger than the actual market capitalization. According to Craft³¹, last private valuation was given by Toyota, leading to a post money value around \$76 billion.

Overpricing then should decrease over time because as long as the market evolve, when the potential and size become more clear defining who survived and who didn't. In Uber's case the correction of the market happened very quickly, and investors are still sceptical about the future of the company.

Big market promise: It's well known that companies, especially tech companies got used to define their potential markets as big as possible. Since is not that easy to prove evidence just with words they started to put down numbers beside those words. Uber in the prospectus defined itself in a personal mobility business instead of just (or mostly) a ride-sharing company which allowed the company to include everything related to transport. Doing so, the company put itself in a position to include in their Total Addressable Market a value bigger than \$6 trillion dollar meaning that if the company would be able to reach a small % of the total market, it could easily be worth tenth of billion.

Disclosure weren't exhaustive at all: Uber is a well-known ride sharing company, but it didn't disclose keys information like how many drivers have there been over time, the exact amount of passenger rides and restaurant deliveries (they summed up everything in the 91 million of platform users), differences between ride-sharing trips values and restaurant deliveries.

³¹*Uber funding rounds, valuation and investors* retrieved from Craft, available at <<https://craft.co/uber/funding-rounds>> [Accessed 12 December 2019]

This becomes even worse with uncertainty and not comparability, indeed if the market size is unclear, it led overoptimistic entrepreneurs and venture capitalists to inflate the market with unreasonable valuations. The promise presence of big markets translates in high growth rates, which combined with a solid profitable business lead to huge valuations. With Uber it was the same, investors based on those expectation bided up the price and as soon they've assessed the real earnings potential of the market, and more specifically the company, they've realized it wasn't worth the price and they started to sell.

Another aspect to consider is that Uber waited a lot to become a public company thanks to venture capitalists who, financing the company, allowed to keep it alive and grow, make business acquisitions and invest in research and development even spending a lot of money. Those financing stages raised the company value over time without following the real value as if it was already publicly traded, and that ended up in an overvaluation at the time of the IPOs.

Kathleen Shelton Smith, the co-founder of Renaissance Capital said that companies such Uber and Lyft, in order to be conservatively priced, they should have been valued at prices lower than the latest private round of funding, which is quite impossible because venture capitalist need to be rewarded otherwise there is no point in going public.

In the literature, this is explained by the window-dressing hypothesis. According to this theory, prior an IPO's managers try to manipulate a firm's result (Teoh, Welch and Wong, 1998). The aim is to make the financial performances of the company look better than how they really are, in order to maximize the firm's stock price just in time for the IPO. However, behaviour hasn't a long-term vision indeed the benefits of gaining the highest share price possible occur only to the existing shareholders in the short-run. After years of losses, the 2018 Uber's statement presented a positive income of roughly \$1 billion but as soon as the company released data after the IPO, the market corrected the expectations and the price dropped.

Growth is not enough: Uber operates in sectors where there is a huge growth potential, but they underestimated that this growth has to be shared with existing and new potential competitors. Ride-sharing doesn't allow to a worthwhile differentiation of the brand from the others. A good portion of drivers work both for Lyft and Uber and they constantly seek the greater profit because they don't feel the difference in service. Same happens for consumers who are always seeking the best price, all of this is allowed since there are no obstacles on

frequent platform changes. If the company can't build solid loyalty (and if it does, it's through a lot of money-spending), how's that supposed to attract and lock-in drivers and riders?

Uber's business model should have been the pillar of the company's future, but the company put light only on growth and growth potential. The truth is that Uber is still a cash burning company: Q3 of 2019 reported a \$1.2 billion loss which is 18% more than what the company has lost in the same quarter the previous year. According to Renaissance Capital, in the recent years Uber is the company who lost more money during the 12 months before its IPO and Lyft was third on that ranking.

Ride-sharing business do not offer room for economies of scale. It's not a capital-intensive business where there is need to own assets and most of the costs are variable, meaning that even if the volume of rides increases, it's unlikely to happened with huge savings in costs.

Indeed

What the share price told us is that investors now are different from venture capitalists, they are looking for a clear path to profitability and they think it's time for the company to change the path, stop burning money to increase the market share because customers can easily change platform. Instead, they are looking for a solid business model, a reliable strategy because growth standalone takes nowhere.

Cornelli and Damodaran (2019) in their paper called "The Big Market Delusion: Valuation and Investment Implications" present three case studies: the internet retail sector in the 1990s, the online advertising space in 2015, and the cannabis market in 2019 after the legalisation of cannabis in Canada and in many U.S. states. These markets had in common the fact that they showed the same characteristics: big market optimism, overpricing and then market correction who brought back speculative price to a more attention in valuation. Internet companies in the 90s based their pricing pitch on how quickly they were growing, social media companies based their pricing on growth in users and subscribers and same happened for the cannabis companies, which saw increasing the total addressable market after the legalisation of the product. Sooner or later the market brought back those companies to reality, and that's what happened for Uber, even in a more rapid way.

Pricing metrics: As I did for my second valuation, metrics to define the price depends on the business: Social media companies like Facebook or Twitter have been priced not upon profits or revenues but according to the users of the platform and that was one of the main drivers of the valuation also for Uber because a company like that can't easily work on margin, it has to go with volume and hope to reach profitability. Uber's CEO Dara Khosrowshahi said in an

interview that 2019 should be the worst year in terms of losses and they project to turn an EBITDA profitability in 2021. At first, to become solid and a reliable company Uber has to capture a consistent portion of that big market then it has to generate profit in this big market and create value from this growth (as shown by the sensitivity analysis on the rider based valuation), and lastly has to be able to keep new entrants out which is not easy and it's still a painful point to work on. The problem is under the lens of everyone: a business who's losing money has two things to do: either cut the expenses or raise the prices. The biggest expense for Uber is a variable cost which is the driver who gets 80% of how much the customer pays to the company, and the rest 20% is the revenue that has to be netted from the costs. To turn into profit companies can cut the driver's pay which is a delicate argument or raise the fares, but for customers is easy to switch platform making it hard to do so.

CONCLUSION

The aim of this thesis was to investigate the reasons behind the failure of Uber's IPO. To do so, it has been pointed a focus on 2019 IPOs and in particular on technology IPOs to better understand their level of initial return and find out which are the most important features of technology firms influencing IPO underpricing.

The analysis performed shows a positive patten in the number of IPOs in the last three years as well as in terms of underpricing. In fact, the average first day return recorded for the 149 IPOs in 2019 is 19,37%, higher than the last 10 years average of 15,88%.

According to the theories of Loughran and Ritter (2004) that IPO volumes and underpricing are cyclical, there have been periods with low volume of offering like 2011 and 2016 with respectively 82 and 78 companies went public and periods like 2014 when 225 companies offered their shares to the public. In line with literature's findings that IPOs occurs in waves depending on the market conditions, the analysis of the two biggest U.S. stock indexes confirmed that the market conditions were favourable incentivizing a considerable amount of companies to go public. In fact, S&P 500 and NASDAQ-composite reached growth rates never seen before.

The analysis of 2019 IPOs confirms that on average, technology firms are more underpriced than the rest of the companies with a first day return of 25,92% respect the average of the total sample of 19,37%. Technology IPOs were 31 out of 149 representing the 21% of the total, below the previous years of 41 companies but in line with the average of the last 10 years of 34 companies.

Dividing technology companies by profitability, 11 of them went public with already positive earnings and the other 20 were still making losses.

In conformity with the findings of Chalk & Peavy (1990), the size can also be a factor influencing the initial return sustaining that larger IPOs are generally less underpriced. In fact, it has been found that profitable companies at the time of the IPO had an average market capitalization of almost \$10 billion and an average initial return of 13,06% respect the unprofitable firms who had on average \$5 billion of market capitalisation and an underpricing of 32,99%.

Regarding the age of the companies, the literature found a negative relation between the age and the level of underpricing. Ritter (1984,1991) sustained that the two main reasons of this

negative relationship are the higher ex-ante uncertainty because the market is less likely to follow young companies, and because financial data are not available or not present long enough to compare them. In fact, technology companies already profitable at the time of the listing were 5 years older than the unprofitable ones, recording a differential on underpricing around 20%. Nevertheless, Uber seemed to be an outlier. It went public with a positive income having already a huge market capitalisation of \$81 billion but the performance of its IPO was completely different with most of the other technology companies listed in the 2019. I performed a DCF valuation and a rider-based valuation to understand the real value of the companies and the reasons behind that performance.

From the analysis of Uber's IPO case, I concluded that the principal reason behind the failure was the company overvaluation at the time of the IPO, with financial projections not reflecting the real potential of the company. This was mainly due to the overconfidence of early investors and venture capitalist who in private gave higher valuation of the company and wanted to be rewarder from the IPO. This was not the only factor, in fact, as reflected by the prospectus Uber leveraged on the growth potential and on the promise of a big market to serve, confusing the investors from the real value and fundamentals. Another aspect to consider is that they received several funding rounds leading to a slow overvaluation each time. The business model is high risky and subject to an increasing competition over time, and at the same time the company is still losing billions of dollars.

The limitations of this research are primarily connected to the sample utilized: I analysed IPOs performed in the period from 2010 to 2019 and listed on NASDAQ and NYSE, but I did not take into account IPOs performed in the previous years and IPOs listed outside U.S. on other stock exchanges. The limitations are also connected to the type of analysis performed: the descriptive analysis summarizes and quantitatively describes sample data, it is useful to point out potential relations between the variables analysed, but it does not allow to discover precisely which variables are significantly related to the level of IPO underpricing.

REFERENCES

- AGGARWAL, R., 2000. Stabilization activities by underwriters after initial public offerings. *The Journal of Finance*, 55(3), 1075-1103.
- AGGARWAL, R., LEAL, R., HERNANDEZ, L., 1993. The aftermarket performance of initial public offerings in Latin America. *Financial Management*, 42-53.
- AKERLOF, G. A. 1970. The market for "lemons": quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(3), 488-500.
- ANAND, A.I., 2005 *Is the Dutch Auction IPO a Good Idea?* Working Paper, Expresso Preprint Series.
- ASQUITH, D., JONES, J. D., KIESCHNICK, R., 1998. Evidence on price stabilization and underpricing in early IPO returns. *The Journal of Finance*, 53(5), 1759-1773.
- BAKER, M.P., and WURGLER, J., 2002. Market timing and capital structure. *Journal of Finance*, 57, 1-32.
- BANERJEE, S., DAI, L., SHRESTHA, K., 2011. Cross-country IPOs: what explains differences in underpricing? *Journal of Corporate Finance*, 17(5), 1289-1305.
- 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., HOLMSTROM, B., 1980. The investment banking contract for new issues under asymmetric information: delegation and the incentive problem. *The Journal of Finance*, 35(5), 1115-1138.
- BARRY, C. B., MUSCARELLA, C. J., PEAVY, J. W., & VETSUYPENS, M. R., 1990. The role of venture capital in the creation of public companies: Evidence from the going-public process. *Journal of Financial economics*, 27(2), 447-471.
- BEATTY, R. P., RITTER, J. R., 1986. Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics*, 15(1-2), 213-232.
- BELLER, A.L., TERAJ, T., LEVINE, R.M., 1992. Looks can be deceiving: A comparison of initial public offering procedures under Japanese and U.S. securities laws. *Law and Contemporary Problems* 55, 77-118.
- BENVENISTE, L. M., SPINDT, P. A., 1989. How investment bankers determine the offer price and allocation of new issues. *Journal of financial Economics*, 24(2), 343-361.
- BHABRA, H. S., and PETTWAY R. H., 2003. IPO prospectus information and subsequent performance. *Financial Review*, 38(3), 369-397.

- BOMANS, R.B., 2009. IPO underpricing in Europe; a comparison between technology and non-technology IPOs. <<http://dare.uva.nl/cgi/arno/show.cgi?fid=143696>> [Accessed 10 December 2019]
- BOOTH J. R., CHUA, L. 1996. Ownership dispersion, costly information, and IPO underpricing. *Journal of Financial Economics*, 41(2), 291-310.
- BOTOSAN, C., 1997 Disclosure level and the cost of equity capital. *Accounting Review* 72 (3): 323–349.
- BOTSMAN, R., 2017. *Who can you trust? How technology brought us together—and why it could drive us apart*. Penguin UK.
- BRAU, J., FAWCETT, S., 2006. Evidence on What CFOs Think About the IPO Process: Practice, Theory, and Managerial Implications. *Journal of Applied Corporate Finance*, 18(3), 107-117.
- BRENNAN, M. J., FRANKS, J. 1997. Underpricing, ownership and control in initial public offerings of equity securities in the UK. *Journal of Financial Economics*, 45(3), 391-443.
- CARTER, R., DARK, F., SINGH. A., 1998. Underwriter reputation, initial returns, and the longrun performance of IPO stocks. *The Journal of Finance*, 53(1), 285-311.
- CHALK, A., PEAVY, J., 1990. Understanding the pricing of initial public offerings. *Research in Finance*, 8(2), 203-240.
- CHEMMANUR, T. J., HE, J., 2011. IPO waves, product market competition, and the going public decision: Theory and evidence. *Journal of Financial Economics*, 101(2), 382-412.
- CHEMMANUR, T. J., FULGHIERI, P., 1999. A theory of the going-public decision. *The Review of Financial Studies*, 12(2), 249-279.
- ČORNANIC, A., NOVAK, J., 2015. Signaling by underpricing the initial public offerings of primary listings in an emerging market. *Czech Journal of Economics and Finance*, 65(4), 307-335.
- CORNELL, B., DAMODARAN, A., 2019. The Big Market Delusion: Valuation and Investment Implications. Available at SSRN 3501688.
- CORNELLI, F., GOLDREICH, D., 2001. Bookbuilding and strategic allocation. *Journal of Finance* 56, 2337–2369.
- CORNELLI, F., GOLDREICH, D., 2003. Bookbuilding: How informative is the order book? *Journal of Finance* 58, 1415–1443.
- CORWIN, S. A., and HARRIS H. J., 2001. "The initial listing decisions of firms that go public." *Financial Management*, 30(1), 35-55.

- DORN, D., 2009. Does sentiment drive the retail demand for IPOs? *The Journal of Financial and Quantitative Analysis*, 44(1), 85-108.
- DRAHO, J., 2004. *The IPO Decision: Why and How Companies Go Public*. Cheltenham [u.a.]: Edward Elgar Publishing.
- DRAKE, P. D., VETUYPENS, M. R. 1993. IPO underpricing and insurance against legal liability. *Financial Management*, 22(1), 64-73.
- ECKBO, B. E., 2008. *Handbook of empirical corporate finance set* (Vol. 1). Elsevier.
- ELLIS, K. 2006. Who trades IPOs? A close look at the first days of trading. *Journal of Financial Economics*, 79(2), 339-363.
- FELSON, M., SPAETH, J., 1978 Community Structure and Collaborative Consumption: A routine activity approach. *American Behavioural Scientist*, 21(4): 614–624.
- FERNANDO, C., KRISHNAMURTHY, S., and SPINDT. P. A., 1999. Offer Price, Target Ownership Structure and IPO Performance. *The Wharton School, University of Pennsylvania*.
- FINN, F. J., HIGHAM, R., 1988. The performance of unseasoned new equity issues-cum-stock exchange listings in Australia. *Journal of Banking & Finance*, 12(3), 333-351.
- GEDDES, R., 2003. *IPOs and equity offerings*. Oxford: Butterworth-Heinemann.
- GOMPERS, P. A., 1996. Grandstanding in the venture capital industry. *Journal of Financial Economics*, 42(1), 133-156.
- GOMPERS, P., METRICK, A., 1998. How are large institutions different from other investors? Why do these differences matter? *Working paper, Harvard Business School*.
- HABIB, M., LJUNGQVIST, A., 2001. Underpricing and entrepreneurial wealth losses in IPOs: theory and evidence. *Review of Financial Studies*, 14 (2): 433-458.
- 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., WILHELM, W.J., 1995. Evidence on the strategic allocation of initial public offerings. *Journal of Financial Economics* 37, 239–257.
- HENSLER, D.A., 1995. Litigation costs and the underpricing of initial public offerings. *Managerial and Decision Economics* 16, 111–128.

- HITT, M. A., IRELAND, R. D., HOSKISSON, R. E., 2012. *Strategic management cases: competitiveness and globalization*. Cengage Learning.
- HOWSON, P., 2017. *Due diligence: The critical stage in mergers and acquisitions*. Routledge.
- HUGHES, P. J., 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 [u.a]: Springer.
- IBBOTSON, R. G., 1975. Price performance of common stock new issues. *Journal of financial economics*, 2(3), 235-272.
- JEGADEESH, N., WEINSTEIN, M., Welch, I., 1993. An empirical investigation of IPO returns and subsequent equity offerings. *Journal of Financial Economics* 34, 153–175.
- JENKINSON, T., LJUNGQVIST, A., LJUNGQVIST, A. P., 2001. *Going public: The theory and evidence on how companies raise equity finance*. Oxford University Press on Demand.
- JENKINSON, T.J., 1990. Initial public offerings in the United Kingdom, the United States, and Japan. *Journal of the Japanese and International Economies* 4, 428–449.
- JENKINSON, T.J., JONES, H., 2004. Bids and allocations in European IPO bookbuilding. *Journal of Finance* 59, 2013–2040.
- KARLIS, P. L., PETER, L., 2000. *IPO Underpricing*. The Park Place Economist: Vol. 8 <<http://digitalcommons.iwu.edu/parkplace/vol8/iss1/17>>. [Accessed 10 January 2020]
- KATTI, S., PHANI, B. V., 2016. Underpricing of initial public offerings: a literature review. *Universal Journal of Accounting and Finance*, 4(2), 35-52.
- KAUSTIA, M., KNUPFER, S. 2007. *Do investors learn from personal experience? Evidence from IPO subscriptions*. Working Paper.
- KEASEY, K., SHORT, H., 1992. The winner's curse model of underpricing: a critical assessment. *Accounting and Business Research*, 23(89), 74-78.
- KOH, F., WALTER, T. 1989. A direct test of Rock's Model of the pricing of unseasoned issues. *Journal of Financial Economics*, 23(2), 251-272.
- KUCUKKOCAOGLU. G., 2008. “Underpricing in Turkey: A Comparison of the IPO Methods.” *International Research Journal of Finance and Economics*, 13 (2), 162-182.
- KUNZ, R.M., AGGARWAL, R., 1994. Why initial public offerings are underpriced: Evidence from Switzerland.

Journal of Banking and Finance 18, 705–724

LEE, P. J., TAYLOR, S. L., WALTER, T. S., 1996. Australian IPO pricing in the short and long run. *Journal of Banking & Finance*, 20(7), 1189-1210.

LEVIS, M., 1990. The Winner's Curse Problem, Interest Costs and the Underpricing of Initial Public Offerings. *The Economic Journal*, 100(399), 76-89.

LJUNGQVIST, A. P., 1997. Pricing initial public offerings: Further evidence from Germany. *European Economic Review*, 41(7), 1309-1320.

LJUNGQVIST, A., WILHELM, W. J., 2003. IPO pricing in the dot-com bubble. *The Journal of Finance*, 58(2), 723-752.

LJUNGQVIST, A., WILHELM, W.J., 2002. IPO allocations: Discriminatory or discretionary? *Journal of Financial Economics* 65, 167–201.

LOGUE, D. E., 1973. Premia on unseasoned equity issues. *Journal of Economics and Business*, 25(3), 133-141.

LOUGHRAN, T., 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.

LOUGHRAN, T., RITTER, J. R., 2004. Why has IPO underpricing changed over time? *Financial Management*, 33(3), 5-37.

LOUGHRAN, T., RITTER, J. R., RYDQVIST, K., 2018 Initial Public Offerings: International Insights. *Pacific-Basin Finance Journal* Vol. 2, pp. 165-199

LOWRY, M., SHU, S., 2002. Litigation risk and IPO underpricing. *Journal of Financial Economics*, 65(3), 309-335.

LOWRY, M., (2003). Why does IPO volume fluctuate so much? *Journal of Financial Economics*, 67, 3-40.

LOWRY, M., SCHWERT, G. W., 2002. IPO market cycles: Bubbles or sequential learning? *The Journal of Finance*, 57(3), 1171-1200.

LUCAS, D., MCDONALD, R., 1990. Equity Issues and Stock Price Dynamics. *The Journal of Finance*, 45(4), 1019-1043.

MICHAELY, R., SHAW, W.H., 1994. The pricing of initial public offerings: Tests of adverse-selection and signalling theories. *Review of Financial Studies* 7, 279–319.

MUSCARELLA, C.J., VETSUYPENS, M.R., 1989. A simple test of Baron's model of IPO underpricing. *Journal of Financial Economics* 24, 125–135.

NGUEMA, J. F., SENTIS, P., 2006. IPO Underpricing Across the World: Does the Country Risk Matter.

- PAGANO, M., PANETTA, F., ZINGALES, L., 1998. Why Do Companies Go Public? An Empirical Analysis. *The Journal of Finance*, 53(1), 27-64.
- PICKER, L., CHEN, L., 2014. *Alibaba's Banks Boost IPO Size to Record of \$25 Billion*. Retrieved from Bloomberg :<https://www.bloomberg.com/news/articles/2014-09-22/alibaba-s-banks-said-to-increase-ipo-size-to-record-25-billion>
- REBER, B., VENCAPPA, D., 2016. Deliberate premarket underpricing and aftermarket mispricing: New insights on IPO pricing. *International Review of Financial Analysis*, 44, 18-33.
- REILLY, F. K., HATFIELD, K. 1969. Investor experience with new stock issues. *Financial Analysts Journal*, 25(5), 73-80.
- RITTER, J. R., WELCH, I., 2002. A review of IPO activity, pricing, and allocations. *The Journal of Finance*, 57(4), 1795-1828.
- ROCK, K., 1986. Why new issues are underpriced. *Journal of Financial Economics*, 15(1-2), 187-212.
- RYDQVIST, K., 1994. *Compensation, participation restrictions and the underpricing of initial public offerings*. Mimeo, Stockholm School of Economics.
- SCOTT, J., 1976. A Theory of Optimal Capital Structure. *The Bell Journal of Economics*, 7(1), 33.
- SHEFRIN, H., 2002. *Beyond Greed and Fear: Understanding Behavioural Finance and Psychology of Investing*. Oxford University press.
- SHERMAN, A. E., Titman, S., 2002. Building the IPO order book: underpricing and participation limits with costly information. *Journal of Financial Economics*, 65(1), 3-29.
- SHERMAN, A.E., 2001 "Global Trends in IPO methods: Bookbuilding vs. Auctions." Working Paper, University of Notre Dame.
- 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.
- SMART, S. B., & ZUTTER, C. J., 2003) Control as a motivation for underpricing: a comparison of dual and single-class IPOs. *Journal of Financial Economics*, 69(1), 85-110.
- SPIESS, K., AFFLECK-GRAVES, J., 1995. The long-run performance following seasoned equity issues. *Journal of Financial Economics*, 38(3), 243-67.

STOUGHTON, N. M., & 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.

THALER, R., 1980. Toward a positive theory of consumer choice. *Journal of Economic Behaviour and Organization* 1, 39–60.

TEOH, S. H., WELCH, I., WONG, T. J., 1998. Earnings management and the long-run market performance of initial public offerings. *Journal of Finance*, 53(1), 1935–1974.

UHLIR, H., 1989. Going public in the FRG. In *A reappraisal of the efficiency of financial markets* (pp. 369-393). Springer, Berlin, Heidelberg.

VAN DER GOOT, T., 2003. Risk, the quality of intermediaries and legal liability in the Netherlands IPO market. *International Review of Law and Economics*, 23(2), 121-140.

WELCH, I., 1989. Seasoned offerings, imitation costs, and the underpricing of Initial Public Offerings. *The Journal of Finance*, 44(2), 421-449.

WELCH, I., 1992. "Sequential Sales, Learning and Cascades." *Journal of Finance*, 47(1), 695-732.

WELCH, I., 1996. Equity offerings following the IPO theory and evidence. *Journal of Corporate Finance*, 2(3), 227-259.

ZINGALES, L., 1995. Insider ownership and the decision to go public. *The Review of Economic Studies*, 62(212), 425-448.