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**"AN ANALYSIS OF UNDERPRICING OF INTERNET-RELATED IPOs
AND THE FACEBOOK IPO CASE"**

RELATORE:

CH.MO PROF. ELENA SAPIENZA

LAUREANDO: MARCO MARTINELLO

MATRICOLA N. 1130327

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INDEX

INTRODUCTION	4
CHAPTER 1 - HOW TO GO PUBLIC.....	8
1.1 - WHAT IS AN IPO?.....	8
1.2 - WHY DO PRIVATE COMPANY DECIDE TO GO PUBLIC?.....	8
1.3 - THE IPO PROCESS	9
1.4 - THE COST OF AN IPO.....	20
CHAPTER 2 - IPO UNDERPRICING.....	22
2.1 - UNDERPRICING PHENOMENON	22
2.2 - REASONS AND THEORIES FOR IPO UNDERPRICING.....	23
2.3 - FACTORS THAT AFFECT THE LEVEL OF UNDERPRICING	34
2.4 - MARKET TIMING OF IPO AND THE IMPACT ON THE LEVEL OF UNDERPRICING	37
2.5 - UNDERPRICING IN DIFFERENT COUNTRIES AND IN DIFFERENT ECONOMIC SECTORS.....	39
2.6 - THE LONG-RUN PERFORMANCE OF INITIAL PUBLIC OFFERINGS	41
CHAPTER 3 – EMPIRICAL RESEARCH ON INTERNET IPOs	44
3.1 - INTRODUCTION	44
3.2 - DATA AND DATA SOURCES	46
3.3 - VARIABLES DESCRIPTION.....	47
3.4 - DESCRIPTIVE ANALYSIS.....	48
3.5 - RESULTS	60
CHAPTER 4 – THE FACEBOOK IPO CASE	63
4.1 - INTRODUCTION	63
4.2 - FACEBOOK BEFORE THE IPO	64
4.3 - THE FACEBOOK IPO PROCESS.....	76
4.4 - THE VALUATION OF FACEBOOK	81
4.5 - THE REASONS BEHIND THE “FAILURE” OF THE IPO.....	86
CHAPTER 5 - CONCLUSION	93
APPENDICES.....	95
APPENDIX A	95
APPENDIX B	97
APPENDIX C.....	99
BIBLIOGRAPHY	100

INTRODUCTION

An initial public offering (IPO) is the process through which an unlisted company (a privately held company) sells for the first time its shares to the public and becomes listed on a stock exchange. It is one of the most important events in the life of a company: as stated by Zingales (1995), the IPO is generally the largest equity issue that a company ever makes. An initial public offering allows firms to raise new equity capital necessary to finance their growth plans and permits pre-IPO owners to monetize part of their investments in the firm, using the offering as an exit strategy. Going public also guarantees significant intangible benefits to the companies: better reputation, increased visibility and higher prestige that can provide marketing and commercial advantages, strengthen the relationships with costumers and suppliers, and facilitate the recruitment of more qualified manager and employees. Nevertheless, the process of going public is complex and time-consuming; the transition from private to publicly traded company is not easy and generates several changes: the transformation of the firm's ownership structure, a loss of management control, an increase in the disclosure requirements and in regulatory oversights. IPO requires a long preparation and its success strictly depends on the planning of the whole process and on the decisions taken by the issuing firm and by the underwriter.

The existence of IPO underpricing phenomenon has been well-documented by literature. IPOs are underpriced when shares are offered to investors at prices that are below the prices at which shares trade on the stock exchange the first day of listing. Underpricing is considered an opportunity costs for firms going public since issuers selling shares at an offer price lower than their potential market value, are "leaving money on the table". The first to analyse this phenomenon related to initial public offerings were Reilly (1973) and Ibbotson (1975); in the last forty years, IPO underpricing has been discussed in several scientific papers and different theories have been developed to understand and explain its causes. Most studies have described and analysed underpricing in the US stock market, but, although 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 studied market. Ritter and Welch (2002) showed that US IPOs conducted in the period from 1980 to 2001 had an average first-day return of 18.8%; while Loughran and Ritter (2004) demonstrated that the level of underpricing is cyclical: they found that the average first day return was 7% in the 1980s, 15% in the years 1990-1998, 65% during the "Dot-com bubble" (1999-2000) and 12% in the period 2001-2003. Additionally, Jenkinson

and Ljungqvist (2001) concluded that the IPO first day return is approximately 15% in industrialized countries and, on average, 60% in emerging markets.

It is not possible to identify a single theory able to provide an exhaustive explanation of this phenomenon; past researches have offered different models that study IPO underpricing and that examine the factors influencing the level of first day return. The most important theories are focused on asymmetric information between issuing firms, underwriters and investors. The best-known model that studies information asymmetries between investors is Rock's (1986) "winner's curse". Investors can be classified into "informed" and "uninformed" and, according to Rock, issuing firms need to underprice their shares to attract uninformed investors to participate in the IPO, because underpricing ensures them a reasonable return for their ex-ante uncertainty. Indeed, ex-ante uncertainty about the value of the firm is related with the degree of underpricing and, as shown by Beatty and Ritter (1986), the greater the ex-ante uncertainty, the greater the expected underpricing. Baron (1982), instead, analysed information asymmetries between issuing firms and underwriters; Baron's model assumes that investment banks have superior information and that issuing firms rationally allow underwriters to underprice, to compensate them for the use of their superior information about the demand level for the shares offered in the IPO.

According to "Information Revelation theories", institutional investors have superior information than the issuer and the investment banks: Benveniste and Spindt (1989) introduced "information gathering theories" and showed that book-building is an appropriate mechanism to reduce uncertainty and information asymmetries and that issuing firms deliberately underprice because, in the absence of underpricing, investors would not have interests in revealing their private positive information. Cornelli and Goldreich's (1999) and Hanley's (1993) findings supported "information gathering theory"; they demonstrated that underwriters allocate large fractions of shares to investors that reveal information and that new positive information collected is only partially incorporated in the final offer price. Instead, "Signaling theory" assumes that companies have better information about firms' prospects and value than investors. Signaling theory was introduced by Spence (1973) and Ibbotson (1975) and then developed by Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989). They all concluded that underpricing is used by good quality firms to signal their value and convince potential subscribers of their high quality: this is a credible signal because only high-quality firms can recoup the initial loss associated with IPO underpricing.

Other different categories of theories built to explain the underpricing phenomenon are the following: "Ownership Dispersion theories" were developed by Zingales (1995), Booth and

Chua (1996), Brennan and Franks (1997) and investigate the relation between ownership's structure changes and IPO underpricing; "Lawsuit Avoidance theories" were introduced by Logue (1973) and Ibbotson (1975) and supported by Tinic (1988), Hughes and Takhor (1992), Lowry and Shu (2002) and state that IPO underpricing is used as a mean of insurance against legal liability and reputation damage, and that litigation risks induce firms and investment banks to underprice; finally, "Behavioural theories" were built by Welch (1992) and Ritter (1998) and assert that underpricing is the result of investors' behavioural biases. In addition to the theories regarding the reasons why companies leave money on the table, there are also other studies that analyses the main variables that affect the level of first day return: Beatty and Ritter (1986) examined the relation between the degree of underpricing and the ex-ante uncertainty about company's value, Logue (1973) and Titman and Trueman (1986) studied the relation between underpricing and the reputation of the underwriter, while Sindelar, Ritter and Ibbotson (1994) analysed the IPO market cycles and their impact on the level of underpricing.

Some of the most important and largest IPOs occurred in recent years are internet-related IPOs. Among the most important and relevant IPOs of the last 15 years, the following are internet-IPOs: Google IPO (2004), Facebook IPO (2012), Alibaba IPO (2014), Twitter IPO (2013), Groupon (2013), Snapchat (2017). In this thesis, I decided to analyse IPOs in the internet sector, since the available literature on internet-related IPOs is mainly focused on the period of the Internet Bubble (1999-2001) and on the comparison between internet and non-internet IPOs. Ljungqvist and Wilhelm (2002) studied the causes of the extremely high first day returns reached during "Dot-com bubble" by internet IPOs and all IPOs in general; Ritter and Welch (2002) examined the increase in the percentage of tech and internet IPOs over time, while Loughran and Ritter (2004) demonstrated that the increase in the average level of underpricing is also related to the increase in the portion of IPOs conducted by young tech and internet companies. Finally, Lowry and Schwert (2002) and several other authors showed that, on average, technology and internet IPOs are more underpriced than non-technology and non-internet IPOs.

The aim of this thesis is not to compare the performance of IPOs in different economic sectors and observe how internet-related IPOs perform with respect to other IPOs. The research objective is, instead, to study only IPOs in the internet sector and find out which are the most important internet firms' characteristics and factors which influence their IPO initial returns. I focused my research on US internet IPOs conducted in the period from 2000 to 2013 and listed on NASDAQ and on NYSE; I used several variables (which include IPO first-day return, age of issuing companies, firms' market capitalization, ratio of shares offered in the IPO,

underwriter reputation and period of the IPO) to describe the principal characteristics of IPOs in the sample and to highlight the potential relationships between the level of IPO initial returns and the variables analysed. Then, I decided to examine the Facebook IPO case because, after having analysed almost the whole population of internet-IPOs conducted in the years 2000-2013, Facebook's IPO seemed to be an outlier IPO: it was the largest, most anticipated and hyped internet IPO of that period and, contrary to expectations, was not characterized by high initial return but by poor stock performance for at least the first three months after the listing. I tried to study all the different causes and reasons of Facebook's IPO failure because, only considering the specific problems and the unique characteristics of Facebook's IPO, it is possible to explain its negative stock market debut.

The rest of the thesis is organized as follows. Chapter 1 provides an overview of IPOs, describing the main steps involved in the IPO process, the different pricing mechanisms and the services provided by underwriters; it also summarizes the advantages of going public and all the costs that issuing firms must incur.

Chapter 2 presents the literature review of underpricing phenomenon and reports which are, according to past empirical researches, the variables that affect the level of IPO underpricing. In the last paragraph, it is also briefly described the long-run underperformance of initial public offerings.

Chapter 3 shows the empirical research performed on internet IPOs. After having described the data used, the data sources and the most important variables studied, the chapter presents all the descriptive statistics analysed, the most relevant results obtained in the research in comparison with literature findings and the differences between Facebook's IPO and the other internet IPOs.

Chapter 4 reports the Facebook' IPO case: it is analysed the business and the economic performance of the company before the IPO, it is described the IPO process and the problems arisen the last days before the offering, and it is performed a valuation of the company using DCF methodology. In the final part of the chapter, it is discussed the causes of Facebook's IPO failure and the reasons behind the bad stock performance.

The final chapter, Chapter 5, presents the main results of the thesis and the limitations of the analysis performed.

CHAPTER 1 - HOW TO GO PUBLIC

1.1 - WHAT IS AN IPO?

“Few events in the life of a company are as great in magnitude and consequence as initial public offering (IPO)” (Draho, 2004, p.1). An initial public offering is the first time that stocks issued by a company are sold to public investors. So, companies go public via an IPO and their shares become quoted on a stock exchange. “The initial public offering (IPO) is frequently the largest equity issue a corporation ever makes” (Zingales, 1995, p. 425).

The process of going public is a milestone for private company but it is complex, complicated and time-consuming. It involves different specific steps and requires important decisions to be made. Firms need to accurately take into consideration not only the trade-off between the advantages and disadvantages of going public, but also the implications of this decision and the problems that will arise. The decision to go public, in fact, generates substantial changes in the everyday life of a company: there is a change in the firm’s ownership structure, a loss of management control, an increase in information disclosure requirements and an increase in regulatory oversight. Other important issues that need to be analysed before starting the IPO process are: the check of substantial, formal and listing requirements, the choice of the stock market, the path leading to the listing and the relationship with investors. The success of the IPO strictly depends on the decisions taken, on the planning of the whole process and on the management of the relations with the market.

1.2 - WHY DO PRIVATE COMPANY DECIDE TO GO PUBLIC?

Which are the benefits of going public? There is not a unique answer to this question; there are different and various beneficial reasons. Going public allows firms to raise new equity capital necessary to finance the growth of the company. As stated by Dessy and Vender (2001), stock market is one of the most important financing channels for firms: it permits firms to pursue their development plans without creating any further debt. The funds received from the stocks sold in an IPO provide huge amount of liquidity (e.g. in 2014, Alibaba was able to raise \$25bn in its IPO, which is today considered the world’s biggest IPO in history) that can be used to balance the company’s financial structure, to support the rapid expansion of firm’s operations, to enhance research and development activities or to finance the acquisition of other companies for external growth purpose. Public companies have also easier access to debt markets thanks to the transparency of their financial and economic situation with respect to private firms.

Another important motivation to go public is the fact that the stock exchange listing permits firm's founders and pre-IPO investors to monetize part of their investments in open-market transactions or to totally liquidate their position using the listing as an exit strategy. Zingales (1995, p.425) affirmed that "the IPO is also an important channel through which an entrepreneur or venture capitalist gets rewarded for his initial effort".

Going public guarantees significant intangible benefits: public companies obtain an increased visibility with respect to private companies through their ongoing information disclosures to the stock market. In addition, as sustained by Geddes (2003), listed companies can attract and recruit more qualified manager and higher quality employees thanks to the visibility and prestige that often characterize this kind of companies. There are also marketing and commercial advantages: a firm become better known during the IPO process and, generally, a listed firm is considered stronger and more stable. The better reputation, that companies can gain for being listed, can facilitate and encourage relationships with suppliers and customers.

Public firms have the possibility to use their stocks as a payment method in the acquisition of other business reducing, in this way, cash needs of the acquiring firms. Taulli (2000) said that using stocks as consideration is a common practice for mergers and acquisitions. Moreover, listed companies have the possibility to compensate and motivate their manager using stock options.

Another benefit of being a listed company can be linked to the existence of the daily market valuation determined by investors and expressed by means of stock prices. Stock prices daily change to reflect and value management choices and company's results; Dessy and Vender (2001) affirmed that this kind of valuation can be considered a good benchmark for the firm's real value (at least in the medium-term).

1.3 - THE IPO PROCESS

Going public is a complex and time-consuming process. Draho (2004, p.182) showed that "internal preparations for the IPO can begin up to two years prior to the offer date". A company must choose the stock exchange for the listing of its shares, select the underwriter (the investment bank) and the auditor, decide the type of the offering: preparation activities and these decisions are fundamental to the success of the IPO. Once the process is started, a company must work closely with the investment bank, produce the information required by regulatory authorities, run the marketing phase, undertake road shows, manage the relationship

with the market. The various steps involved in an IPO are described and analysed in the following paragraphs.

The Choice of the Stock Market

Before issuing shares to the public, a company must choose which stock exchange to list its shares on. Firms going public often choose their domestic stock exchange but, in recent years, as described by Jenkinson and Ljungqvist (2001), with the increasing irrelevance of national boundaries, thanks to the spread of electronic trading, and the increasing competition between stock exchanges, companies have become more and more free to choose where to have their shares listed.

In the US, the major markets are: the New York Stock Exchange (NYSE), the NASDAQ Stock Market and the American Stock Exchange (AMEX). The London Stock Exchange comprehends: the Official List (the main market), the Alternative Investment Market (AIM, the market for small and growing companies) and techMARK (the market designed for high-technology firms). In Italy, stock market is divided between: the main list on Mercato Telematico Azionario (MTA), the STAR segment (“Segmento per Titoli ad Alti Requisiti”) and the segment for small, innovative and high growth firms (“Nuovo Mercato”).

Each market has different and specific listing requirements. For example, the NYSE has more stringent requirements and standards with respect to the NASDAQ (in terms of offering size, firm’s total assets, revenue and profitability); while in UK, companies listed in the AIM segment or techMARK are subject to less regulation than the ones listed on the Official List. Firms going public must respect and satisfy the listing requirements and the regulations imposed by the market in which they seek the admission. After verifying the compliance with the requirements, companies must submit an application to the stock exchange. Generally, as described in detail by Bagley and Dauchy (2012), the application is made the same day or shortly thereafter the registration statement¹ is filed.

The choice of the stock market not only depends on the specific financial requirements and on the minimum listing standards imposed by the regulatory body of each stock exchange. Indeed, it is also important to consider the costs associated with the listing and, above all, the effects that the different market can have on the image and visibility of the firm. The market’s reputation can have a relevant influence on the final choice. The most prestigious market is the

¹ The “registration statement” is discussed in the next paragraphs (See “*The Drafting of the Prospectus*”).

New York Stock Exchange: the listing on NYSE can guarantee the firm immediate visibility between investors. Nevertheless, Taulli (2000) argued that the NASDAQ is today the market preferred by the most important high-tech companies in the world.

The Selection of the Underwriter

“The investment bank is a vital cog in a successful IPO. [...] Consequently, the issuer/underwriter relationship is of paramount importance and must be structured wisely.” (Draho, 2004, p.187). Generally, the management of a private company has never started an IPO process before and so lacks detailed knowledge of the stock market. Investment banks can then offer the possibility to exploit their experience in the stock exchange listing, their network of knowledge between investors (above all institutional investors), their reputation on the market and their competencies, in order to increase the firm’s visibility and help in making the necessary changes that a company going public must fulfil.

Initial public offerings are managed and controlled by investment banks that provide different services: first of all, banks have to perform a “due diligence” investigation in which they analyse the financial situations of the company and verify that capital requirements are satisfied, then they have to collaborate with the company to prepare and draw up the prospectus, in addition they have to underwrite the stock offering assuming part of the risk associated with the issue proceeds and, finally, they have to sell the shares to the public and allocate them to investors. Investment banks play also a relevant role in determining the pricing of the shares and the timing of the listing, and in supporting the marketing phase of the IPO.

Before analysing the services provided by the investment bank, it is helpful to examine how the process of selecting an underwriter is articulated. In the underwriting market for IPOs there are several investment banks that are ranked using total IPO proceeds and market share. The most important are Goldman Sachs, Morgan Stanley, Citigroup, UBS, Merrill Lynch.² Firms start the selection with a “beauty contest” (or “bake-off”) in which each participating bank makes a formal presentation to the board of directors. According to Bagley and Dauchy (2012), banks in their presentation emphasize their expertise in the IPO process and their reputation, and show their recent relevant IPOs, the post-IPO price performance of the companies they have taken public and their preliminary views on the market value of the company. After the “beauty contest”, the firm chooses the investment bank that will be the lead manager of the IPO process (a company can also select two or more banks that will act as co-lead managers). To evaluate

² Source: Dealogic.

the potential lead managers, a company can use different combined criteria: cost minimization (the choice of underwriter influences the IPO costs, in particular underpricing and compensation costs), bank's reputation and, moreover, the reputation of bank's analysts who will follow the listing, information specialization (the quality of information that the bank has collected about the firm and potential investors) and monitoring services (the level of external underwriter monitoring).

The "Underwriting Agreement" is a formal contract that acts as a purchasing contract between the issuer and the underwriter. There are three principal forms of the contract: "firm commitment", "best efforts" and "all-or-none". In the firm commitment contract, the underwriter guarantees to purchase all the shares issued and to absorb the eventual loss generated by unsold shares; in the best effort contract, instead, the underwriter makes an effort to sell firm's stocks but does not guarantee the proceeds and unsold shares return to the issuer. In an all-or-none underwriting, if the entire issue is not sold, then the issue is cancelled, and investors' money collected will be returned.

Another aspect to take into consideration in the relationship between the issuer and the underwriter is the underwriter compensation. The primary form of compensation is represented by the spread: the difference, expressed as a percentage, between net price (the price at which the underwriter buys shares from the issuer) and offer price (the price at which the underwriter sells the shares to the public); in other words, it is the percentage of the offer price retained by the investment bank. The spread comprehends management fee, underwriting fee and selling concession. In recent years, a 7 percent spread is the most common spread charged by underwriters (for very large IPOs, lower spreads are charged). Chen and Ritter (2000), in their paper entitled "The Seven Percent Solution", showed that, in the period between 1995 and 1998, more than 90 percent of US IPOs raising between \$20 million and \$80 million had spreads of exactly 7 percent. High spreads represent a relevant cost for a firm going public but the convergence to a common spread eliminates, totally or in part, compensation cost as an underwriter selection criterion. In some cases, especially in best efforts agreement, investment banks receive an additional compensation in the form of warrants. A warrant grants the underwriter the right to buy firm's shares at a fixed price (exercise price) that is lower than the offer price.

The Due Diligence Process

At the beginning of the issuer-underwriter relationship, there is an initial information-gathering phase. The bank chosen as the lead manager performs the due diligence investigation which includes: financial, business, legal and accounting due diligence. In this phase, the underwriter works closely with the firm; generally, due diligence consists of company inspections and meetings, interviews, question-and-answer sessions with senior and operational managers of the firm. Due diligence is needed to ensure that all necessary and relevant information about the company is accurate and complete. As stated by Espinasse (2014), an appropriate due diligence investigation is fundamental for any due diligence defence against prospectus liability.

In the business due diligence, the underwriter examines the company’s activities and business operations; in the financial due diligence, instead, it analyses firm’s capital structure, business plan and financial forecasts. In addition, in the legal and accounting due diligence, the underwriter inspects contracts (for example, contracts with main customers and suppliers), legal documents and accounts ledgers. Finally, the underwriter also verifies managers’ qualifications and experience to run the firm.

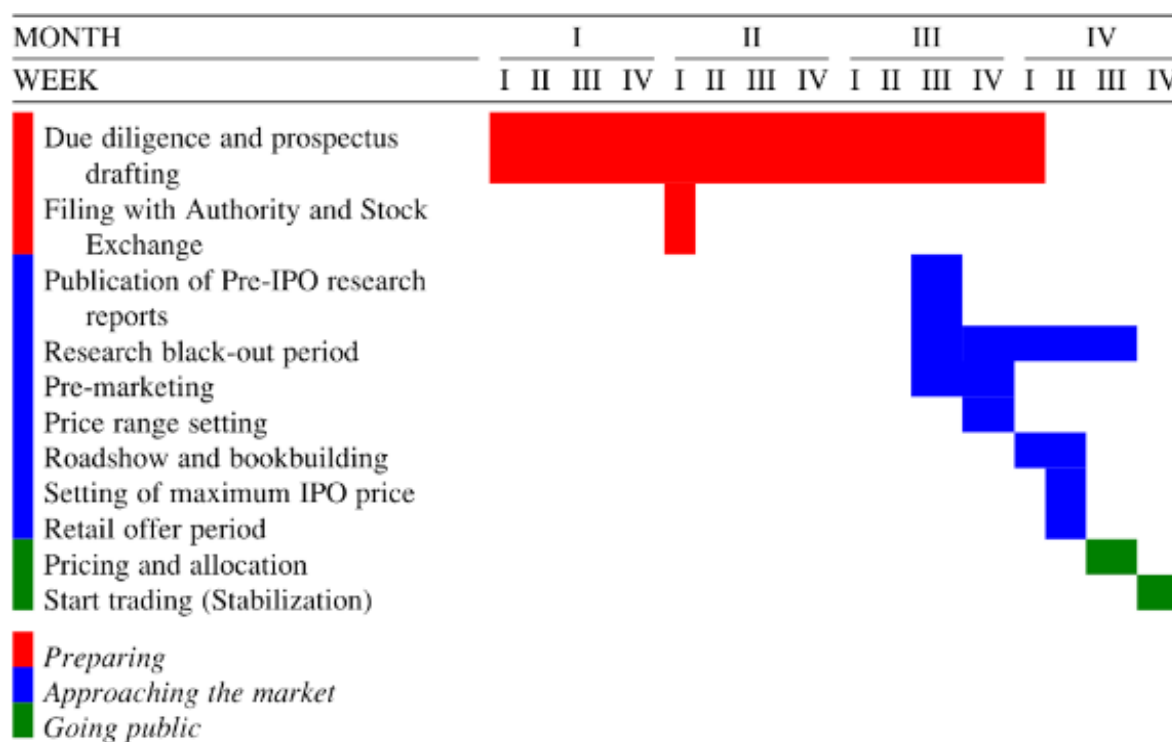


Figure 1 - Key steps of the IPO process. Source: IANNOTTA, G., 2010. *Investment banking. A guide to Underwriting and Advisory Services* (p.53). Heidelberg [u.a]: Springer.

The Drafting of the Prospectus

As it is possible to observe in Figure 1, the preparation of the prospectus is performed in parallel to the due diligence investigation. All the information gathered in the due diligence phase is used to draft an initial (or preliminary) prospectus that, in the US, is also known as “red herring” prospectus because it has a legal disclaimer printed in red in the front page. In fact, the information contained in this preliminary document are usually not complete and subject to change.

“The prospectus is, legally, the only publication that investors should use in order to make an investment decision to buy shares [...] in an IPO” (Espinasse, 2014, p.102) and, so, the initial prospectus is the primary source of information accessible to all investors. It contains information regarding the issuer, the firm’s business and strategy, the company’s competitive advantage and potential risk factors, the quality of the management, the use of proceeds and, also, information about principal shareholders and the investment bank chosen as underwriter. The prospectus “is a key marketing and protection tool for retail investors” (Iannotta, 2010, p.53). The “offering circular” is, instead, used to indicate a different version of the prospectus that contains all the information necessary for institutional investors.

The final prospectus includes also detailed information about the issue, with the specification of the final price and the number of shares offered. The document must be approved by the market authority (e.g., in the US, by the SEC, “Securities and Exchange Commission”); the investment bank and the issuer are liable for its content.

In the US, the final prospectus is the most important document in the registration statement, which is filed with the SEC for the registration of initial public offerings. The registration statement must conform to SEC rules which specifies both the amount and the format of information required. Companies, in general, submit the registration statement on Form S-1 which is composed by: (a) the prospectus³; (b) all supplemental information (e.g., the company’s charter and bylaw, the underwriting agreement...). Form S-1 requires several documents and detailed data; for this reason, small issuers can use Form SB-1 and Form SB-2 (that require less specific information and a less complex procedure than Form S-1) to register their offerings. Once received the registration statement, the SEC’s Division of Corporate Finance must verify its accuracy and conformance to disclosure requirements and it can always refuse to render the registration statement effective if information is incomplete or some documents are missing. After the approval of the prospectus and all the other documents, the

³ In Italy, it is called “Prospetto Informativo” and it must be filed with the CONSOB.

registration statement becomes effective and the final prospectus becomes available to investors. A company is not allowed to sell its shares until the registration filed with the SEC is effective.

Marketing Phase

The IPO marketing phase starts with important pre-marketing activities, which are also known as pre-deal investor education (PDIE). The investment bank's analysts prepare a Pre-IPO Research Report about the company, which is used to educate institutional investors on the firm's investment case. The Research Report contains the analysts' valuation and company's financial projections. Pre-deal investor education is important because it permits to collect investors' feedbacks and their interest in participating in the IPO, so as to help the underwriter in determining a price range for the issue.

In the last couple of weeks (in general 2 or 3 weeks) prior to the listing, companies undertake the "roadshow". Roadshows are a series of short meetings in which the management of the issuing company and the investment bank present the issue to potential investors (both retail and institutional investors). Meetings can take place in different financial centre (including the city in which the stocks will be listed); they can include presentations to a large audience and "one-on-one session" with the most important investors. Roadshows presentations do not add new information about the firm and "merely reiterate fairly general information already contained in the prospectus. Perhaps surprisingly, road shows may instead be a way for the investment banker to gather information from investors, about their views of the company and its valuation. [...] The marketing phase thus generates a lot of additional information regarding the reaction of the potential investors to the offer, which can be fed into the next stage of the process when the final price is set" (Jenkinson and Ljungqvist, 2001, pp.14-15). These meetings are, indeed, "a key tool in testing the market appetite for the IPO" (Yates and Hinchliffe, 2010, p.383): in this phase, investors are solicited to make non-binding bids⁴ and it is created a book of orders useful to determine the final price of the issue (the Book-building process⁵).

In addition to the roadshow, there are also other forms of marketing for an IPO, like press briefings and advertising. Marketing campaign is critical and, as stated by Kuhn (1990, p.269),

⁴ "In some cases the bids received during the marketing stage are legally binding (for example those from retail investors), but in the case of institutional investors the bids are more normally not. However, in practice, even though such institutional bids may not be legally binding, there is a strong presumption that investors should be prepared to honour their bids". (Jenkinson and Ljungqvist, 2001, p.14)

⁵ See next paragraph "*IPO Pricing (Book-Building Mechanism, Fixed-price Offerings and Auctions)*"

it “will determine the success or failure of the IPO. The key is to stimulate investor demand for the stock so that, as in basic economics, the demand will exceed the supply.”

According to Cook, Kieschnick and Van Ness (2006), who analysed a sample of US IPOs from 1993 to 2000, marketing is also critical for the aftermarket performance of the IPO; in their paper entitled “On the marketing of IPOs” (2006, p.59), they reported that there is “a positive and significant correlation between retail trading activity during the first day of trading in an IPO and the IPO’s pre-issue publicity, [...], pre-issue publicity is positively correlated with upward revisions in IPO offer prices and offer price valuations that are above comparable firms in their industry, [...], insider wealth exceed their dilution losses when more pre-issue publicity is associated with their IPO, [...], initial IPO returns are positively correlated with pre-issue publicity, and [...], investment banker compensation is positively and significantly correlated with pre-issue publicity.”

IPO Pricing (Book-Building Mechanism, Fixed-price Offerings and Auctions)

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

According to Sindelar, Ritter and Ibbotson (1994), the pricing of IPOs is a difficult process because it is not possible to observe market price prior to the offering and also because issuing firms are, generally, young companies with little operating history. The offer price must reflect the fundamental value of the company and must be aligned with the valuation of comparable firms (“peer comparison”). At the same time, it must also take into consideration issuer’s and underwriter’s interests, investors’ feedbacks and financial market conjuncture. Sindelar, Ritter and Ibbotson (1994, p.66) stated that “if the price is set too low, the issuer does not get the full advantage of its ability to raise capital. If it is priced too high, then the investor would get an inferior return and consequently might reject the offering”.

There are three different IPO pricing mechanisms: book-building, fixed-price offering and auction. Nowadays, the most popular mechanism worldwide is book-building. The use of book-building has been growing rapidly over the last two decades and its growing popularity has come, above all, at the expense of auctions. Draho (2004, p.219) asserted that “issuers, underwriters and institutional investors appear to universally favour book-building when given

the choice”, but he added that “by and large, issuers do not get to choose their IPO mechanism. Either regulatory constraints limit the choice or market forces dictate that certain types of issuers must use a particular method”.

In fixed-price mechanism, the issue’s final price is already specified in the preliminary prospectus and is chosen prior to collecting orders from investors; so, it is not influenced by market’s demand and cannot be adjusted in response to excess supply or demand. Normally, fixed-price offerings are used when the underwriting agreement is a best-effort contract; the underwriter does not actively sell the shares but it only distributes the prospectus, collects orders and performs share allocation⁶ with limited discretion.

The book-building mechanism is, instead, typical of firm commitment contract and it is characterized by more discretion permitted to the underwriter and to the issuer in pricing and allocating the shares. It can be divided in three main steps. In the first one, the underwriter, after having distributed the preliminary prospectus which contains a preliminary share price range, determines which investors are invited to participate in the book-building process. In general, investment banks consider only institutional investors in this process and exclude retail ones⁷. Retail investors are not invited, as discussed by Jenkinson and Ljungqvist (2001, p.17) given “the infeasibility of inviting and discussing the issue with a large number of small investors”, and because they “may typically be less informed as to the value of the company than professional investors”. In the second step, investors communicate their interest and submit their bids. Bids can be strike bid (in which the investor accepts to buy a given number of share at whatever price is set within the preliminary range) or limit bids (in which the investor divides its bid in different price-quantity combination and communicates a price above which he does not consider the purchase). This step is usually performed during the road show and it is a dynamic process, “with the investors and investment bank both getting a feel for the state of demand and with investors revising their bids as the process evolves” (Jenkinson and Ljungqvist, 2001, p.17). Indeed, if during the book-building process it results that the demand is very strong (or very weak), underwriters can revise the range of the offer price and investors can submit new bids. In the final step, the investment bank determines the final price and allocates shares. 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 setting the price and allocating the shares.

⁶ See next paragraph “Allocation of the Shares”

⁷ “The book-building method is often criticized because, in contrast to the other methods, underwriters generally exclude investors from the bidding process”. (Sherman and Titman, 2002, p.1)

The last alternative mechanism that underwriter and issuing firm have, to price the issue, is auction; even if, in practice, they can also use hybrid offerings mechanisms which combine book-building and fixed price or book-building and auction. “Auctions afford the issuer and underwriter the least amount of control in determining the IPO outcome” (Draho, 2004, p.218). Investors specify the limit price of their offer and the number of shares they are willing to buy. The aggregate demand curve is formed by all the individual orders and the final price is determined by the matching of demand and fixed supply. All investors who bid a price above the offer price receive firm’s shares. There are two main auction models: single-price auctions (in which all investors pay the same price) and discriminatory-price auctions (in which investors pay what they bid). Unlike book-building, auction can “be conducted as entirely disintermediated processes” (Jenkinson and Ljungqvist, 2001, p.19).

Allocation of the Shares

Ljungqvist and Wilhelm (2002) showed that IPO allocation policies generally favour institutional investors. In their paper entitled “IPO allocations: discriminatory or discretionary?”, after having analysed 1.032 IPOs between 1990 and 2000 across 37 different countries, they concluded that share allocated to institutional investors are almost double than those received by retail ones. They demonstrated that this happens both in US, where underwriters have full discretion in most IPOs, and outside US, where investment banks’ allocation discretion is more constrained.

In general, there is no pricing and allocation discretion provided by auction mechanism. Once decided the model of the auction, the underwriter has a passive role. “The bids are effectively anonymous, as shares are allocated in a non-discriminatory basis to institutional and retail investors” (Draho, 2004, p.218).

In fixed-price offerings, several allocation mechanisms reflecting the market’s regulations are used in different countries. The most common is “fair allocation system”, in which share allocation is performed pro rata when the issue is oversubscribed. Many countries allow some kind of discrimination based on order size or in favour of particular types of investor, but, generally, “fixed-price offerings provide underwriters with no discretion because shares are simply allocated on a pro rata basis” (Ljungqvist and Wilhelm, 2002, p.16).

As described by Jenkinson and Ljungqvist (2001, pp.18-19), “the sorts of non-discriminatory rules that often apply to fixed price offerings do not apply to book-building efforts: the investment bank, in consultation with the issuing company, will have complete discretion over

who is allocated shares. This discretion over allocation is one of the controversial aspects of book-building, in part 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 book-building process and, as stated by Iannotta (2010), the empirical evidence confirms the fact that more informed investors receive larger allocations. Investment bank’s discretion induces investors to reveal their information before the final pricing of the IPO and the reward for investors providing information is underpricing. In general, “the institutional allocation increases with the amount of underpricing because the two are jointly determined by the positive information revealed by the institutions” (Draho, 2004, pp.222-223).

Listing and Trading

Once the IPO pricing and allocation have been performed, secondary market trading starts shortly after (usually after a couple of days). Generally, the first days are characterized by volatility and a trading volume extraordinary high as some investors continue to buy shares and others flip⁸ their allocations to obtain a short-term profit. The underwriter plays an important role in stabilizing the price of the shares. Price stabilization activity is aimed at absorbing the excess supply of shares and avoid excessive price fall in order to protect investors against downside risk in the first trading period. The investment bank starts “to buy shares in the after-market in the event of pressure for the share price to fall (in particular below the issue price) and to sell more shares (either at the time of the IPO or in the after-market) in the event of high levels of excess demand for the shares” (Jenkinson and Ljungqvist, 2001, p.21). Stabilization activities last usually for two weeks after the first day of listing and the possibility to perform price stabilization must be disclosed in the IPO final prospectus.

The underwriter can also provide analyst coverage of the company after its IPO and help to develop an effective communication program, with which it is possible to ensure a steady flow of information to new investors. All the services provided by the underwriter are essential to ensure the company’s smooth transition from private to public ownership.

⁸ “Investors who receive an IPO allocation are said to flip their shares if they sell them immediately in the aftermarket. Flipping could be motivated by the desire to lock in quick profits or to dump shares before price stabilization ends”. (Draho, 2004, p.263)

1.4 - THE COST OF AN IPO

Undertaking an IPO is a time-consuming and costly process. Companies must consider not only the costs associated with the IPO process (the costs of listing) but also the ongoing costs of being a public company (the costs of maintaining a public company structure). According to Dessy and Vender (2001), rather than costs, it would be more appropriate to talk about “investments” needed to go public, as the decision of becoming a public company brings several benefits that help the firm to create value in the long-term.

All the key decisions made by the issuer during the IPO process affect the direct and indirect costs of going public. The most important decisions influencing the price are: the choice of the underwriter, the proportion of equity sold to new investors, the amount of money to raise, the price of the issue, the pricing and allocation mechanism. In addition, as shown by Menyah and Paudyal (2002), the costs depend also, on firm characteristics and market conditions: firm size (market capitalisation), pre-IPO ownership of the company, the book to market ratio and the market volatility at the time of the IPO.

The most relevant cost of the IPO is the underwriter’s compensation: the gross spread that is expressed as a percentage of total IPO proceeds. In US, medium-size IPOs tend to have a gross spread equal to 7% while, in Europe, this percentage is generally lower. Gross spread comprehends management fee, selling fee and underwriting fee, which are negotiated between the issuer and the investment bank and, generally, revealed in the prospectus.

Marketing campaign and road show expenses, legal and accounting fees, printing expenses for the prospectus and registration (or listing) fees are the main fixed costs. According to Heim (2002, p.28), “attorneys’ fees, accounting fees and other expenses can easily add up to \$400,000 to \$500,000 for a typical IPO”. Moreover, it must be also considered the opportunity cost of management time: the time that senior managers spend working with investment bank’s analysts in preparing the prospectus and other documents for the IPO. “Each hour that the management and employees of a company spend in providing information to the lawyers and investment bankers is an hour that is lost in running the operations of the company” (Heim, 2002, p.29).

The pricing mechanism influences also the cost of an IPO. In general, pricing the IPO using book-building process is more costly than using fixed-price or auction mechanism. After having studied a sample of 2,143 IPOs by issuers from 65 countries during the period from 1992 to 1999, Ljungqvist, Jenkinson and Wilhelm (2003, p.2), found that “the direct costs of bookbuilding are, in our sample, around twice as high as in fixed-price offerings”.

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

Finally, also the underpricing is generally considered an indirect cost of an IPO. It is defined as the percentage difference between the offer price and the first day closing price. It is an opportunity cost since issuers, selling shares at a price below their potential market value, are “leaving money on the table”.⁹

⁹ *Underpricing Phenomenon is discussed and analysed in Chapter 2 - “IPO UNDERPRICING”*

CHAPTER 2 - IPO UNDERPRICING

2.1 - UNDERPRICING PHENOMENON

The existence of the underpricing phenomenon has been well-documented by literature. Several researches and studies examining the underpricing of initial public offerings have been carried out since the early '70s. As reported by Pazarzi (2014, p.281), “for the 40-year period between 1969 and 2010 there have been conducted more than 150 empirical studies regarding the underpricing of the IPOs”. Reilly (1973) and Ibbotson (1975) were among the first to analyse this phenomenon; since then, different theories and models have been built to explain the reasons and factors that cause and influence IPO underpricing.

Ritter and Welch (2002), studying a sample of 6,249 US IPOs from 1980 to 2001, found that the average first-day return was 18.8%; while Smith (1986), after having summarized the results and studies of other authors, concluded that the average underpricing exceeded 15%. However, the level of underpricing is cyclical; Loughran and Ritter (2004, p.5) described that: “in the 1980s, the average first-day return on initial public offerings (IPOs) was 7%. The average first-day return doubled to almost 15% during 1990-1998, before jumping to 65% during the internet bubble years of 1999-2000 and then reverting to 12% during 2001-2003”. The degree of underpricing varies also from country to country; Jenkinson and Ljungqvist (2001, p.37) stated that: “the first-day premium that investors experience is positive in virtually every country, and typically averages more than 15 per cent in industrialized countries and around 60 per cent in emerging markets, measured between subscription and the first day of trading”.

Underpricing can be calculated using the “Raw Initial Return (RIR)” formula, which simply is the percentage difference between the first day closing price ($P_{i,1}$) and the IPO offer price ($P_{i,0}$):

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

Otherwise, it can be calculated using the “Market Adjusted Initial Return (MAIR)” 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, while $MI_{i,0}$ is the market index at the end of the shares subscription period. It is more accurate to use the “Market

Adjusted Initial Return” formula, since the first day closing price may be high with respect to the offer price only because the whole stock market has risen after the closing date of the subscription.

Underpricing is an opportunity cost for a firm going public; Loughran and Ritter (2002, p.413) showed that “during 1990-1998, companies going public in the United States left more than \$27 billion on the table, where the money left on the table is defined as the first-day price gain multiplied by the number of shares sold. [...] The \$27 billion left on the table is twice as large as the \$13 billion in investment banker fees paid by the issuing companies”. In a perfect capital market, underpricing should not be so high and firms should not “leave money on the table” or, at least, not a large amount.

Underpricing is an ongoing phenomenon that has been documented and studied almost in all countries, which are characterized by different company population and, above all, by different institutional, legal, and regulatory frameworks. Several authors have offered various theoretical explanations to explain IPO underpricing in any country and in any different framework. This chapter deals with presenting and analysing the most relevant models and theories of the existing literature about IPO underpricing.

2.2 - REASONS AND THEORIES FOR IPO UNDERPRICING

Underpricing has been discussed in several scientific papers and different models have been developed to understand the causes and reasons of this phenomenon. It is not possible to identify a single theory able to provide an exhaustive explanation of IPO underpricing. However, the most important theoretical studies are based and focused on asymmetric information; there are models based on information revelation, on firm’s quality signalling and on the information asymmetry existing between various classes of investors or between the issuer and the underwriter. Other possible explanations are discussed in ownership and control theories, in lawsuit avoidance theory and, more recently, also in behavioural theories.

In addition to the theories trying to explain the reasons of IPO underpricing, there are also empirical researches that examine the factors influencing the level of underpricing, like the reputation of the underwriter, the market timing of the initial public offering, the pricing mechanism adopted, firm and economy specific factors.

Information Asymmetry

Among the different asymmetric information theories, the best-known model is represented by Rock's (1986) winner's curse. This model is based on the assumption that it is possible to categorize investors into "informed" and "uninformed" investors. In addition, it assumes that the investment bank and the issuing firm are not completely informed about the "true value" of the shares: the investment banker and the firm are in informational disadvantage because they must reveal to the market all the information included in the prospectus, but, they are not able to obtain all the information possessed by informed investors (usually institutional investors). According to Rock (1986, p.190), "even though the firm and its agent know more than any single individual in the market, they know less than all the individuals in the market combined. While the investment banker is the one agent suited to price the offering, his information and expertise are inferior to the pooled talents and knowledge of all the agents. Some individuals may have inside information about a competitor that could have a significant impact upon the firm's product. Others may know better than the firm or the investment banker the appropriate rate to discount the firm's cash flows in the capital market". Informed investors, taking advantage of their additional information, apply only for underpriced shares, while uninformed investors are not able to discriminate between underpriced and overpriced shares. Uninformed investors face a winner's curse: they get only a small fraction of underpriced issues due to the high demand from informed investors, while they get full allocation of overpriced offerings because there is no competing demand. Consequently, knowing the winner's curse phenomenon, the uninformed investors abstain from participating in the IPO, unless the investment bank and the issuing firm price the share at a discount. If informed demand is not sufficient to absorb all the shares offered, the participation of uninformed investors becomes essential to the success of the IPO. According to Rock, underpricing is therefore needed to attract uninformed investors because it ensures them, at least, a non-negative return.

Rock's model is intuitive and can be considered an application of Akerlof's (1970) theory, "The market for Lemons", in which uninformed buyers are in informational disadvantage and cannot distinguish between good quality and bad quality products: asymmetric information causes adverse selection and lead to market failure. One implication of "winner's course model" is that the degree of underpricing should be linked with ex-ante uncertainty about the value of the firm. Ex-ante uncertainty reduces the investor's ability to correctly evaluate a firm going public, and so, as reported by Gregoriou (2006, p.195), "the greater the ex-ante uncertainty, the greater is the advantage of becoming an informed investor". Beatty and Ritter (1986) concluded that

underpricing increases with ex-ante uncertainty, since an increase in the number of informed investors intensifies the winner's curse phenomenon.¹⁰

Rock's model assumptions and findings have been largely discussed in the literature. Jenkinson and Ljungqvist (2001) questioned the assumption that issuing firms must pay with the underpricing of the shares offered for the uninformed investors' participation in the offering. Indeed, if the number of informed investors is not sufficient to absorb all the offering, the uninformed ones could invest through institutional-informed investors (for example using investment funds) in order to exploit their superior information (in exchange for a fee) and not subscribe overpriced shares.

Hanley and Wilhelm (1995), instead, studying a sample of 38 IPOs managed by a single underwriter, found that approximately 70% of shares of underpriced issues are allocated to institutional investors but also that "institutional investors take similar large position in overpriced offering" and that "institutional investors are allocated large proportion of issues for which pre-offer interest is weak and also of issues for which it is strong" (Hanley and Wilhelm, 1995, p.240). These findings can be interpreted as evidence against Rock's model, according to which informed investors impose a winner's curse on uninformed ones by bidding only for underpriced offerings.

In addition, Rock's model assumes that it is costless for informed and institutional investors to abstain from participating in overpriced issues. Nevertheless, Benveniste and Spindt (1989) showed that this choice can cost an investor the opportunity to take part in future (underpriced) offerings and, consequently, also informed investors decide to participate in less attractive issues. Finally, it is important to take into consideration that Rock's model can be used to explain underpricing only in fixed-price offering, where price is not determined by the bidding of investors. Indeed, winner's curse phenomenon is not a problem in book-building mechanism, because the investment banks solicit investors feedbacks and information prior to the final pricing.

Information asymmetry can be also observed between the issuing firm and the investment bank. Baron's (1982) model takes into consideration this information asymmetry and assumes that investment banks have superior information about the demand level for the shares offered and capital markets. According to Baron, issuing firms rationally allow underwriters to underprice in order to compensate them for the use of their superior information. In fact, when the underwriter is better informed than the issuer, the pricing and distribution decisions are

¹⁰ See the paragraph "*The Relation Between Ex-Ante Uncertainty and Underpricing*"

delegated to the investment bank. “The value to the issuer of the banker's distribution effort is an increasing function of the issuer's uncertainty, so greater uncertainty increases the demand for the advising and distribution services of the banker” (Baron, 1982, p.956). Investment banks choose the IPO price so as to optimize their unobservable distribution efforts and, so, they have an incentive to underprice. The greater the level of ex-ante uncertainty and the greater the asymmetry of information between issuer and underwriter, the greater the level of underpricing.

However, Muscarella and Vetsuypens (1989), testing the Baron’s model, found that the information asymmetry existing between the issuer and the underwriter is not useful to explain the underpricing phenomenon. They used a small sample of 38 IPOs of investment banks going public without referring to other intermediaries. In other words, they selected a sample of “self-marketed” or “self-underwritten” IPOs, in which investment banks participated in the distributions of their own shares. By doing so, there is no separation between the issuer and the underwriter and, therefore, there is no information asymmetry and there are no principal-agent problems. Muscarella and Vetsuypens showed that, in contrast to Baron’s findings, “self-marketed” IPOs present statistically significant underpricing and, above all, that these IPOs are no less underpriced compared to traditional IPOs.

Information asymmetry can be identified not only between investors or between issuers and underwriters, but also between underwriters and investors. This type of asymmetric information is described and used by “Information Revelation Theories”¹¹ (or “Market Feedback Hypothesis”) to analyse the IPO underpricing phenomenon. Lastly, information asymmetry between issuers and investors is utilized by “Signaling Theory”¹², in which the issuers are better informed about company’s present value and future cash flows and employ underpricing as a signal of the firm’s quality.

Information Revelation Theories (Market Feedback Hypothesis)

According to Information Revelation Theories, institutional investors have better knowledge than the issuer and the investment bank about the firm’s competitors, the industry and the economy as a whole. Investors are not incentivized to reveal positive information about their own demand for the shares, because this would lead to an increase in the final offer price (in informationally efficient market, prices reveal all available information), that is

¹¹ See next paragraph, “Information Revelation Theories”

¹² See the paragraph “Signaling Theory”

disadvantageous for them. Since the disclosure of information is essential to avoid mispricing, underwriters must find a way to induce investors to truthfully reveal their private information.

Benveniste and Spindt (1989) were the first to introduce “information gathering theory” and they pointed out that book-building could be an appropriate mechanism to induce investors to reveal information about the demand for shares in the pre-selling phase. As described in Chapter 1¹³, investors communicate their interest and submit bids (communicating the price and the number of shares they are willing to buy) during the road show, before the final price has been set. Book-building process permits the underwriter to reduce the incentive to mispresent positive information and to better evaluate the offerings. However, investors that truthfully reveal their private (positive) information and their expectations about the value of the listing company must be rewarded by underwriters with discretionary allocation of underpriced shares (book-building mechanism allows investment banks to have total discretion in allocating shares). “If the underwriter is doing his job well, each investor’s reward will just reflect the marginal value of her private information. It follows that underpricing increases in the marginal value of private information” (Jenkinson and Ljungqvist, 2001, p.91). Book-building permits to reduce uncertainty and information asymmetries. Issuers benefit from setting a final offering price higher than underwriter’s initial estimate (upward revision of the initial price range) and, deliberately, “leave some money on the table” because, in the absence of underpricing, investors would not have interest in revealing their positive information.

Cornelli and Goldreich (1999) findings support “information gathering theory”. They investigated 39 international equity issues conducted using book-building procedure and they found that underwriters allocate large fractions of shares to investors that reveal information in their bids. Specifically, Cornelli and Goldreich (1999, p.3) found that “bidders who reveal information through limit prices¹⁴ are awarded more shares than similar bidders who submit quantity bids without price limits. Similarly, bidders who revise their bids - which can be interpreted as providing information as it arises over time - are subject to more favourable treatment in the allocation of shares”, and that “bidders from the issuer’s country receive a favourable allocation, especially in issues with low oversubscription. Since local investors are typically viewed as better informed, this favourable treatment may be again seen as a remuneration for the revelation of information”.

¹³ See *IPO Pricing (Book-Building Mechanism, Fixed-price Offerings and Auctions)*

¹⁴ “The presence of limit prices provides additional information, which tells the investment banker how demand varies within the preannounced price range.” (Cornelli and Goldreich, 1999, p.2)

Another support to Benveniste and Spindt theory is provided by Hanley (1993). She showed that the new positive information collected during book-building process is only partially incorporated in the final offer price. Hanley (1993, p.249) demonstrated also that “underpricing is positively related to revisions in the offer price from the filing of the preliminary prospectus to the offer date. [...] Issues that have positive revisions in the offer price and good information revealed are significantly more underpriced than other IPOs”.

A contribution to Information Revelation Theories is supplied also by Benveniste and Wilhelm (1990). They stated that the optimal mechanism to acquire information from informed investors is price discrimination and that underwriters need to use a combination of price and allocation discrimination to maximize proceeds. If investment banks could offer underprice shares only to well-informed investors, their incentive to truthfully reveal positive information would be stronger and issuers would leave less money on the table. As reported by Bennouri and Falconieri (2001, p.3), “the authors [Benveniste and Wilhelm] show that, the less discretion the intermediary has, the smaller the issuing firm’s profit is. They conclude that, the seller is better off when he can use both instruments, price and quantity discrimination. This however is not what we observe in practice”. Indeed, regulatory constraints generally forbid price discrimination among investors and, consequently, investment banks must underprice the issue to all IPO subscribers, without rewarding only informed ones.

In addition, Benveniste and Wilhelm also studied the interaction between Rock’s winner’s curse and information revelation. They demonstrated that, when underwriters are able to extract information from well-informed investors using book-building mechanism, both the information asymmetries among investors and between investors and underwriters are reduced. Consequently, it is reduced the winner’s curse problem for uninformed subscribers and then the level of underpricing.

In contrast with Information Revelation Theories and with Cornelli and Goldreich findings, Jenkinson and Jones (2004), after having analysed 27 European IPOs managed by different underwriters, concluded that there is no evidence that well-informed investors receive larger allocation. They found that underwriters discriminate only between long-term and short-term investors and that long-term shareholders are constantly preferred in allocation. Their “results cast doubt upon the extent of information production during the bookbuilding period” (Jenkinson and Jones, 2004, p.2309).

Signaling Theory

Unlike Information Revelation Theories and Rock's assumptions, Signaling Theory supposes that companies (especially issuing companies' managers) are the well-informed party and have better information about the firm's value and future prospects than investors. Underpricing is seen as a signal of firm's quality and it is used by high quality firms to convince potential subscribers of their true value.

The first to introduce the concept of "Market Signaling" was Spence (1973), who described and analysed the role of signalling in the job market. He assumed that there are different quality workers and that employers cannot verify workers' quality before the hiring. According to Spence, "high-quality" prospective workers use education level as a signal of their high productivity.

The original intuition to IPO signalling theory came from Ibbotson (1975), who stated that issuers deliberately underprice to "leave a good taste in investors' mouths so that future underwritings from the same issuers could be sold at attractive prices" (Ibbotson, 1975, p.264). Other applications of signalling models to explain IPO underpricing were provided by Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989).

Allen and Faulhaber (1989) built a model in which there are only two types of firms: good and bad. The quality of the firm is defined in terms of expected dividend streams¹⁵. Only firms know the type to which they belong, and issuers are risk-neutral: they want to maximize expected proceeds that are the sum of issuing proceeds from initial public offerings and subsequent seasoned offerings. Good firms signal their quality through the initial offering price: the level of underpricing is positively linked with the quality of the firm. Allen and Faulhaber (1989, p.304) affirmed that "underpricing the firm's initial offerings (which is an immediate loss to the initial owners) is a credible signal that the firm is good to investors, because only good firms can be expected to recoup this loss after their performance is realized. [...] The owners of bad firms know their expected performance and subsequent market valuation. They know they cannot recoup the initial loss from underpricing, and so cannot afford to signal".

Grinblatt and Hwang model (1989) is similar to the one proposed by Allen and Faulhaber. Company's managers are well-informed about firm's future cash flow, while investors have little knowledge about project cash flow and their variance. Issuing firms use two different signals: the degree of underpricing and fractional holding (companies use a combination of retained shares and IPO underpricing). They showed that the decision to retain part of the shares

¹⁵ "Good firms have higher expected dividend streams than bad firms" (Allen and Faulhaber, 1989, p.307)

issued, is a signal of managers' optimism about firm' future prospects. They observed positive relationship between the retention rate and initial returns, and also between the level of underpricing and the value of the firm.

Finally, Welch (1989) built a model in which he assumed that firms are rational actors with superior information operating in a perfectly competitive capital market. The main assumption is that low quality firms must incur high imitation cost to appear to be high quality firms. However, investors may be able to find out the firm's true quality after the IPO and before seasoned offerings; the cost of underpricing can induce low quality firms to voluntarily reveal their quality. Welch demonstrated that the cost of signaling is lower for high quality firms and that the degree of underpricing is positively correlated with the firm quality. "The model strongly suggests that IPO firms pursue a multiple issue strategy when they choose both the price and the proportion of the firm they offer at their IPO. The reason why IPO underpricing results in a higher SO [seasoned offering] price is an information asymmetry between firm owners and investors. High-quality firm owners can signal their superior information to investors because their marginal cost of underpricing is lower than the marginal cost of underpricing for low-quality firm owners" (Welch, 1989, p.445).

Ownership Dispersion Hypothesis

A different category of models explaining underpricing is focused on the changes of the ownership structure and, above all, on the ownership dispersion caused by an IPO process. Indeed, the going public process engenders the separation of ownership and control. Before the IPO, ownership is generally concentrated with few owners or entrepreneurs, monitoring is not a problem for investors and there is no a liquid market for shares. Listing provides liquidity to pre-IPO shareholders and produces dispersed ownership. The greater dispersion of shareholders has direct and important effects on management's incentive and control, and causes agency problems between managing shareholders and dispersed investors.

Zingales (1995) and Booth and Chua (1996) were the first to deeply investigate the connection between the going public decision, the ownership's structure changes and IPO underpricing. Zingales said that issuing companies use initial public offering to optimize their ownership structure and that "the decision of a firm to go public is the result of a value-maximizing decision made by an initial owner who wants to eventually sell his company" (Zingales, 1995, p.426) He showed that a more diffuse ownership allows controlling shareholder to obtain a higher price when selling its controlling stake. So, owners create diffuse ownership using an

IPO and maintain a controlling block of shares to extract more surplus from a future potential buyer.

Booth and Chua (1996) built a model in which they demonstrated that the issuer's demand for broad ownership dispersion creates an incentive to underprice shares. Underpricing and oversubscription help initial ownership dispersion, and this results in a more liquid secondary market. Booth and Chua (1996, p.307) showed that "secondary market liquidity increases with the level of oversubscription and ownership dispersion, which in turn increases total information costs and underpricing". The explanation provided by the model is not mutually exclusive of other explanations of IPO underpricing (e.g. Rock's winner's curse, Signaling Theory, Information Revelation Theory). The empirical results show that underpricing is a positive function of ownership dispersion.

The most known model about ownership dispersion is the one developed by Brennan and Franks (1997). They studied a sample of 69 IPOs issued in the UK between 1986 and 1989 and they showed that underpricing is used by issuing company's managers to retain control. According to Brennan and Franks, underpricing typically produces oversubscription and it is followed by rationing in the share allocation. Owners have the possibility to perform strategic share allocation; indeed, when owners wish to maintain the control of the firm after the IPO, they deliberately underprice the issue and ensure oversubscription: this reduces the possibility of a hostile takeover because it permits the owners to discriminate between the potential subscribers. Shares are then rationed to investors in order to reduce the block size of new shareholders: "the discrimination is usually against large applicants and in favour of smaller applicants" (Brennan and Franks, 1997, p.412). The greater dispersion also permits the incumbent managers to avoid constant monitoring by a new large shareholder. Some authors argued that new shareholders can always buy shares in the secondary market, obtain a large block of shares and so start a hostile takeover. However, when a large investor is expected to put together a large stake and to change the ownership structure of the firm, the share price increases and, as stated by Shleifer and Vishny (1986, p.464), "if ownership structure is initially very diffuse and trading is public, it is not profitable to assemble a large block of shares". The results of the model confirmed "that the size of the underpricing is negatively related to the size of large blocks assembled after the IPO, which is consistent with underpricing being an effective mechanism to secure a diffuse outside shareholding" (Brennan and Franks, 1997, p.412).

In contrast with Brennan and Franks, Stoughton and Zechner (1998) developed a model in which rationing in the share allocation is used to favour large rather than small investors, in

order to enhance monitoring on management and reduce agency problems. They argued that ownership structure can affect the efficiency of corporate governance and consequently firm value. Different investors have different capabilities to monitor managerial actions: large shareholders are better suited and equipped to perform monitoring activities. Investment banks and issuer should so offer favoured treatment to large investors. If price discrimination is not feasible, issuing firms can favour some investors through allocation of large fraction of underpriced shares: in fact, Stoughton and Zechner (1998, p.47) sustained that “rationing provides a mechanism whereby different classes of investors may be treated differentially, although they all purchases securities at a common price”. Their model generated several empirical predictions: the most important is that rationing in favour of large investors should be positively linked with underpricing. Nevertheless, results and international evidence are not conclusive about the accuracy of these predictions.

Lawsuit Avoidance Theory

A completely different explanation of underpricing phenomenon is discussed in Lawsuit Avoidance theories. The idea behind these theories was first introduced by Logue (1973) and Ibbotson (1975) and it is quite simple: underpricing is used as a mean of insurance against future litigation and possible lawsuits from shareholders. Lawsuits can be time-consuming and very costly to issuing firms, not only directly (costs linked with legal fees or the opportunity costs of management time) but also in terms of reputation costs. Firms going public and their managers have an incentive to insure against these costs: underpricing is deliberately used to reduce the probability of being sued for misstatements or omissions in the prospectus and for bad stock price performance.

The principal support to Lawsuit Avoidance Theory was provided by Tinic (1988) and by Hughes and Takhor (1992). Tinic suggested that IPO underpricing serves as insurance against legal liability and reputation damage. He analysed two samples of IPOs: the first included IPOs performed from 1923 to 1930 (before the Security Act of 1933), while the second sample included IPOs from 1966 to 1971 (after the Security Act of 1933). The Security Act of 1933 was the first relevant legislation regarding the offer and sale of securities and increased firms' disclosure and liability requirements: this also increased the risk of future litigation with shareholder. According to Tinic, the higher is the risk of future litigation, the higher should be the underpricing applied by the issuing firm. The empirical results reported in his work confirmed its hypothesis: the underpricing was significantly lower for IPOs performed before

1933, when the lawsuit avoidance was not a real problem, and increased after the Security Act became effective.

Hughes and Takhor (1992, pp.709-710) developed a richer model to analyse if “the risk of future litigation can induce an underwriter to purposely sell an initial public offering (IPO) at a discount relative to the value assessed by the underwriter”. They pointed out that there are several circumstances in which litigation risks induce firms and investment banks to underprice. Nevertheless, they concluded that, even if a link between litigation risk and underpricing exists and can be found in most IPOs, the litigation risk is not the only cause of underpricing phenomenon and they observed that “underpricing occurs even in countries where litigation risk is not a factor” (Hughes and Takhor, 1992, p.737).

Lowry and Shu (2002) contributed to this theory. They started from the fact that litigation is costly and that firms wish to reduce litigation risks and insure against such costs. They noted that firms can lower the probability of being sued by conducting an accurate due diligence prior to the IPO and by decreasing the potential damages for IPO investors using underpricing. In their paper, they wanted to simultaneously analyse: “whether litigation risk affects IPO issuers’ incentives to underprice their issues [the insurance effect] and whether underpricing lowers the expected litigation costs by reducing lawsuit probabilities [the deterrence effect]” (Lowry and Shu, 2002, p.311). In their investigation, Lowry and Shu found evidence and support for both the insurance and the deterrence effects linked with litigation risks. In particular, they demonstrated that “firms with higher litigation risk underprice their IPOs by significantly greater amount” and that “firms that engage in more underpricing significantly lower their litigation risks” (Lowry and Shu, 2002, p.333).

Behavioural Theories

Other models that are still at a development and testing stage can be categorised as Behavioural Theories: these theories assert that the underpricing is the result of investors’ behavioural biases. The most relevant support to this hypothesis came from Welch (1992) and Ritter (1998).

Welch (1992) proposed an explanation of IPO underpricing based on information “cascade” effect. He showed that investors rely completely on the information inferred from previous sales and on the purchasing decision of other investors and thus create information “cascade” by following sequential sales: they tend to ignore their own private information and act like the previous investors. “As a consequence, if a few early investors believe that the offering is overpriced, they can swamp the information held by all other investors and doom the offering

to fail. Or, if a few early investors believe that the offering is a bargain, they can create almost unlimited demand for this issue” (Welch, 1992, p.696). Book-building discourage this kind of behaviour¹⁶ and Information Cascade Theory can be, in general, applied in fixed-price offerings. Late investors observe whether early investors purchased or abstained from participating in the offerings, so issuing firms need to underprice in order to create high demand from early investors and to start a positive cascade. Indeed, Welch demonstrated that overpriced offerings are not successful but only underpriced ones succeed: this is the reason why issuing firms apply high level of underpricing when pricing their IPOs.

In agreement with Welch, Ritter (1998) argued that the IPO market can be characterized by bandwagon effects. These effects develop when investors take into consideration not only their own information but also the decisions of other investors: an investor is not willing to buy stocks from an IPO, if other investors are not buying. So, investor’s decisions are strongly influenced by other investors’ actions and late investors generally follow the choices of early ones. To take advantage of this effect, “an issuer may want to underprice an issue to induce the first few potential investors to buy, and induce a bandwagon, or cascade, in which all subsequent investors want to buy irrespective of their own information” (Ritter, 1998, p.9).

2.3 - FACTORS THAT AFFECT THE LEVEL OF UNDERPRICING

As it is possible to note from previous paragraphs, there is no a unique and universal explanation of IPO underpricing, but there are several theories and models developed to explain this phenomenon. A relevant challenge for authors and researchers is represented by the fact that it is not easy to test the assumptions behind models and analyse the empirical results obtained. In addition to the theories regarding the reasons why companies leave money on the table, there are also other studies regarding the main factors and variables that affect the level of initial underpricing. Among these studies, there are some which focus on the relation between underpricing and ex-ante uncertainty.

The Relation between Ex-Ante Uncertainty and Underpricing

According to Beatty and Ritter (1986), the greater the ex-ante uncertainty about an offering’s value, the greater the expected underpricing. They defined ex-ante uncertainty as the

¹⁶ “In book-building, cascades do not develop because the underwriter can maintain secrecy over the development of demand in the book.” (Jenkinson and Ljungqvist, 2001, p.95)

uncertainty about the intrinsic value per share when a company becomes listed and they used two proxies for it: the inverse of the gross proceeds raised in an offering and the log of one plus the number of uses of proceeds listed in the prospectus. Other similar studies, investigating the relation between ex-ante uncertainty and underpricing, used different uncertainty proxies that can be grouped into five categories: company characteristics, offering characteristics, prospectus disclosure, certification and after-market variables. Beatty and Ritter (1986, p.227) demonstrated that “there is a positive relation between the ex-ante uncertainty about an initial public offering’s value and its expected initial return”.

Ritter (1991) confirmed that the smaller is the offering, the higher is the initial return and showed also that there is a negative relation between firm’s age (at the time of going public) and the level of underpricing. The younger is the firm, the higher is the expected underpricing, “consistent with the notions that risky issues require higher average initial return and that age is a proxy for this risk” (Ritter, 1991, p.20). Indeed, newly created firms generally exhibit higher ex-ante uncertainty than old and well-established firms.

Hanley (1993) provided another proxy for the ex-ante uncertainty surrounding an issue. He stated that the ex-ante risk of an issue can be measured using both the percent width of the offer price range and the expected size of the offering. Wider price range are set when the investment banks are unsure about the valuation and the price of an issue: “the wider the offer range, therefore, the greater the uncertainty about the true value of the issue” (Hanley, 1993, p.239). Instead, James and Wier (1990) found that the existence of a borrowing relationship reduces the ex-ante uncertainty about the value of the issuing firm’s equity in the secondary market. According to them, the presence of established credit relationships reduces the uncertainty and, consequently, the degree of IPO underpricing. Their empirical results provided evidence that IPOs of firms with previously established borrowing relationships and with borrowing histories are underpriced substantially less than other initial public offerings.

The Relation between the Reputation of the Underwriter and Underpricing

Another important factor that influence the level of IPO underpricing is the reputation of the underwriter. Generally, due to information asymmetry problems, issuers need to underprice the issues to stimulate investors’ demand and attract IPO subscribers. Nevertheless, some authors stated that the degree of information asymmetry can be reduced by employing highly reputable and prestigious underwriters: high quality investment banks are assumed to accurately present information in the prospectus and so reduce the extent of information asymmetry. Empirical

evidence showed that IPOs conducted by more reputable underwriters are linked to lower initial returns, that means lower underpricing.

Logue (1973), after having examined a sample of 250 IPOs, found significant differences in the average initial return between the IPOs performed by prestigious and non-prestigious investment banks. According to Logue, the reputation of the underwriter represents a signal used by potential investors to evaluate the risk associated with the IPO and the quality of the issuing firm. Consistent with this hypothesis, Carter and Manaster (1990) demonstrated that underwriter reputation is inversely related to short-run underpricing and that more prestigious and reputable underwriters are linked to less risky initial public offerings.

Underwriters and auditors with high reputation certify the quality of the issuing firms and the fairness of the offer price and, consequently, encourage uninformed investors to participate in the IPO. Titman and Trueman (1986) showed that issuers that have favourable information about firm's value tend to select prestigious underwriters and auditors: "when a firm sells shares for the first time its true value is imperfectly known by investors and the quality of the auditor and investment banker chosen by the firm's owner provides information to the market about that value" (Titman and Trueman, 1986, p.159).

Firms' owners wish to reduce and minimize underpricing since it represents an important cost for issuing firm; so, firms wish to select reputable underwriters that have access to better information, provide better estimates of the issue and set a higher final offering price. However, high quality auditors and prestigious investment banks charge higher fees and only managers that have favourable information about the issuing firm's value have an incentive to engage reputable underwriters. Beatty (1989) found that also high-quality auditors are associated with less underpriced IPOs and confirmed that the lower underpricing is compensated by higher fees: "value-maximising owners of IPO firms will choose the auditing firm with reputation capital that equates the marginal benefit of less underpricing with the marginal cost of a higher quality audit" (Beatty, 1989, p.696).

Several papers and studies have described and tested the relation between underwriter reputation and underpricing. Different authors have used several different proxies and measures of underwriter reputation, but all concluded that underpricing is negatively related to the quality of investment banks. It is important to underline that most studies have been conducted in US market and it is not appropriate to extend these findings to other markets, without taking into consideration the different characteristics of these markets. In emerging markets, the information asymmetry is more severe, the informational efficiency is lower, it is more

expensive for investors to collect information and it might be more difficult for investors to assess underwriters' and auditors' reputation as compared with developed markets. So, "even though prior research documents the significant negative impact of underwriter reputation on IPO performance in the US market, it may not be plausible to expect such a relationship to exist for IPOs in an emerging market" (Guner, Onder and Danisoglu, 2004, p.4).

2.4 - MARKET TIMING OF IPO AND THE IMPACT ON THE LEVEL OF UNDERPRICING

Important determinants of IPO underpricing are also market cycles: cycles exist in both the volume and the average initial return of initial public offerings. As it is possible to observe from Figure 2, the number of IPOs are not randomly distributed over time but there are clear signs of positive autocorrelation: high-volume periods are almost always followed by further high-volume periods.

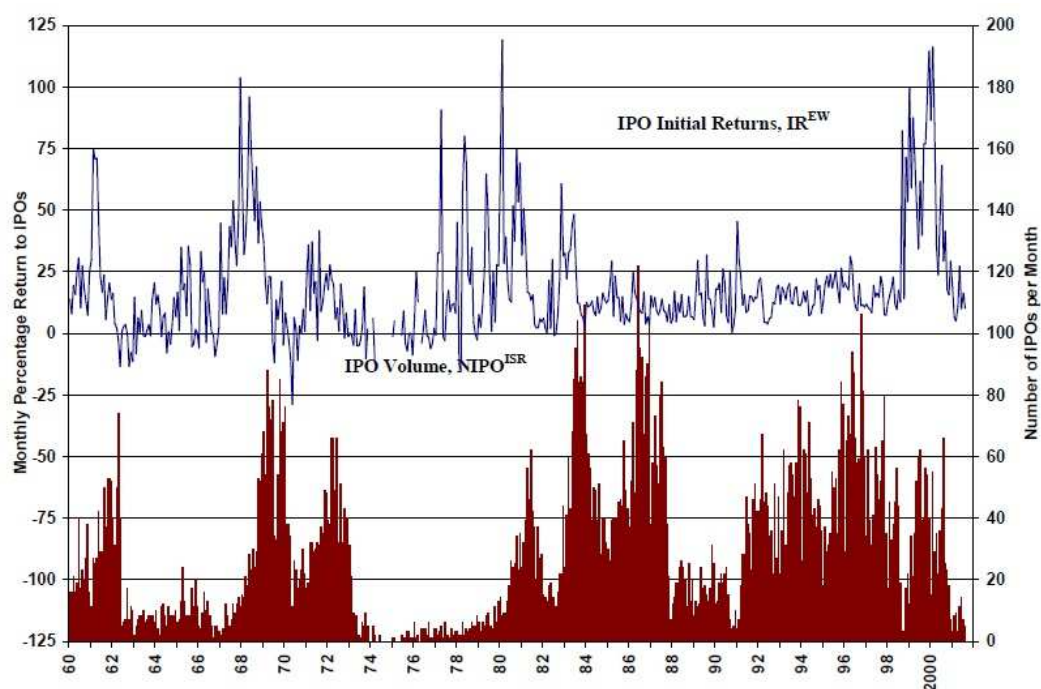


Figure 2 - Ibbotson, Sindelar and Ritter's (1994) data on number of US IPOs per month and average initial return by month. Updated on Jay Ritter's website to cover the period January 1960 - August 2001. Source: Lowry, M. and Schwert, G.W., 2002 (p.1174).

As shown by Sindelar, Ritter and Ibbotson (1994), the same phenomenon happens for average initial returns: like IPO volume, also the degree of underpricing is cyclical and periods of high initial returns generally last for several months. Periods characterised by high average initial returns and an unusually high volume of offerings are known as "hot issue" market (from Figure 2, it is possible to note the "hot issue" market of the late 1990s in US). "Cold" IPO markets,

instead, are characterised by low degree of underpricing, low issuing volume and few instances of oversubscription.

It is not easy to find a rational explanation for the existence of “hot issue” market. Ritter (1984) introduced the “changing risk composition” hypothesis, which explained that riskier IPOs tend to be underpriced more than less risky IPOs and so, if there are periods in which firms going public are riskier than in other periods, the period with riskier firms will be characterised by higher underpricing. Another possible explanation is linked to the fact that underpricing is positively autocorrelated and that investors can predict future initial returns with considerable accuracy: if investors chase trend and follow “positive feedback” strategies, “they may end up causing the expected positive autocorrelation of initial returns in a kind of self-fulfilling prophecy” (Sindelar, Ritter and Ibbotson, 1994, p.72). Moreover, Ritter (1991) argued that the market goes through temporary “windows of opportunity”: periods in which IPOs can be sold at relatively high valuation multiple due to the over-optimistic investor behaviour. Issuers try to successfully time their IPOs to take advantage of these “windows of opportunity” and exploit favourable market sentiment.

It is difficult to find out a connection between IPOs timing and investor sentiment because “sentiment is an intangible attitude that defies easy quantification” (Draho, 2004, p.14). However, it can be investigated whether there exists a link between IPOs timing and industry valuations surrounding the IPO date. Lerner (1994, p.294), studying a sample of 350 biotechnology IPOs from 1979 to 1992, showed that “venture capitalists successfully time IPOs by being more likely to take companies public when their valuations are at their absolute and short-run peaks” and concluded that “IPOs are far more likely to occur when the equity values are high” (p.300). Furthermore, Rajan and Servaes (1997) demonstrated that there is a positive relation between the number of IPOs from an industry in a given quarter and long-term growth projections for recent IPOs in the same industry. They added that “growth projections are overly optimistic. Hence, these results suggest that firms take advantage of this optimism by raising funds from the public” (Rajan and Servaes, 1997, p.509).

In conclusion, the flow of IPOs is not constant. Firms need to consider the trade-off between costs and benefits of going public that vary over time; indeed, not only stock market valuations and market sentiments vary, but also listing requirements, stock exchange regulations, commissions paid to intermediaries and other factors can change and influence the IPO timing decision. Normally, firms have the option to go public at any time and finding the right IPO timing is a crucial decision. Private firms wait for “windows of opportunity” and period of high investor sentiment to maximize IPO proceeds. Issuing firms conduct their IPO during periods

of high stock market valuations also because “for a given funding need a higher offer price implies less dilution” (Jenkinson and Ljungqvist, 2001, p.47). Rarely private firms go public after a market downturn but delay their IPO process until favourable market conditions are re-established.

2.5 - UNDERPRICING IN DIFFERENT COUNTRIES AND IN DIFFERENT ECONOMIC SECTORS

The presence of underpricing phenomenon in the IPO market has been frequently studied and largely confirmed. Although most studies have analysed US stock market and have focused on US IPOs, empirical studies provide evidence about the presence of underpricing also in every other studied market. Figure 3 reports the level of IPO underpricing by country of listing: it is possible to note that there are important differences in the average initial underpricing across countries.

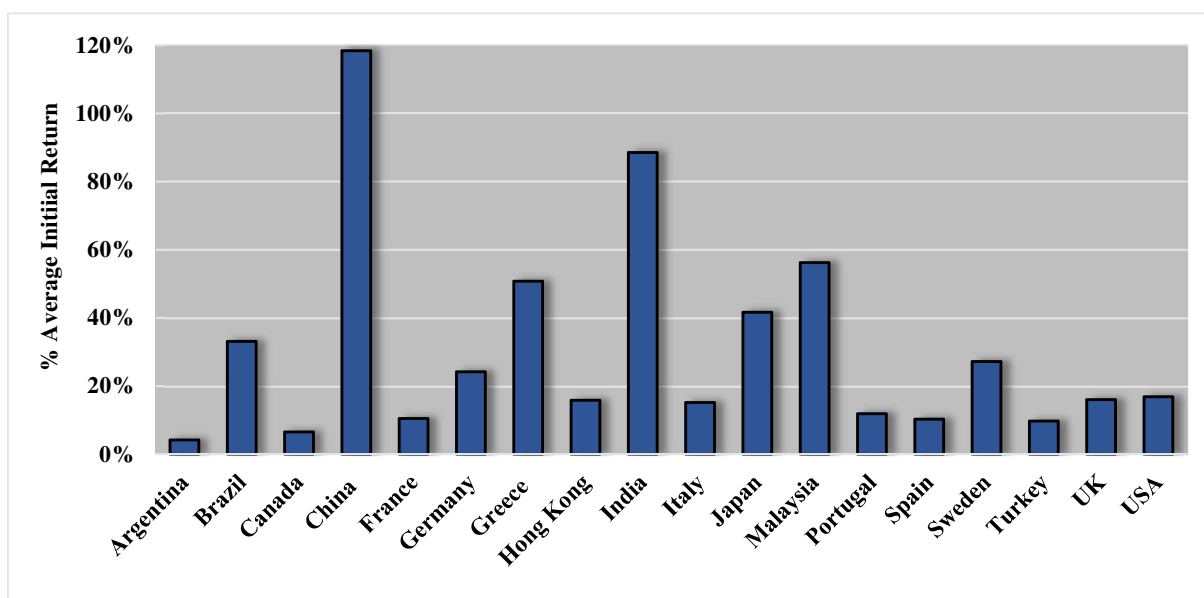


Figure 3 - Average Return by Country. Source: own illustration based on data from Loughran, Ritter et al. (1994)

The level of underpricing varies from country to country: it is higher in Asian market than in more developed countries. China, India and Malaysia have the highest average underpricing (almost 120% in China in the period 1990-2013). In US average underpricing is about 17% (registered in the period 1960-2014), while it is lower in Canada (6.5% in the period 1971-2013) and in Argentina (only 4% in the period 1991-2013). In European countries, the average underpricing is very high in Greece (approximately 50% in the period 1976-2013) and Sweden (more than 27% in the period 1980-2011), while it is more limited in Italy (15% in the period

1985-2013), France (10.5% in the period 1983-2010) and Spain (10% in the period 1986-2013).¹⁷

These relevant cross-country differences are, above all, related to institutional differences that arise from binding regulations, contractual mechanisms and to the characteristics of firms going public. Nguema and Sentis (2006) showed also that the differences in the level of underpricing could be explained by the country risk, that is a non-financial risk. They demonstrated that “countries exhibiting the strongest country risk have their financial markets more subject to IPO underpricing” (Nguema and Sentis, 2006, p.3).

Other studies investigated whether underpricing varies in different economic sectors. Economic sectors can be classified into the following categories: industry, bank and insurance, new technologies, and other services. “Industrial firms and banks and insurance companies have equivalent initial returns, the latter being less underpriced than other services. Among all categories, new technology companies are the most underpriced” (Gajewski and Gresse, 2006, p.39). Lowry and Schewert (2002) showed that high-tech companies (biotech, computer equipment, electronics, communications, & general technology) are more underpriced than low-tech companies and also that non-technology firms have the lowest level of underpricing. In addition, Loughran and Ritter (2004), after having studied a sample of 6,391 IPOs conducted in the period from 1980 to 2003, confirmed that tech and internet related companies are characterized by higher initial returns than non-technology firms. They showed that during the “Dot-com Bubble” (1999-2000), the average level of underpricing for technological companies was much higher than for other firms (more than 80% and approximately 23% respectively), but also in the two decades before and in the years after the bubble, the initial returns for tech and internet related firms were higher than for other companies. Finally, Gregoriou (2006, p.227) stated that “IPOs of the new economy [Media, Pharma and Healthcare, Software, Technology and Telecommunication] account not only for the most excessive underpricing, but also for the highest negative first-day return”. These findings can be explained by considering that high tech industry is still relatively young and that technological companies entail higher risks. Indeed, these firms are difficult to be evaluated due to their large proportion of intangible assets and to their uncertain growth prospects: all this increases information asymmetries between firms’ owners and potential investors. The risky nature of high-tech companies is also linked to the fact that they are exposed to technology innovation and their product cycles are

¹⁷ Source of data: Loughran, Ritter and Rydqvist, 1994.

usually of short duration. Consequently, issuers in high-tech companies strongly underprice their IPOs to overcome information asymmetries and signal the true value of the firm.

2.6 - THE LONG-RUN PERFORMANCE OF INITIAL PUBLIC OFFERINGS

In addition to the short-run underpricing and to the “hot issue” market phenomena, a third anomaly (or stylized fact) in the IPO market documented by literature is the long-run underperformance. Ritter (1991) was the first to provide evidence of this phenomenon. He analysed 1,526 US IPOs in the 1975-1984 period and found that “in the 3 years after going public these firms significantly underperformed a set of comparable firms matched by size and industry” (Ritter, 1991, p.3). Subsequent researches and studies investigated different samples and other markets and confirmed Ritter’s findings.

Loughran and Ritter (1995) enlarged the sample used and the period considered by Ritter in his initial study. They showed that companies issuing stocks significantly underperform, if compared to non-issuing firms, for 5 years after the offering date. “The average annual return during the five years after issuing is only 5 percent for firms conducting IPOs, and only 7 percent for firms conducting SEOs. Investing an equal amount at the same time in a non-issuing firm with approximately the same market capitalization, and holding it for an identical period, would have produced an average compound return of 12 percent per year for IPOs and 15 percent for SEOs” (Loughran and Ritter, 1995, p.46). Particularly, they found out that the underperformance is not present in the first six months after the offering date but it is substantial in the next 18 months, while in the sixth and seventh year it is only about 1 percent. A similar study was conducted by Levis (1993) in UK market. He showed that firms going public between 1980 and 1988 in UK significantly underperformed in the 36 months after the day of listing and so that long-run underperformance is not a characteristic only of US IPOs; he added also that IPOs with the highest initial return had a 36-months performance notably worse than IPOs with more limited initial return.

As for the underpricing phenomenon, various reasons and explanations have been given and analysed also for the long-run underperformance. Some authors argued that the phenomenon is linked with the IPO timing decision. If managers successfully time their IPOs to take advantage of “windows of opportunity” and exploit the over-optimistic investor sentiment, they will be able to set a high final offer price. Nevertheless, Helwege and Liang (2004, p.3) found “evidence consistent with the view that excessively positive investor sentiment during hot markets lead to long-term underperformance”. The “window of opportunity” may be

determined also by company's performance and not only by market conditions. Indeed, managers may decide to start the IPO process when the firm is performing well and so take advantage of the firm's high-performance to exploit analysts' higher valuations. Ali (1996, p.1) investigated "whether the market's estimates of future earnings of IPO and SEO firms are optimistically biased during the post-issue period", and demonstrated that analysts tend to be more optimistic in their earnings estimates for issuing firms than for non-issuing firms (in the five years following the offer date). In accordance with Ali, Rajan and Servaes (1997) confirmed that IPOs are conducted when analysts are particularly optimistic about firms' growth prospects and concluded that, in the long run, IPOs with low forecast growth rates have better stock performance and outperform IPOs with high forecast growth rates.

Other authors, instead, stated that young companies, that decide to go public, are usually characterized by high rates of growth: this can explain and justify high valuations made by investors and analysts in the pre-IPO period and in the first months after the offering date. Jain and Kini (1994) found that, after the IPO, operating performance declines over time and subsequently investors' valuations are revised downward, which results in low stock returns in the long-run. Similar findings were also provided by Mikkelson and Shah (1994): they showed that, after the offering date, operating performance worsens, market adjusted stock returns are negative and finally that there is "a positive correlation between the changes in operating performance and the post-offering stock returns" (Mikkelson and Shah, 1994, p.1).

A different explanation for the long-term underperformance is linked with agency costs hypothesis. The great dispersion of shareholders caused by the IPO can create conflicts between managers and new investors. In fact, as existing managers' ownership decreases, also their incentive to maximize firm value rather than private benefits decreases. The higher the proportion of equity sold to new shareholders, the weaker are managerial incentives to maximize firm value and, consequently, the worse is the firm operating performance after the IPO. On the contrary, if managers maintain large equity stakes, the company will have good performance also in the long-term. This hypothesis was tested by Mikkelson, Partch and Shah (1997). They studied the changes in the ownership structure and in the operating performance of the firm. They found out that ownership become considerably less concentrated and, in particular, that there is a long-term decline in ownership of officers and directors. They documented also the deterioration of the operating performance in the first years after the offering date; nevertheless, they concluded that the long-run operating performance is unrelated to the ownership structure and to the post-offer ownership stake of officers and directors.

The theoretical explanations of long-term underperformance provided by different authors remain speculative in nature and find weak support from empirical evidence. Few studies have tried to explain both short-term underpricing and long-run underperformance in a unique model. Although researchers have widely documented the abnormal performance of IPO shares both in the few months after the listing and in the long-term, “economist do not yet know what (if anything) causes initial public offerings to perform poorly in the long run” (Jenkinson and Ljungqvist, 2001, p.58).

CHAPTER 3 – EMPIRICAL RESEARCH ON INTERNET IPOs

3.1 - INTRODUCTION

This chapter is focused on an empirical research performed on internet-related IPOs. The aim of this research is to analyse a sample of US internet-related IPOs in order to describe the level of their initial returns and how it varies over time, and to find out which are the most important internet firms' characteristics influencing the underpricing of their initial public offerings.

The available literature on the internet-related IPOs is mainly focused on the period of the Internet Bubble and on the comparison between internet and non-internet IPOs. Some of the most important authors, like Ljungqvist and Wilhelm (2002) and Loughran and Ritter (2004), tried to explain the reasons and the causes of the extremely high levels of initial returns reached during the "Dot-com bubble" by internet IPOs and all IPOs in general. Ritter and Welch (2002) analysed the increase in the percentage of tech and internet related IPOs (on total IPOs) over time, while Loughran and Ritter (2004) studied the trend of the IPO first-day return and demonstrated that the increase in the average level of underpricing is also related to the increase in the portion of IPOs conducted by young tech and internet-related firms. Ljungqvist and Wilhelm (2002) examined the IPO pricing process during the "Dot-com bubble" and studied the levels of underpricing, analysing both the characteristics of the internet firms that went public in that period and other important elements of the IPOs, like pre-IPO ownership structure and insider selling. Several other authors, for example Lowry and Schwert (2002) and Giudici and Roosenboom (2002), showed that, on average, technology and internet IPOs are more underpriced than non-technology and non-internet IPOs, and described the differences in IPO valuations between non-internet and internet firms.

This research, instead, is focused only on internet-related IPOs; the aim is not to compare the performance of IPOs in different sectors and observe how internet IPOs perform with respect to other IPOs, but to analyse only the IPOs in the internet sector and find out which are the most important internet firms' characteristics and factors which influence their IPO initial returns. Indeed, this research describes and studies internet IPOs, analysing the trend of the average underpricing, the distribution of IPO initial returns, the volume of IPOs in different years, the percentage of underpriced IPOs and the most relevant differences between underpriced and overpriced internet IPOs. I decided to analyse internet IPOs because some of the most important and largest IPOs (both in terms of capital raised and market capitalization of the issuing firms) occurred in recent years are internet-related IPOs; among the most important IPOs of the last

15 years, the following are internet-related IPOs: Google IPO (2004), Facebook IPO (2012), Alibaba IPO (2014), Twitter IPO (2013), Groupon IPO (2011) and Yandex N.V. IPO (2011). Additionally, I decided to focus my research only on IPOs conducted in the years 2000-2013, since the available literature on internet-related IPOs analyses mainly the performance of these IPOs before and during the “Internet bubble”: for example, Loughran and Ritter (2002) investigated the underpricing of internet and non-internet IPOs in the years 1998-2000, Ljungqvist and Wilhelm (2002) studied the characteristics of internet firms among a sample of issuing firms that went public in the period 1996-2000, while Ritter and Welch (2002) analysed the volume and the percentage of tech and internet-related IPOs in the years 1980-2001.

The analysis is based on the period from 2000 to 2013, also because this period was characterized both by the “Dot-com Bubble” and by the financial crisis of 2007-2009, and it is interesting to observe how internet IPOs’ performance and volume varied differently during the bubble and the crisis. The sample includes only NASDAQ and NYSE IPOs, because the NASDAQ stock exchange is the market preferred by the most important high-tech companies and internet firms in the world, while the New York Stock Exchange (NYSE) is the largest stock market in the world (by market capitalization of listed companies)¹⁸ and contains the biggest US blue-chip but also some of the biggest internet firms (for example, Twitter, LinkedIn and Alibaba). The choice of the period (2000-2013) and the selection of the market (NASDAQ and NYSE) were also made in order to put into context the Facebook IPO case that is presented and described in the fourth chapter.

The IPO of Facebook was the biggest internet IPO conducted in the period between 2000 and 2013. Given its dimension, Facebook’s IPO was the most anticipated and hyped internet IPO of that period and, contrary to investors’ expectations, it was not characterized by high initial underpricing but by poor stock performance in the first period after the stock debut. I decided to study the Facebook case (in Chapter 4) because, after having analysed almost the whole population of internet-related IPOs completed in the same years, Facebook’s IPO seems to be an outlier IPO. Comparing Facebook’s IPO to the other internet IPOs, it is possible to note that the performance of Facebook’s IPO is not in line both with the performance of similar IPOs (in terms of firms’ characteristics and period of the offering) and with the performance of the IPOs conducted by Facebook’s competitors. In this chapter, I describe which are the most relevant differences in Facebook’s offering that makes this IPO an outlier IPO; in chapter 4, instead, I will deeply analyse the Facebook case and the reasons behind the failure of its IPO.

¹⁸ Source: “Largest stock exchange operators worldwide as of March 2017, by market capitalization of listed companies”, Statista (2017)

Next paragraphs first present the sample data used in the research, the data sources and the most important variables analysed. Then, it is performed the descriptive analysis of the IPOs in the sample, that highlights which are the principal characteristics of internet-related IPOs and the potential relationships between the level of underpricing and the other variables analysed. The final paragraph reports the most relevant results observed in the research in comparison with literature findings, and the most important differences between Facebook’s IPO and the other internet IPOs.

3.2 - DATA AND DATA SOURCES

I collected a sample composed of 214 US IPOs completed on NASDAQ and on NYSE in the period between May 2000 and December 2013. I selected only internet-related companies that belong to the following industries: computer hardware, communication equipment, electronics, navigation equipment, telephone equipment, communication services, software. I gathered the dataset using different sources, as shown in Table 1.

IPO DATA	DATA SOURCE
- IPO Name - Offer Date - Offer Price - SIC Code	Jay R. Ritter’s Website: “A list of Internet IPOs (1990-2013)”
- First day closing price - IPO Lead Underwrites	IPOScoop’s Website: “Scoop Track Record from 2000 to present”
- Shares Offered - Shares Outstanding	NASDAQ’s Website
- Companies Incorporation Date	Field-Ritter dataset: “Founding dates for 10,266 firms going public in the U.S. during 1975-2015”
- Underwriter Reputation	Jay R. Ritter’s Website: “IPO Underwriter Reputation Rankings (1980-2015)”

Table 1 – IPO Data and Data Sources used in this Research. (Source: own illustration)

The list of internet-related IPOs, together with their offer date, their final offer price and firms’ SIC (“Standard Industrial Classification”) code, has been obtained from Jay R. Ritter’s Website¹⁹; while the data about the first day closing price and the information about lead underwriters have been take from IPOScoop’s website²⁰. The data about shares offered and

¹⁹ “A list of internet IPOs (1990-2013)” available on Jay R. Ritter’s website. See <https://site.warrington.ufl.edu/ritter/ipo-data/> [Accessed 21 September 2017]

²⁰ “Scoop Track Record from 2000 to present” available at: <https://www.iposcoop.com/scoop-track-record-from-2000-to-present/> [Accessed 21 September 2017]

shares outstanding, needed to calculate both firms' market capitalization (at the time of the IPO) and the ratio of shares offered to outstanding, have been collected from NASDAQ's website; instead, the incorporation dates, needed to calculate the age of the companies (at time of the IPO), have been gathered from the Field-Ritter dataset of company founding date²¹. Finally, the information about underwriter reputation has been obtained from "IPO Underwriter Reputation Rankings (1980-2015)" taken from Jay R. Ritter's website²²: this dataset is based on Carter and Manaster rankings, which have been partially modified by Ritter, and contains the rankings for all underwriters in different periods of time²³.

According to Ritter's list of US internet IPOs, there have been 230 internet-related IPOs in the period between May 2000 and December 2013. The sample used in this research is reduced to 214 IPOs, after having excluded 16 IPOs for which the data were not complete or fully reliable; this research is so performed on almost the whole population of internet IPOs listed on NASDAQ and on NYSE in the analysed period.

3.3 - VARIABLES DESCRIPTION

I used several variables to study and describe the internet IPOs in the sample. 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. Therefore, this research uses the Raw Initial Return formula; indeed, as reported by Gajewski and Gresse (2006, p.28), "considering that the market movements are too small to affect the initial returns significantly, most studies measure IPO underpricing with raw returns". The raw initial return has been adopted by different authors: for example, Spindt, Fernando and Krishnamurthy (1999), Loughran and Ritter (2004) and Rajan and Servaes (2003) used the raw initial return formula in their models to study IPO underpricing.

IPOs are underpriced when the initial return assumes a positive value, that is when the first day closing price is higher than the final offer price; while IPOs are overpriced when the initial return is negative. Finally, IPOs are correctly priced when the first day closing price is equal to the offer price.

²¹ "Founding dates for 10,266 firms going public in the U.S. during 1975-2015" available at: <https://site.warrington.ufl.edu/ritter/files/2015/08/Founding-dates-for-10266-firms-going-public-in-the-US-during-1975-2015-2015-07.pdf> [Accessed 21 September 2017]

²² "IPO Underwriter Reputation Rankings (1980-2015)" available at: <https://site.warrington.ufl.edu/ritter/ipo-data/> [Accessed 21 September 2017]

²³ The ranking goes from 0 (lowest quality) to 9 (highest quality). Underwriter rankings are calculated for the following periods: 1992-2000, 2001-2004, 2005-2007, 2008-2009, 2010-2011, 2012-2015.

To describe and analyse IPOs' and firms' characteristics, the following variables are taken into consideration: companies' age, companies' size (market capitalization is the proxy used for the size of the companies), the ratio of shares offered in the IPO, the period in which the IPO is conducted and the reputation of IPO underwriters. The age of the company at the time of the IPO is calculated as the difference (in years) between the date of the IPO and the date of incorporation of the company. The ratio of shares offered is calculated as shares offered in the IPO divided by total shares outstanding; while market capitalization is calculated as the product between the final offer price and the number of shares outstanding at the time of the IPO. Finally, underwriter reputation is measured using the Carter-Manaster rankings in which underwriters are ranked on a 0-9 scale, where the value 9 is assigned to the most prestigious and reputed underwriters. Table 2 summarizes the variables used in this research.

VARIABLE	EXPLANATION
Initial Return (IPO first-day return)	The IPO raw initial return: the % difference between the offer price and the first-day closing price
Age of the Company	The difference (in years) between the IPO date and the incorporation date
Market Capitalization	The product between the final offer price and the number of shares outstanding at the time of the IPO
Ratio of Shares Offered	Shares offered in the IPO divided by total shares outstanding
Underwriter Reputation	It is measured using the Carter-Manaster rankings in which underwriters are ranked on a 0-9 scale
Period of the IPO	The period in which the IPO is conducted: for example, "Dot-com bubble" period (2000-2001) or the years of the financial crisis (2007-2009)

Table 2 – List of Variables used in this research. (Source: own illustration)

3.4 - DESCRIPTIVE ANALYSIS

In the following paragraphs, it is performed the descriptive analysis of IPOs in the sample. The descriptive statistics reported, and the graphs presented, have the purpose of providing a summary of the data that can be useful to highlight the principal characteristics of internet-related 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 Facebook and the other internet IPOs; particularly, the differences in the level of initial return between Facebook's IPO and the other sample IPOs comparable to Facebook's one in terms of companies' size, firms' age (at the IPO) and period of the offerings. Indeed, I will compare the IPO of Facebook first with IPOs conducted by firms with similar

market capitalization, then with IPOs completed in the same period and, finally, with IPOs conducted by firms with similar age.

	Underpriced	Overpriced	Correctly Priced	Total
Number of Companies	167	38	9	214
% of the Total	78%	18%	4%	100%
Mean Initial Return	44.03%	-9.74%	0%	32.63%
Median Initial Return	27.41%	-7.28%	0%	18.42%
Max/Min Value	353.85%	-25.50%	-	-

Table 3 - Descriptive Statistics of the Sample. (Source: own illustration based on sample data)

As it is possible to note from Table 3, the internet-related IPOs included in the sample show an average underpricing of 32.63%. From the total number of companies included in the sample (214), 167 are underpriced (78% of the total IPOs), 38 are overpriced and only 9 are correctly priced. Since this sample includes almost all internet-related IPOs that went public between 2000 and 2013 in US²⁴, it is possible to conclude that nearly 80% of internet related IPOs conducted in this period were underpriced. Considering only pure underpriced IPOs, the average initial return increases to 44.03%; a really high level of underpricing that can be explained by the fact that companies in the sample all belong to tech and internet-related sectors: this result confirms Loughran and Ritter's (2002) findings, who demonstrated that Internet IPOs are generally characterized by severe underpricing. Additionally, Table 3 reports that overpriced IPOs have an average negative initial return of 9.74%, and that the maximum and the minimum value of initial returns are respectively 353.85% and -25.50%. It is possible to note that the median of the initial return is smaller than the mean, meaning that the distribution of initial returns is skewed to the right, toward high values. More in details, to better analyse the distribution, it is useful to calculate its percentiles; Table 4 shows that 50% of total internet-related IPOs (the ones included between the 25th and the 75th percentile) have a positive initial return included between 0.35% and 48.66%. Moreover, as shown by the 5th and by the 95th percentile, 5% of IPOs have a negative initial return lower than -12.89% and another 5% have an underpricing higher than 133.57%. For what regards overpriced IPOs, it is possible to observe that only 5% of IPOs have a negative initial return lower than -22.93%, while 50% of overpriced IPOs have a return included between -13.83% and -3.97%. Finally, considering underpriced IPOs, it is interesting to note that 25% of them (that means 42 IPOs) have an initial return higher than 59.73%. In Figure 4, it is reported the frequency distribution of IPO initial

²⁴ 16 IPOs have been excluded from the total number of US internet related IPOs because data were not complete (see "Data and Data Sources").

returns which, as expected, is skewed to the right; in Appendix A, it is also reported a Box Plot of IPO initial returns for all IPOs in the sample.

Percentiles	Underpriced	Overpriced	Total
5 th	0.43%	-22.93%	-12.89%
25 th	8.85%	-13.83%	0.35%
50 th (Median)	27.41%	-7.28%	18.42%
75 th	59.73%	-3.97%	48.66%
95 th	135.90%	-1.59%	133.57%

Table 4 – Percentiles of IPO Initial Return Distribution. (Source: own illustration based on sample data)

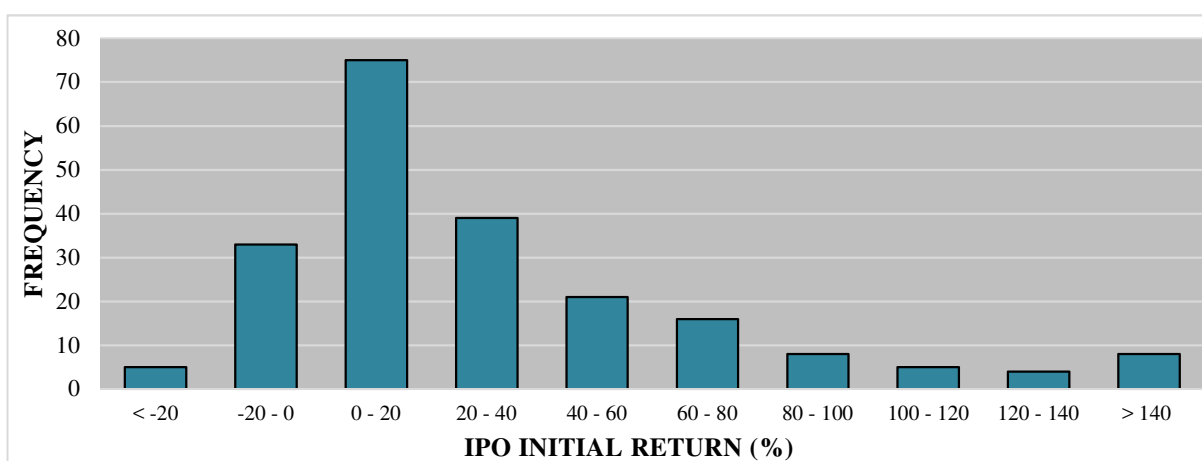


Figure 4 - Frequency Distribution of IPO Initial Return. (Source: own illustration based on sample data)

Table 5 reports some of the most important characteristics of the IPOs. The mean offer price for internet related IPOs in the sample is \$14.59 and the mean market capitalization is almost \$1.8 billion. Even for market capitalization, the median (\$484 million) is substantially lower than the mean, because its distribution (shown in Figure 5) is skewed to the right and the mean is strongly influenced by relatively few extremely high values. Indeed, in the sample, there are some important internet related firms, like Facebook, Google, Twitter, Groupon, Youku.com and Corvis Corp., which, at the time of the IPO, had a market capitalization higher than \$10 billion and which increase the average market capitalization of the sample (these firms are all included in the last range of market capitalization, “>3500”, in Figure 5).

	Underpriced	Overpriced	Correctly Priced	Total
Mean Offer Price	\$15.32	\$12.55	\$9.67	\$14.59
Mean Market Capitalization ²⁵	\$2,067	\$801	\$292	\$1,767
Median Market Capitalizat. ²⁶	\$467	\$504	\$248	\$484
Mean Ratio (Shares Offered / Shares Outstanding)	26.35%	30.48%	19.28%	26.78%

Table 5 – Descriptive Statistics of the Sample (Source: own illustration based on sample data)

²⁵ In millions of US dollars.

²⁶ In millions of US dollars.

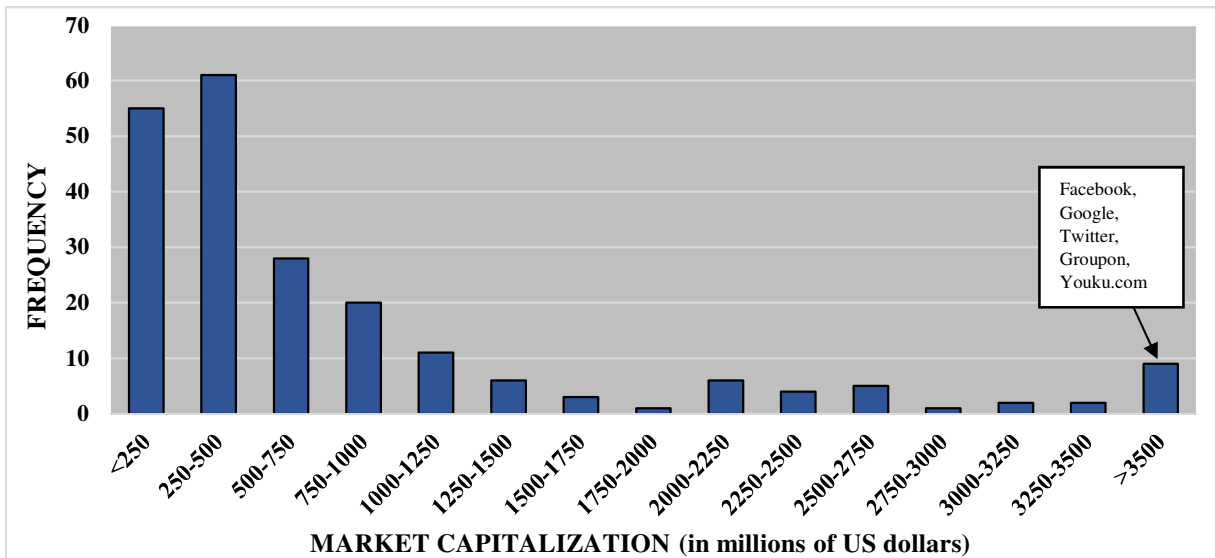


Figure 5 - Frequency Distribution of Firms' Market Capitalization at the time of the IPO.
(Source: own illustration based on sample data)

Table 5 shows also that the mean ratio of shares offered to total shares outstanding is 26.78%, meaning that, on average, internet related firms offered almost 27% of their total shares to the public through the IPO. This percentage is slightly lower for only underpriced IPOs, while it increases to more than 30% for overpriced ones. Additionally, Figure 6 shows the relation between the ratio of shares offered and the level of initial return for underpriced IPOs. IPOs are classified into different groups based on their initial returns ("0%-10%", "10%-20%" and so on); for each group of IPOs it is calculated the mean initial return and the mean ratio of shares offered and the results are graphically represented in Figure 6.

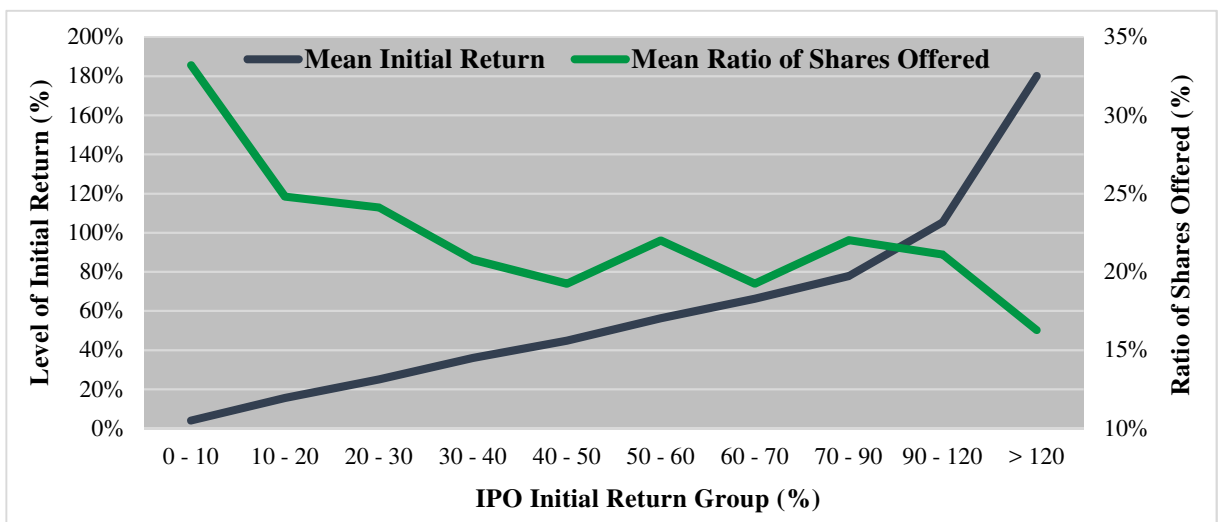


Figure 6 – The Relation between the Level of Initial Return for Underpriced IPOs and the Ratio of Shares Offered.
(Source: own illustration based on sample data)

Looking at the graph, it is possible to note that there seems to be a negative relation between IPO initial return and the ratio of shares offered: this is consistent with Grinblatt and Hwang (1989), who showed that there is a positive relationship between the retention rate and IPO

initial returns (that is to say that there is a negative relationship between the ratio of shares offered to shares outstanding and IPO initial returns) and that the decision to retain part of the shares issued is used by pre-IPO owners and managers to signal their optimism about firm's future prospects and value.

From Table 5, it is also possible to observe that there are relevant differences between underpriced, overpriced and correctly priced IPOs for what regards the average offer price and the average market capitalization at the time of listing. Indeed, the mean offer prices are \$15.32, \$12.55 and \$9.67 respectively for underpriced, overpriced and correctly priced IPOs. The differences are even bigger for the average market capitalization: more than \$2,067 million for underpriced IPOs, about \$800 million for overpriced IPOs and only \$292 million for correctly priced IPOs.

Moreover, I analysed how the level of initial return varies with firms' market capitalization (at the IPO). Table 6 reports six different ranges of market capitalization and the related mean initial return for the firms in sample; the same data are also graphically presented in Figure 7.

Range of Market Cap.	<250 million	250 – 500 million	0,5 – 1 billion	1 – 2 Billion	2 – 4 Billion	>4 Billion
Number of Companies	56	60	49	20	21	8
Mean Market Capitalization	\$153 million	\$360 million	\$723 million	\$1.29 billion	\$2.6 Billion	\$29 Billion
Mean Initial Return	18.05%	28.50%	38.98%	31.05%	62.15%	53.16%

Table 6 - Mean Initial Return for Different Range of Market Capitalization.
(Source: own illustration based on sample data)

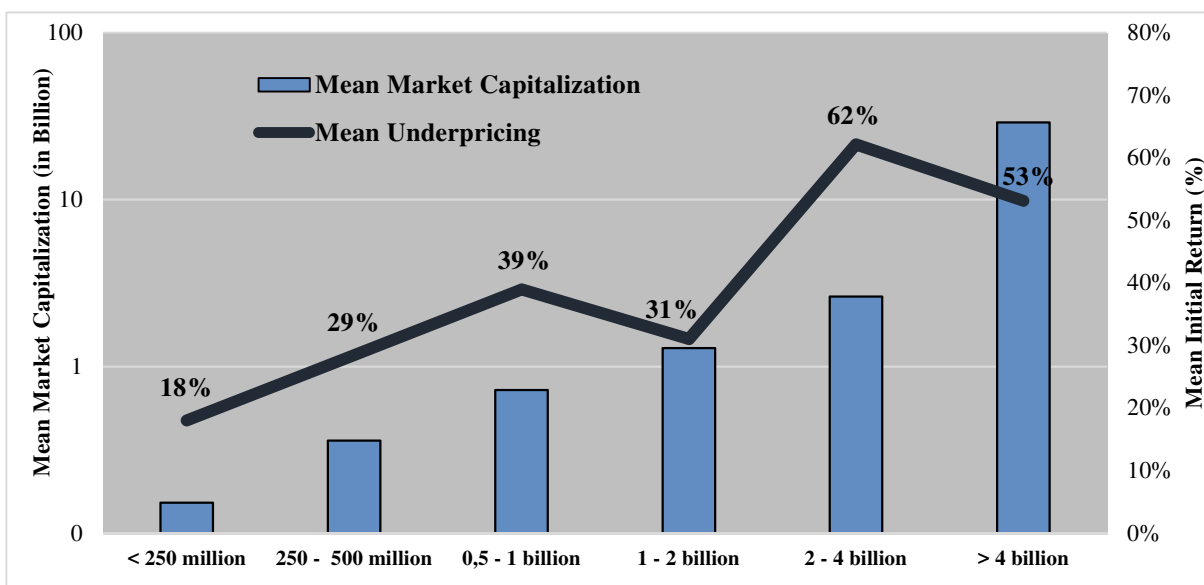


Figure 7 - Mean Initial Return for Different Range of Market Capitalization. Mean Market Capitalization is represented using a logarithmic scale to respond to skewness towards large values.
(Source: own illustration based on sample data)

It is possible to note that firms with a market capitalization in the ranges “2-4 billion” and “>4 billion” have a mean initial return significantly higher than firms in the other ranges. Nevertheless only 29 companies have a market capitalization higher than \$2 billion (21 companies are in the range “2-4 billion” and only 8 are in the range “>4 billion”), while most companies have a market capitalization lower than \$1 billion (about the 77% of the total sample). The range “250-500 million” includes the highest number of firms (60) and has a related mean initial return of 28.50%. Firms included in the first range of market capitalization (“<250 million”) have the lowest mean level of initial return (18.05%), while firms in the range “2-4 billion” have the highest one (62.15%).

As it can be observed in Figure 8²⁷, the sample firm with the highest market capitalization is Facebook. In the sample, only 7 companies (which means, the 3.3% of all companies analysed) have a market capitalization higher than \$10 billion but none of them is similar in size (market capitalization) to Facebook: indeed, Facebook’s market capitalization (\$104 billion) is more than four times Google’s market capitalization (about \$23 billion), which is the second highest value. So, when the IPO of Facebook is compared to the IPOs of the other biggest companies in the sample (in terms of company’s market capitalization), it must be considered the fact that the market capitalization of Facebook is much higher than that of all the other internet firms (and it can be considered an outlier value).

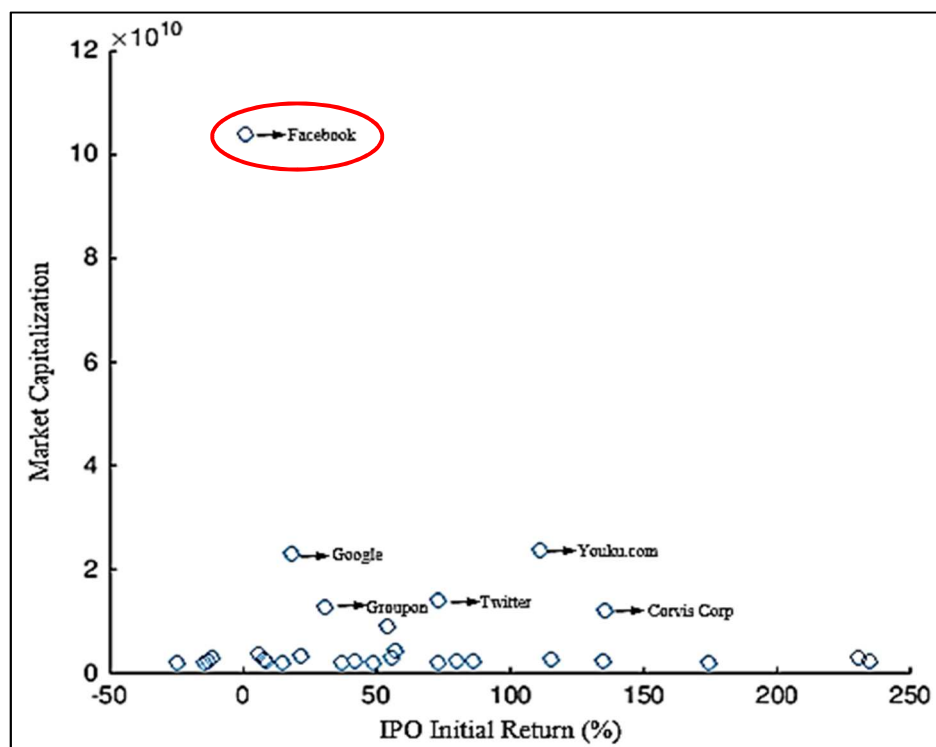


Figure 8 – Scatter Plot which shows Market Capitalization and Initial Return (for firms with a market capitalization higher than \$2 billion). (Source: own illustration based on sample data)

²⁷ Figure 8 is a Scatter Plot which shows Market Capitalization and Initial Return for firms with a market capitalization higher than \$2 billion. In Appendix A, it is reported the same Scatter Plot for all sample firms.

Considering only firms with a market capitalization higher than \$10 billion, it is possible to note from Table 7 that there are relevant differences between the IPO of Facebook and all the other IPOs, for what regards the initial return, the ratio of shares offered and the offer price.

Firms with Market Capitalization >10 billion	Initial Return (Mean)	Initial Return (Median)	Offer Price (Mean)	Ratio Shares Offered (Mean)
FACEBOOK IPO	0.61%	-	\$38.00	19.70%
All Other IPOs (Excluding Facebook)	61.29%	51.62%	\$32.55	6.04%

*Table 7 – Descriptive Statistics for only Firms with Market Capitalization “>10 billion”.
(Source: own illustration based on sample data)*

Facebook’s IPO is characterized by an initial positive return of 0.61%: it is the lowest initial return for the IPOs of firms with a market capitalization higher than \$10 billion. The mean and the median initial return for the other IPOs are respectively 61.29% and 51.62%. Among the companies with a market capitalization higher than \$10 billion, there are also Facebook’s competitors, Google and Twitter, whose IPOs are characterized by an initial underpricing of, respectively, 18.04% and 72.69%. So, despite the internet firms with a market capitalization higher than \$10 billion are characterized by an extremely high average level of underpricing and despite the IPO initial return seems to increase, on average, with the increase in firms’ market capitalization, Facebook (which is the firm with the highest market capitalization in the sample) has an IPO first-day return of only 0.61%.

The most relevant difference between Facebook’s IPO and other IPOs with a market capitalization higher than \$10 billion is related to the level of initial return: Facebook’s IPO significantly underperform with respect to other IPOs and to the IPOs of its competitors. Additionally, from Table 5, it is possible to observe that the ratio of shares offered in Facebook IPO (19.70%) is more than three times the mean ratio of other IPOs (6.04%) and the offer price at \$38 is more than 16% higher than the mean offer price (\$32.55) of other IPOs.

Furthermore, I also analysed how the level of underpricing varies in the period 2000-2013. Figure 9 shows that the level of initial return is not constant: it reaches its highest value in the years 2000-2001, and its lowest value in the years 2008-2009 (in Appendix A, it is reported a scatter plot which shows the distribution of IPO initial return in different years). The same trend can be also observed for the volume of IPOs: the highest number of IPOs is in the years 2000-2001, while the lowest one is in the years 2008-2009. This is coherent with Sindelar, Ritter and Ibbotson’s (1994) findings, who showed that both IPO volume and the degree of underpricing are cyclical, and that there are periods characterised by high average initial returns and an unusually high volume of offerings (which are known as “hot issue” markets) and periods

characterised by low degree of underpricing and low issuing volume (which are known as “cold” market).

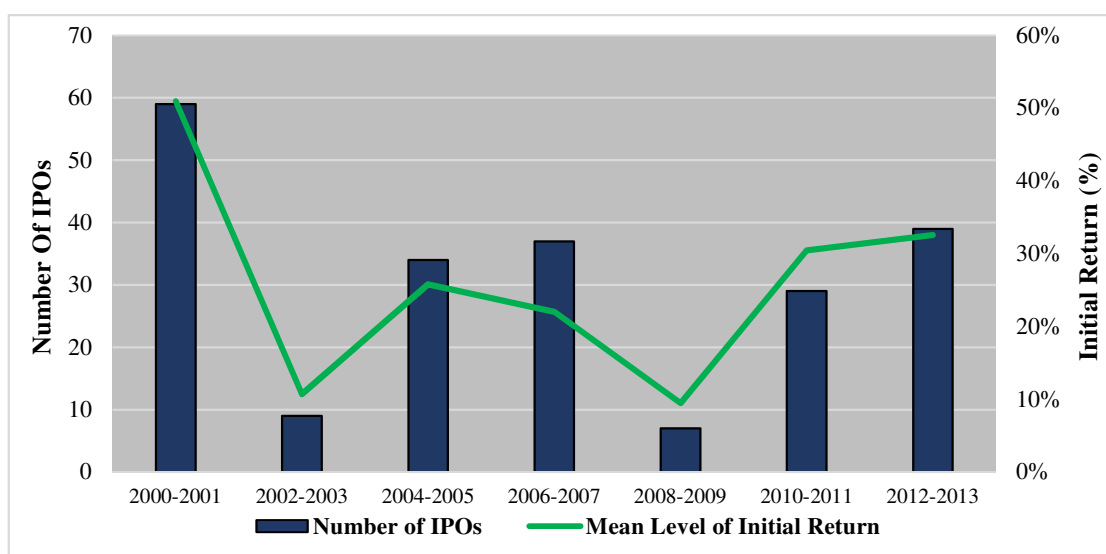


Figure 9 – Mean Level of Initial Returns and Volume of IPOs in different years. (Source: own illustration based on sample data)

In Table 8, internet-related IPOs are divided and aggregated by periods of years (“2000-2001”, “2002-2006”, “2007-2009”, “2010-2013”). This division is made to highlight the levels of underpricing in particular periods of time characterized by the presence the “Dot-com bubble” (2000-2001) and by the presence of the financial crisis (2007-2009).

Years	N° IPOs (Total)	N° IPOs per Year (Mean)	N° IPOs (Underpriced)	Percentage Underpriced IPOs	Mean Initial Return	Variance Initial Return
2000-2001	59	30	47	79.66%	50.97%	44.15%
2002-2006	61	12	48	78.69%	21.90%	23.41%
2007-2009	27	9	20	74.07%	19.20%	7.18%
2010-2013	67	17	52	77.61%	31.65%	14.01%

Table 8 - IPOs divided by Periods of Years. (Source: own illustration based on sample data)

The period 2000-2001 is characterized by the presence of the so called “Dot-com Bubble” which started in 1997, reached its peak in the first part of 2000 and then collapsed in 2002. These years are characterized by many IPOs of internet-related companies (about 30 IPOs per year), which are subject to excessive speculation. The table shows that the mean initial return in this period for internet-related IPOs in our sample is almost 51%, much higher than the other periods considered. In the years 2000-2001, both the number of IPOs per year and the variance of initial return are the highest of the periods taken into consideration. As it is possible to expect, the lowest average level of IPO underpricing (19.20%) and the lowest number of IPOs per year

(only 9) occur in the period 2007-2009, the years in which the financial crisis developed and strongly hit stock markets. Finally, the periods from 2002 to 2006 and from 2010 to 2013 present, respectively, an average underpricing of 21.90% and 31.65% and an average number of IPOs per year of 12 and 17. It is also interesting to note that there are no relevant differences in the percentage of underpriced IPOs (on the total IPOs) in the different periods, and that the percentage is between 74% (in the years 2007-2009) and 80% (in the years 2000-2001).

Facebook went public in 2012, in a period characterized by several successful internet-related IPOs. As it is possible to observe from Figure 9, the years 2012-2013 are characterized by the second highest average initial return and by the second highest volume of IPOs, after the ones of the “Dot-com bubble” period. So, excluding the years of the internet bubble (2000-2001), the period in which Facebook IPO was conducted is characterized by the highest levels of underpricing for internet-related IPOs.

In the period 2011-2013, several important internet companies and Facebook’s competitors went public: Facebook’s first day return (0.61%) is not only much lower than the average initial return of the total IPOs in the period 2010-2013 (31.65%²⁸), but also, as shown by Figure 10, it is not in line with the performance of the most important internet IPOs conducted in the same years. Facebook’s competitors, LinkedIn and Twitter, which went public in 2011 and 2013, realized extremely high IPO initial returns (109.44% and 72.69%). Additionally, Yandex N.V. and Groupon, the firms with the highest market capitalization after Facebook and Twitter (in the period 2011-2013), were characterized by an IPO underpricing of 55.36% and 30.55%.

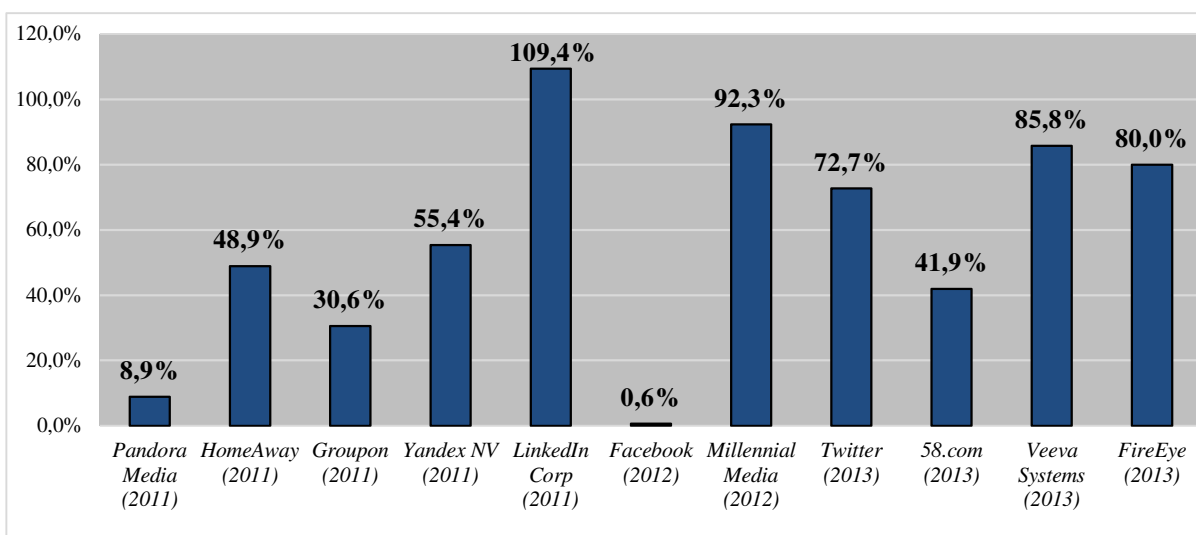


Figure 10 – Initial return for some of the most important internet-related IPOs of the period 2011-2013. (Source: own illustration based on sample data)

²⁸ See Table 8.

It is also important to analyse the age of the companies at the time of the IPO and how the level of underpricing varies with it, because generally, as showed by Ritter (1991), there is a negative relation between firm's age (at the time of going public) and the level of underpricing. Then, I analysed the age of sample internet firms and their relationship with IPO initial return to verify whether the firm's age at the time of the IPO influence the level of underpricing also for internet IPOs.

Table 9 shows that the mean age of internet-related companies is 8.43 years, while the median is 7 years. There are no relevant differences between the mean age of underpriced, overpriced and correctly priced IPOs. As shown by Figure 11, the vast majority of firms going public are less than 15 years old (about 92% of total companies); more in detail: 31.8% are companies with less than 5 years old, 43.9% are companies with an age between 6 and 10 years, 16.8% are companies with an age between 11 and 15 years, and only 7.5% are companies with more than 15 years old.

	Underpriced	Overpriced	Correctly Priced	Total
Mean Company Age	8.53	7.87	8.78	8.43
Median Company Age	7.00	7.00	9	7.00

Table 9 – Mean and Median Company Age at the Time of the IPO. (Source: own illustration based on sample data)

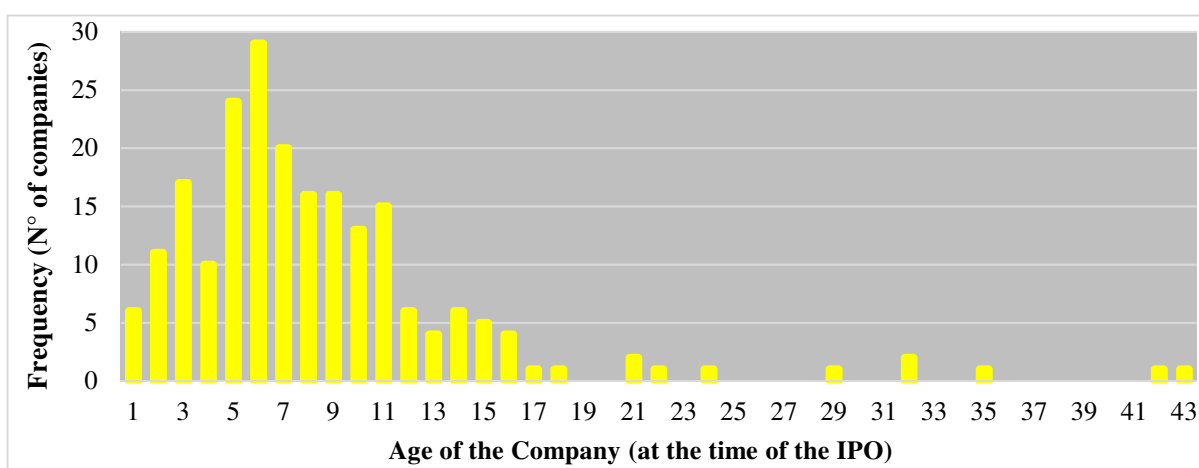


Figure 11 - Frequency Distribution of the Age of Issuing Firms. (Source: own illustration based on sample data)

In Table 10, IPOs are segmented by age of the companies at the time of the listing. All the IPOs are divided in three categories: the first category includes IPOs conducted by firms with 5 years old or less, the second category includes IPOs conducted by firms with an age between 6 and 10 years, the third category includes IPOs conducted by firms with more than 10 years old. It is possible to observe that there are important differences between the three categories. The youngest firms (belonging to the first category) show a mean initial return of 46.28%, which is much higher than the 27.80% and the 23.49% of the second and third category. IPOs

of young firms (5 or less years old) also exhibit the maximum and the minimum initial return of the total IPOs in the sample and the greatest difference between the mean and the median value (in all the categories the mean value of initial return is higher than the median value). These results are consistent with Ritter's (1991) findings, who demonstrated that there is a negative relation between firm's age (at the time of going public) and the level of underpricing, and explained that younger firms are generally associated with higher risks and greater ex-ante uncertainty, and that ex-ante uncertainty is positively related to IPO underpricing.

From Table 10, it can be also noted that the percentage of underpriced issues with respect to the total issues is nearly the same in the 3 age categories and that it is slightly lower than 80%.

Age (Range)	N° IPOs (Total)	N° IPOs (Underpriced)	Percentage Underpriced IPOs	Mean Initial Return	Median Initial Return	Maximum Initial Return	Minimum Initial Return
0 – 5	68	54	79.41%	46.28%	19.63%	353.85%	-25.50%
6 – 10	94	72	76.59%	27.80%	22.36%	168.73%	-22.56%
>10	52	41	78.84%	23.49%	11.97%	189.06%	-21.50%

Table 10 - IPOs divided by Age. (Source: own illustration based on sample data)

Figure 12 represents the data reported in Table 10. From the graph, it is possible to observe how the age of the firms at the time of the IPO influences the level of underpricing for the companies in the sample: the youngest internet-related firms ("Age 0-5") are characterized by the highest mean level of underpricing (46.28%, that increases to 60.81% if only underpriced IPOs are considered), while the oldest ones ("Age >10") are characterized by the lowest level (23.49%). Moreover, it is possible to observe that the highest number of IPOs is conducted by issuing firms in the age category "6-10" years, while the lowest number of IPOs is conducted by firms with more than 10 years.

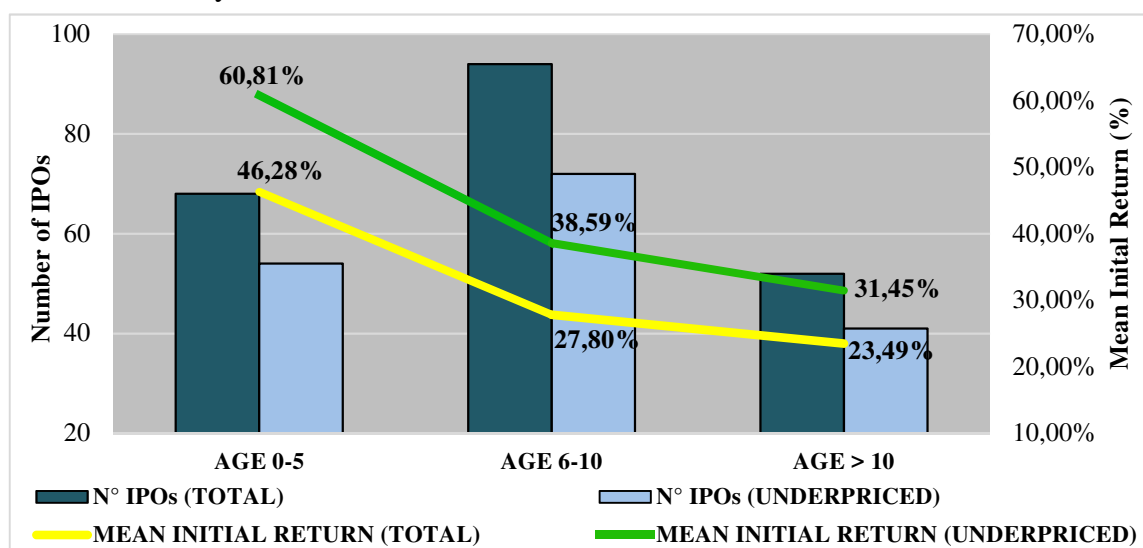


Figure 12 - Average Initial Returns and IPOs divided by Age. (Source: own illustration based on sample data)

Considering only internet firms with a market capitalization higher than \$10 billion, the average companies' age at the IPO is 5.29 years, that it is lower than the mean age of total firms in the sample (8.43 years). Nevertheless, firms with a market capitalization higher than \$10 billion are only 7 in the sample and their mean age is lowered by the values of Groupon's and Corvis Corporation's IPOs: indeed, the age range for firms with a market capitalization higher than 10 billion goes from 3 years (the age of Groupon and Corvis Corp. at the time of the IPO) to 8 years (the age of Facebook at the time of the IPO). As it is possible to note from Table 11, the age of Facebook at the IPO is in line with the age of its competitors; Facebook, Twitter, LinkedIn and Google are all included in the category "6-10" years (the age category that contains more than 43% of the total companies in the sample).

	Firms with Market Capitalization >10 billion (Mean)	Facebook	Groupon	Google	Twitter	LinkedIn²⁹
Age (Years)	5.29	8	3	6	7	9

Table 11 – Age at the time of the IPO for firms with Market Capitalization higher than 10 billion. (Source: own illustration based on sample data)

Finally, Table 12 and Figure 13 show the mean and the frequency distribution of underwriters' ranks for IPOs in the sample. The mean underwriter rank is 8.44 and it is, on average, slightly higher for underpriced IPOs (8.52) than for overpriced ones (8.08). About 70% of IPOs are marketed by underwriters that have rank 9 (73.05% of underpriced IPOs and 63.16% of overpriced), while only 11.7% of all IPOs are marketed by underwriters with rank inferior to 8. Consequently, assuming that most prestigious and reputed underwriters have a rank equal or higher than 8, more than 88% of all IPOs in the sample are marketed by the most prestigious investment banks. The most important internet-related IPOs and all the firms with a market capitalization higher than \$2 billion (including Facebook's IPO) are marketed by underwriters that have rank 9, which are: Morgan Stanley, Goldman Sachs, J.P. Morgan, Citigroup, Credit Suisse, Deutsche Bank, Bank of America – Merrill Lynch and Salomon Smith Barney.

	Underpriced	Overpriced	Correctly Priced	Total
Mean Underwriter Rank	8.52	8.08	8.39	8.44
% Underwriter with Rank = 9	73.05%	63.16%	55.56%	70.09%

Table 12 - Underwriter Rank. (Source: own illustration based on sample data)

²⁹ LinkedIn's market capitalization at the time of the IPO is lower than 10 billion, but it is included in Table 11 because it is one of the most important Facebook's competitors.

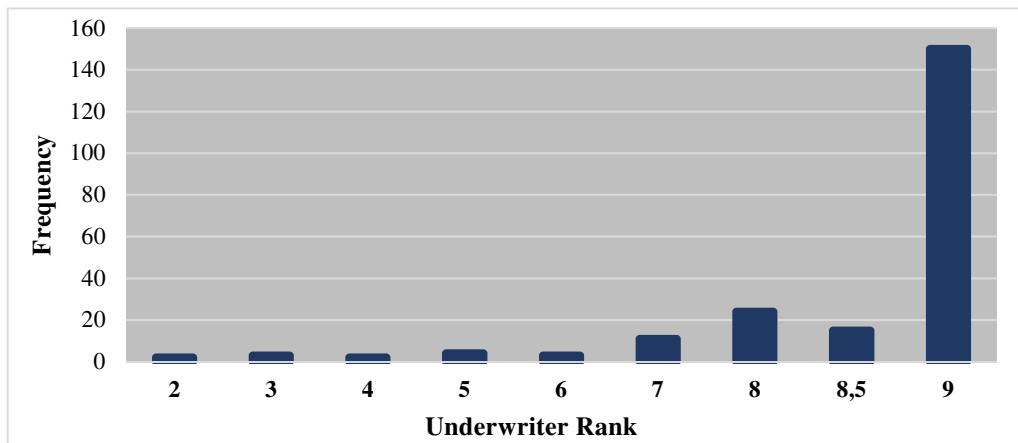


Figure 13 – Frequency Distribution of Underwriter Rank. (Source: own illustration based on sample data)

3.5 - RESULTS

From the descriptive analysis, it has been observed that internet-related IPOs conducted in the period between 2000 and 2013 have, on average, high levels of initial return and that almost 80% of the total IPOs are underpriced: 167 on the total 214 internet IPOs analysed are underpriced and the average level of underpricing is 32.63% (the median underpricing is 18.42%, meaning that initial returns have a positively skewed distribution). Considering that the average underpricing for U.S. IPOs in the period 2001-2016 is 14%³⁰, it is possible to conclude that internet firms are generally characterized by high levels of underpricing.

The analysis shows that initial returns are, on average, substantially higher for younger firms and decrease with the increase in the firms' age. The issuing firms of the sample have an average and median age (at the time of their IPO) of, respectively, 8.43 years and 7 years: 31.8% are companies with less than 5 years old, 43.9% are companies with an age between 6 and 10 years, and 24.3% are companies with less than 10 years old. It has been noted that youngest firms have the highest mean level of initial returns and oldest firms the lowest level: the mean initial return is 46.28% for companies with less than 5 years old, 27.80% for companies with an age between 6 to 10 years and 23.49% for companies with more than 10 years old. Additionally, it has also been observed that the average level of initial return and the volume of internet-related IPOs change over time: as expected, both the initial return and the volume of IPOs reach their highest levels during the years 2000-2001 (characterized by the presence of the “Dot-com Bubble”) and their lowest levels during the financial crisis of 2007-2009. The average initial

³⁰ Source: “IPO Statistics for 2016 and Earlier Years” Ritter, J.R. (2017); available on available on Jay R. Ritter’s website. See: <https://site.warrington.ufl.edu/ritter/ipo-data/> [Accessed 7 November 2017]

return for internet IPOs in the sample is 50.97% in the years 2000-2001, 21.90% in the years 2002-2006, 19.29% in the years 2007-2009 and 31.65% in the years 2010-2013.

These results are consistent with the findings of Loughran and Ritter (2002), Ljungqvist and Wilhelm (2003), Lowry and Schwert (2002), and Lowry, Officer and Schwert (2010). They demonstrated that internet related firms (together with high-tech firms) and younger companies are generally characterized by severe underpricing and that the highest levels of underpricing occurred during the Internet bubble: Loughran and Ritter (2002) and Ljungqvist and Wilhelm (2003) showed that the years 1999-2001 were characterized by average levels of underpricing higher than 50% for tech and internet related firms and Lowry, Officer and Schwert (2010) added that those years were characterized not only by the highest level of underpricing but also by the highest volatility of IPO initial returns. The analysis is also consistent with Sindelar, Ritter and Ibbotson's (1994) findings, who demonstrated that both IPO volume and the degree of underpricing are cyclical and vary over time and with Ritter's (1991) findings, who showed that there is a negative relation between firm's age and the level of initial underpricing.

The descriptive analysis performed shows also that most companies in the sample have a market capitalization lower than \$1 billion (about 77% of total issuing firms), but that the companies with a market capitalization included in the range "2-4 billion" and ">4 billion" have the highest mean levels of initial return: issuing firms with a market capitalization lower than \$250 million have the lowest mean of initial return (18.05%), while firms with a market capitalization between \$2 and \$4 billion have the highest one (62.15%). Moreover, it has been noted that underpriced IPOs are characterized by a lower ratio of shares offered compared to overpriced IPOs, and that there seems to be a negative relation between the level of initial return and the ratio of shares offered by issuing firms. Finally, the analysis reports that more than 88% of all internet IPOs of the sample (and all internet IPOs with a market capitalization higher than \$2 billion) are marketed by the most prestigious and reputed underwriters.

Considering Facebook's IPO, the analysis shows that it is characterized by a positive first-day return of only 0.61%, much lower than the sample mean level of underpricing (32.63%). In terms of firm's market capitalization (at the time of the IPO), Facebook is the biggest internet companies in the analysed period and the underperformance of Facebook's IPO is particularly evident with respect to the IPOs of the other biggest companies in the sample. Indeed, considering all the IPOs of firms with a market capitalization higher than \$10 billion, Facebook IPO has the lowest initial return: the other most market capitalized companies (the ones with a market capitalization higher than \$10 billion) are characterized by an extremely high average

level of underpricing (61.29%). Facebook's IPO performance is also not in line with the IPOs performance of its competitors, in particular with LinkedIn's and Twitter's IPOs that are characterized by an initial return of 109.44% and 72.69%.

From the descriptive analysis performed, it is not possible to understand the factors that caused the abnormal performance of Facebook's IPO. The period in which Facebook's IPO is launched is the period with the highest average level of underpricing after the "Dot-com bubble period", and it is characterized by several successful large internet-related IPOs (as it shown in Figure 10). Moreover, the age of Facebook at the time of the offering is line both with the mean age of internet firms in the sample and with the age of its competitors; additionally, Facebook's IPO is marketed by the most prestigious and reputed underwriters like all the other major IPOs.

The most important differences that the analysis highlights between Facebook and the other highly market capitalized firms are related to the ratio of shares offered in the IPO and to the level of market capitalization: the ratio of shares offered in Facebook's IPO is more than three times the mean ratio of the other IPOs and Facebook's market capitalization is more than four times Google's one, that is the second highest market capitalization of the sample. The extremely high market capitalization at the IPO is based on the final offer price set by underwriters and so on the implied valuation accorded to Facebook at the IPO; while the high ratio of shares offered is due to the strong insider selling of pre-IPO owners and managers in Facebook's offering.

In Chapter 4, it is described all the Facebook's IPO process, the stock market debut and the short-term negative stock performance. Particularly, it is analysed if the abnormal performance of the offering is caused by the offer price set by underwriters and so by the valuation of the company at the IPO. In next chapter, different elements and factors are analysed to study the Facebook case: only considering the unique characteristics and problems of Facebook's IPO it is possible to explain its negative performance.

CHAPTER 4 – THE FACEBOOK IPO CASE

4.1 - INTRODUCTION

The analysis presented in the previous chapter shows that almost 80% of IPOs in the sample are underpriced and that internet-related IPOs are, on average, characterized by high levels of underpricing. Considering the most important internet-related IPOs conducted in the period 2000-2013, it is possible to note that most of them had extremely high positive initial returns: for example, LinkedIn's shares gained more than 100% on their first day of trading, Twitter's shares jumped up by almost 73%, Yandex N.V.'s shares and Groupon's shares realized a gain of, respectively, more than 55% and more than 30%. Nevertheless, the biggest³¹, most hyped and most anticipated Internet related IPO of this period, that is Facebook IPO, was not characterized by high initial returns: Facebook's shares were not underpriced and realized a negative performance in the first months after the stock market debut. The initial weak stock performance disappointed investors, which were expecting a short-term stock price increase: indeed, at the time of the listing, Facebook was "the most popular internet service in the world" (Lai and Wu, 2014, p.2) and its IPO received a lot of attention during the road show and created enthusiasm among investors. Facebook went public on May 18, 2012 and was listed on NASDAQ at an offer price of \$38 per share; the IPO raised about \$16 billion and valued the company more than \$100 billion. Facebook's shares closed the first day of trading at \$38.23 (in line with the offer price), the next day they closed at \$34.03 and then at \$31.00 after three days of trading. On August 31, the closing price was \$18.06, meaning that shares had fallen by more than 50% in three months. As it is possible to observe from Figure 14, the stock price trend did not reflect the positive expectations that had been created during marketing activities and a lot of problems and controversies arose in the days following the IPO. The initial public offering of Facebook is today considered by some authors "the most important failed IPO in the history of American capital markets". (Diamond, 2012, p.2).

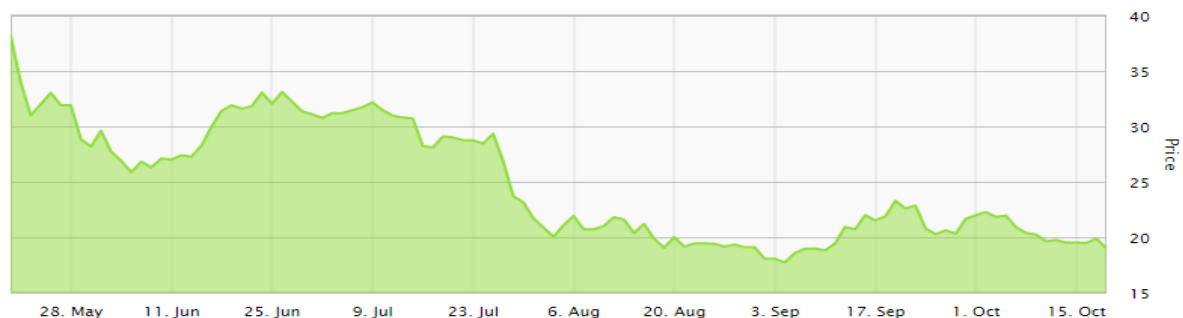


Figure 14 – Facebook Stock Chart. The first five months after the IPO. (Source: amigobulls.com)

³¹ Today, Facebook IPO is the second largest Internet related IPOs of all time; Alibaba IPO, which raised \$25 billion, became the largest IPO in 2014.

This chapter reports and analyses the reasons of the negative stock performance after the Facebook's initial public offering. Different causes are taken into consideration to explain the failure of the IPO: the reason of the offering, the final price set by the underwriter, the valuations made by analysts, the number of shares offered, the portion of shares sold by pre-IPO owners and the ownership structure after the IPO. Particularly, I will estimate the value of the company at the time of the IPO and compare it to the value implied by the IPO offer price, in order to determine whether the company was overvalued or correctly priced.

In the following paragraphs, it is firstly analysed the business and the economic performance of Facebook before the IPO; then it is described the IPO process and the problems arisen the last days before the offering. In the second part of the chapter, it is reported the valuation of the company performed using DCF methodology. Finally, it is discussed the causes of Facebook's IPO failure and the reasons of the short-term bad stock performance.

4.2 - FACEBOOK BEFORE THE IPO

Facebook Inc. is an American company which offers social networking services, and which owns the social media platform "Facebook". Facebook website (the original name was TheFacebook.com) was founded on February 4, 2004 by Mark Zuckerberg and other four Harvard college students and it is today based in Menlo Park (California). Facebook's mission, as reported in the company's website and in the Registration Statement, is "to make the world more open and connected" and "to give people the power to build community and bring the world closer together. People use Facebook to stay connected with friends and family, to discover what's going on in the world, and to share and express what matters to them".

As it is possible to note from Figure 15, Facebook had 360 million of Monthly Active Users worldwide (MAUs) at the end of 2009, 608 million MAUs at the end of 2010 and 845 million MAUs at the end of 2011, which means that monthly active users increased of about 69% and 39% in the two years before the IPO. Considering Daily Active users, the growth was even stronger: Facebook had 185 million of Daily Active Users worldwide (DAUs) at the end of 2009, 327 million DAUs at the end of 2010 and 483 million DAUs at the end of 2011, meaning a growth of 77% and 48% respectively in 2010 and 2011. Additionally, as reported in the prospectus of the Registration Statement, at the end of 2011, Facebook had more than 425 million MAUs who used Facebook mobile products; all the users generated an average of 2.7

billion Likes and Comments per day and, on average, more than 250 million photos per day were uploaded on the social network.

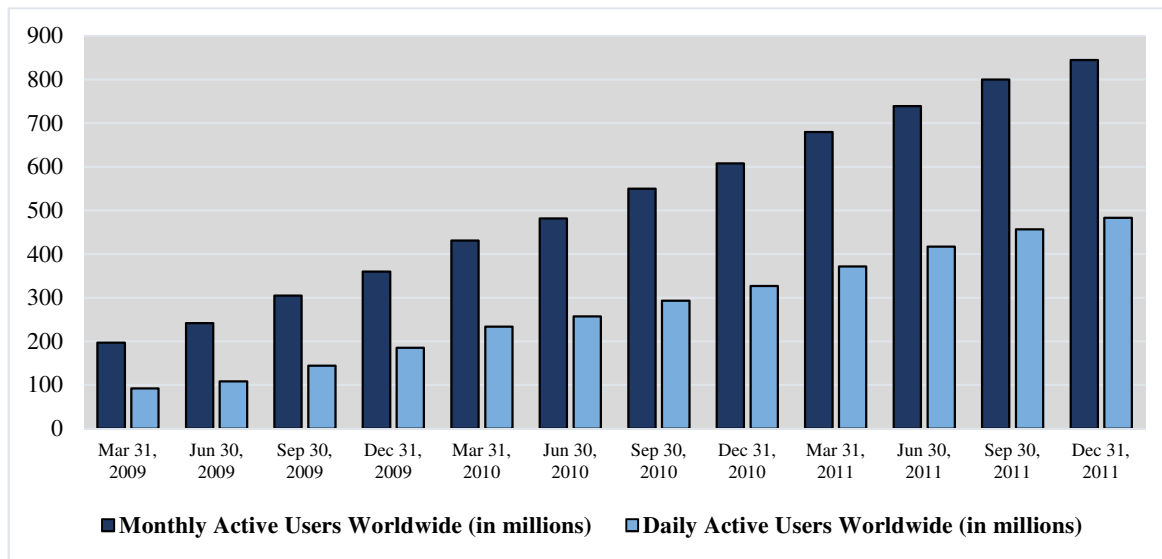


Figure 15 – Monthly and Daily Facebook Active users worldwide. (Source: own illustration based on Facebook’s Registration Statement, February 2012)

Since the half of 2007, Facebook has been one of the ten most visited websites in the world and, since 2008, when Facebook surpassed Myspace, it has been also the most popular social networks. As shown in Figure 16, in 2011, Facebook had a US market share³² in the segment of social-networking sites of almost 65%, more than three times higher than YouTube’s market share. Twitter, one of the closest Facebook’s competitors (considering the services and the functions offered by the two social networks), had a market share of 1.4%; while LinkedIn had a market share of only 0.6%. Google+, which was launched in June 2011, had a market shares lower than 0.5% (in the graph, Google+’s market share is included in the category “Other”).

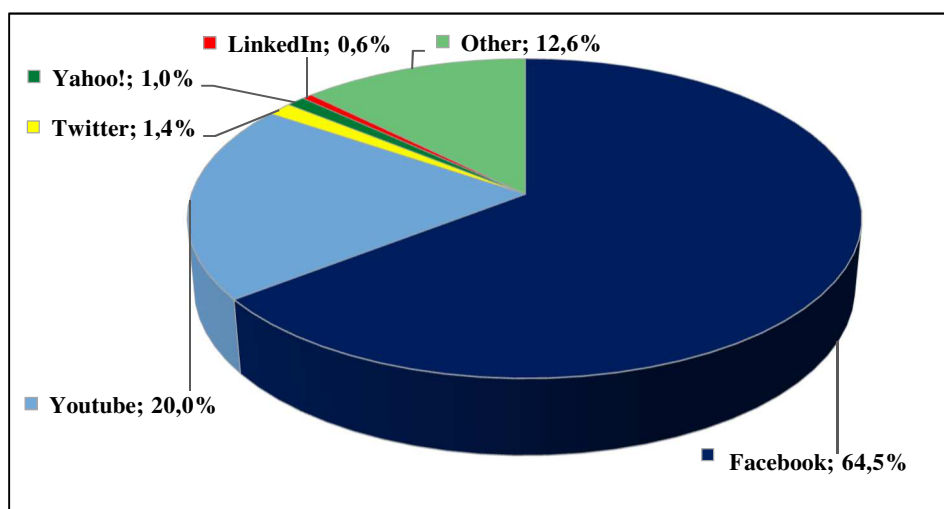


Figure 16 – US Market Shares of Social-Networking Sites in 2011 (Source: own illustration based on Experian Hitwise, 2011)

³² Market shares is based on the number of social networks’ visits.

Facebook Financial Results

Facebook reported revenue of \$3,711 million in 2011, with an increase of 88% over 2010 revenue of \$1,974 million. Facebook 2011 revenue were almost five times its 2009 revenue (\$777 million) and nearly fourteen times its 2008 revenue (\$272 million)³³. As shown by Table 13, all the revenues were generated from advertising and from fees associated with Facebook Online Payments Infrastructure, which enables users to purchase virtual and digital goods from the Platform: advertising accounted for 98%, 95% and 85% of Facebook revenue respectively in 2009, 2010, 2011. Advertising revenues increased by 145% in 2010, and by 69% in 2011; while payments and other fees revenues increased from \$13 million in 2009 to \$557 million in 2011.

The 2011 revenue increase was primarily due to the growth of advertising revenue which grew thanks to a “42% increase in the number of ads delivered and an 18% increase in the average price per ad delivered” (Facebook’s Registration Statement, February 2012, p.50) and to the strong growth of fees generated by Facebook Payments Infrastructure, that started to generate significant revenue in 2011 because “Facebook Payments became mandatory for all game developers accepting payments on the Facebook Platform” (Facebook’s Registration Statement, February 2012, p.50).

About 56% of total 2011 revenue were generated in United States, but this percentage was decreasing (it was 67% in 2009 and 62% in 2010) because revenues generated in Western Europe, Canada and Australia had started to grow rapidly thanks to the fast expansion of international users. Moreover, 12% of 2011 revenue and almost 10% of 2010 revenue came from a single costumer, the game-maker Zynga: this revenue consisted of direct advertising purchased by Zynga and of payments processing fees related to the sales of virtual goods (Facebook Payments was the primary means of payments used by Zynga’s games).

Revenue	2009	2010	2011	% Change 2009 to 2010	% Change 2010 to 2011
Total Revenue	\$ 777	\$ 1,974	\$ 3,711	154%	88%
Advertising Revenue	\$ 764	\$ 1,868	\$ 3,154	145%	69%
% on Total Revenue	98%	95%	85%		
Payments and Other Fees	\$ 13	\$ 106	\$ 557	NM	425%
% on Total Revenue	2%	5%	15%		

Table 13 – Facebook’s Revenue 2009-2011. Data in millions of US Dollars. (Source: own illustration based on Facebook’s Registration Statement, February 2012)

³³ See Appendix B: “Consolidated Income Statement from 2007 to 2011”.

Consolidated Income Statement	2009	2010	2011
Revenue	\$ 777	\$ 1,974	\$ 3,711
Cost of Revenue	\$ 223	\$ 493	\$ 860
Marketing and Sales	\$ 115	\$ 184	\$ 427
Research and Development	\$ 87	\$ 144	\$ 388
General and Administrative	\$ 90	\$ 121	\$ 280
Total Costs and Expenses	\$ 515	\$ 942	\$ 1,955
Income (Loss) from Operations	\$ 262	\$ 1,032	\$ 1,756
Other Expenses	\$ 8	\$ 24	\$ 61
Provision for Income Taxes	\$ 25	\$ 402	\$ 695
Net Income	\$ 229	\$ 606	\$ 1,000

Table 14 - Consolidated Income Statement. Data in millions of US Dollars. (Source: own illustration based on Facebook's Registration Statement, February 2012)

At the end of 2011, operating income was \$1,756 million (increased by 70% over 2010), net income was \$1,000 million (increased by 65% over 2010) and the company had a healthy 27% of net profit margin. This was the third year of positive net income (as it possible to note from Figure 17): indeed, until 2008 the company was making losses and it became profitable in 2009 with a net income of \$229 million³⁴.

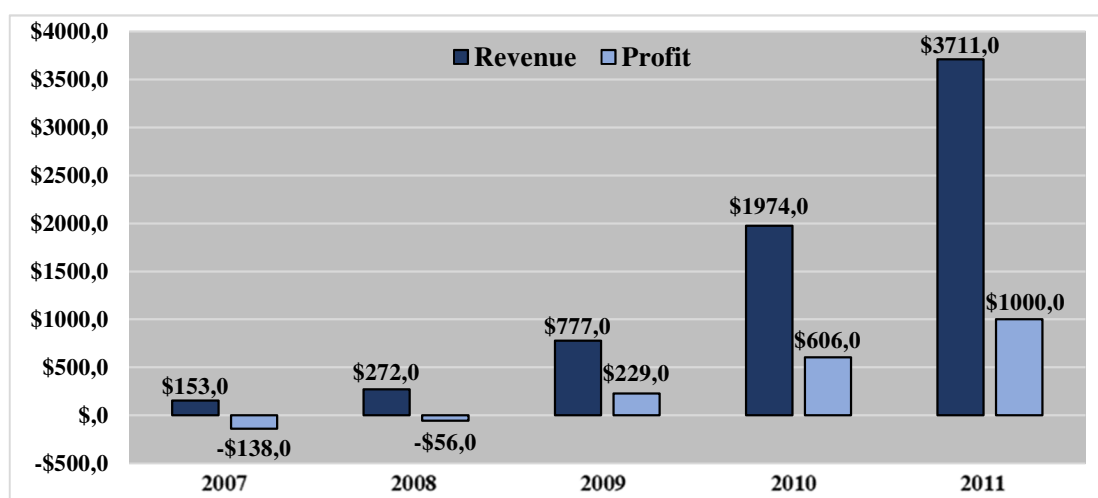


Figure 17 – Facebook's Revenue and Net Profit from 2007 to 2011. Data in millions of US Dollars. (Source: own illustration based on Facebook's Registration Statement, February 2012)

Facebook net income growth was smaller (65% in 2011) compared to revenue growth (88% in 2011) due to the strong increase of costs and expenses incurred: cost of revenue (costs related to the expansion of Facebook data centre operations) increased of 74%, marketing and sales of 132%, research and development of 169% and, finally, general and administrative expenses increased of 131%. Particularly, research and development costs grew from \$87 million in 2009 to \$388 million in 2011 (more than 10% of total 2011 revenue): R&D expenses included investments sustained to improve existing products and create new ones. As stated in the

³⁴ See Appendix B: "Consolidated Income Statement from 2007 to 2011".

prospectus of Facebook's IPO, all these costs were expected to further increase both in the dollar amount and as a percentage of revenue to support user growth and enhance user engagement.

ASSETS	2010	2011	LIABILITIES AND EQUITY	2010	2011
Total Current Assets	\$ 2,246	\$ 4,604	Total Current Liabilities	\$ 2,246	\$ 4,604
Cash and Cash Equivalents	\$ 1,785	\$ 1,512	Accounts Payable	\$ 29	\$ 63
Marketable Securities	-	\$ 2,396	Platform Partners Payable	\$ 75	\$ 171
Accounts Receivable	\$ 373	\$ 547	Current Capital Lease obligat.	\$ 106	\$ 279
Prepaid Expenses	\$ 88	\$ 149	Other Current Liabilities	\$ 179	\$ 386
Property and Equipment	\$ 574	\$ 1,475	Capital Lease Obligations	\$ 117	\$ 398
Goodwill and Intangible	\$ 96	\$ 162	Long Term Debt	\$ 250	-
Other Assets	\$ 74	\$ 90	Total Liabilities	\$ 72	\$ 135
			Stockholders' Equity	\$ 2,162	\$ 4,899
Total Assets	\$ 2,990	\$ 6,331	Total Liabilities and Equity	\$ 2,990	\$ 6,331

Table 15 - Consolidated Balance Sheet. Data in millions of US Dollars. (Source: own illustration based on Facebook's Registration Statement, February 2012)

As reported in the consolidated balance sheet at 31 December 2011³⁵, company's total assets increased from \$2,990 million in 2010 to \$6,331 million in 2011, thanks to the increase in cash equivalents and marketable securities (which reflected the increase in the cash generated by operations) and to the increase in property and equipment. Cash used in investing activities was primarily related to the purchase of property and equipment which were essential to support the expansion of the business: the amount of property and equipment reported in the consolidated balance sheet of 2011 was ten times higher than the amount reported in the consolidated balance sheet of 2009 (\$148 million³⁶). Facebook principal commitments were related to capital lease obligations (which increased during 2011, in line with the increase of property and equipment), used to finance property and equipment and data centre facilities; while there were no other long-term debts (long-term debts were \$ 250 million at the end of 2010, but they were all repaid during the first half of 2011). Facebook principal sources of liquidity were cash and cash equivalents, marketable securities and cash generated from operations; as stated in the company's IPO prospectus, at the end of 2011, Facebook had available funds and cash flows from operations sufficient to meet its operational cash needs for the foreseeable future. Finally, the increase in stockholders' equity reported in the 2011 balance sheet was primarily due to the

³⁵ See Appendix B for the detailed "Consolidated Balance Sheet" reported in Facebook's Registration Statement (February 2012).

³⁶ See Appendix B: Consolidated Balance Sheet Data (2007-2011).

increase in “Retained earnings” (that increased of \$1,000 million, since the full amount of 2011 net income was added to the previous retained earnings) and to the increase in “Additional paid-in capital”.

Opportunities, Strategies and Risk Factors

As reported in the prospectus of Facebook’s IPO, total worldwide advertising spending in 2010 was \$588 billion, while online advertising spending was forecasted to increase from \$68 billion in 2010 to \$120 billion in 2015. As it is possible to note from Figure 18, “online” advertising (also called “internet” advertising) was the third most used advertising media after “television” and “newspapers”. Additionally, considering total worldwide spending in the period between 2007 and 2011, Figure 18 shows that “internet” advertising was rapidly acquiring market shares at the expense of the other advertising media. Indeed, “internet” advertising’s market share increased from 8.5% in 2007 to more than 15% in 2011 while, except “Television” advertising which had a market share quite stable (37% in 2007 that increased to 39% in 2009), all the other most used advertising media lost market share: “newspapers” advertising’s market share decreased from 27% in 2007 to 21% in 2011, “magazines” advertising’s market share passed from more than 12% to less than 10% in the same period and, finally, “radio” advertising’s market share passed from 8% to 7%. Given the increasing diffusion of internet worldwide, it was possible to expect that internet advertising would have continued to acquire importance and market share in the following years: since Facebook revenue came mostly from online advertising, the growth of this sector represented an important opportunity also for the growth of the company.

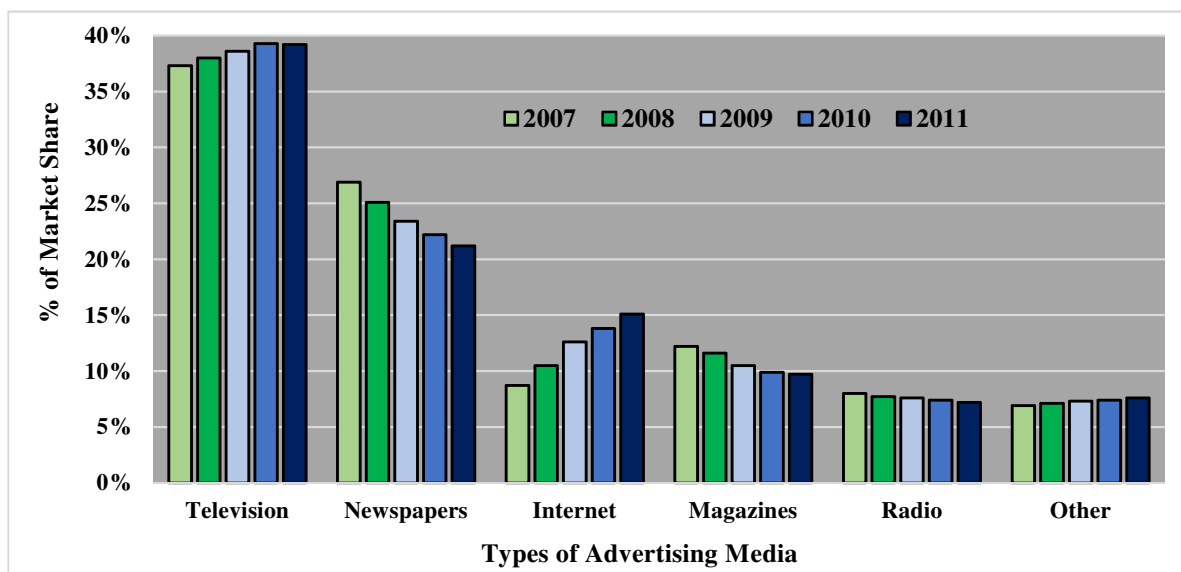


Figure 18 – Worldwide Advertising Spending Share, By Media (Source: own illustration based on Digital Strategy Consulting and ZenithOptimedia)

From Table 16, it is possible to observe that Facebook in 2011 was the third company by market share in the US online advertising market. Particularly, it can be noted that its 2011 market share (7.7%) was more than three times higher its 2009 market share (2.4%); in the same years, Yahoo’s market share decreased from 16.1% to 11.9%, while Google’s market share increased from 34.9% to 43.5%. In 2011, Google was by far the leader of US online advertising market, but it was also the world’s leading search engine and it had more than 66%³⁷ of total US search engine traffic.

	2009	2010	2011
Google	34.9%	38.9%	43.5%
Yahoo	16.1%	13.4%	11.9%
Facebook	2.4%	4.7%	7.7%

Table 16 – Top 3 US Online Adv. Selling Companies, by Market Share (measured as % of Total US Online Adv. Revenue). (Source: own illustration based on eMarketer, 2011)

Facebook’s market share was increasing (on the online advertising market) thanks, above all, to the success of the advertising on the social network: Facebook offered the possibility to accurately target the audience of each advertisements using all the different information collected by the social network (like demographic information, interests, hobbies, connections, location etc.) and this was one the most relevant elements needed by all advertisers. Facebook created and offered advertising solutions “designed to be more engaging and relevant for users in order to help advertisers better achieve their goals” (Facebook’s Registration Statement, February 2012, p.78). Facebook had a significant market opportunity because advertising on the social web was still emerging and evolving; advertisers were still experimenting with the best ways to leverage the social network to create and spread valuable ads.

Additionally, also Facebook Payment infrastructure had important growth opportunities because was employed only for the purchase of virtual goods used in social games: its use could be improved and extended to other kind of apps. The prospectus reported that the worldwide revenue generated from the sale of virtual goods were \$2 billion in 2007, \$7 billion in 2010 and were expected to increase to \$15 billion by 2014. Facebook Payment started to generate relevant revenue in 2011, and it was important for Facebook to continue the development of the Payment Platform because, until 2010, Facebook depended on only advertising revenue.

Facebook’s strategy was focused, first of all, on growing its costumer and user base across all markets (including the less-penetrated ones) by enhancing its products, investing in marketing and launching new mobile apps: Facebook developers prioritized investments in product

³⁷ Source: Experian Hitwise (2011)

development with the aim of increasing user engagement and improving Facebook experience both on the website and on mobile devices. The social network was investing with the primary goal of expanding its global user community and rendering Facebook available to more people in the world. Figure 19 shows that Facebook was increasing its presence across all the continents: Facebook’s global penetration rate (measured as % of internet users) increased from 24.5% at the end of 2010 to 31.6% at the end of 2011. More in details, Facebook’s penetration strongly increased in Latin America (from 30.8% to 48.0%), in Middle East & Africa (from 30.9% to 46.2%), in Western Europe (from 31.7% to 40.3%) and in Eastern Europe (from 25.5% to 31.1%); while in North America it passed from 52.6% to 57.3%. In Asia-Pacific region, penetration rate increased from 11.0% to 15.7%³⁸; nevertheless, Facebook’s penetration in this region remained low because its usage was not allowed in China, due to the country’s ban on the social network.

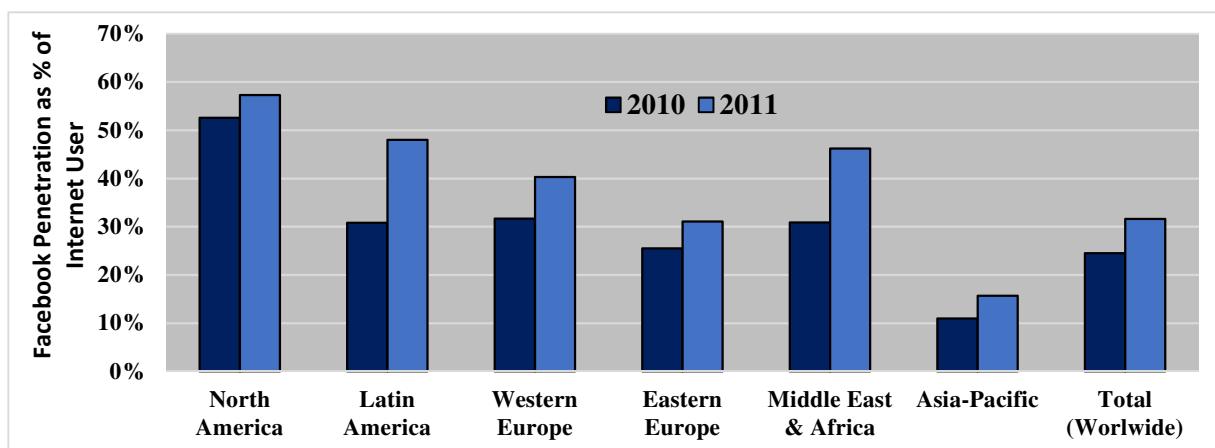


Figure 19 – Facebook User Penetration Worldwide in 2010 and 2011, as % of Internet Users.
(Source: own illustration based on eMarketer, 2012)

The other key element of the strategy regarded the improvement of ad products usable by advertisers: Facebook believed that social, relevant and well-integrated ad products could enhance user experience and, at the same time, provide significant returns for advertisers. Facebook offered different advertising solutions, which included video ads, photos ads, banner ads, the creation of events, Facebook pages and sponsored stories in News Feed. The company intended to create and test new additional products for marketers and advertisers, “while continuing to balance [...] monetization objectives with [Facebook’s] commitment to optimizing the user experience” (Facebook’s Registration Statement, February 2012, p.81).

However, Facebook’s business was also characterized by relevant risk factors. Firstly, the company’s revenues were strictly linked with the capacity of retaining existing users and adding new ones. If Facebook’s MAUs and DAUs started to decline, the performance and financial

³⁸ Source of Data: “Facebook User Penetration Worldwide” (eMarketer, 2012)

results of the company would have got worse; so, growth trends in MAUs and DAUs were critically important for the performance of the company. Moreover, the substantial majority of revenue came from advertising and advertisers did not have long-term advertising commitment with Facebook: if Facebook new and experimental ads failed to prove successful, it would have lost most of its advertisers.

Another important problem was related with Facebook’s mobile products. Facebook user growth was mostly due to new mobile users; however, ads were not displayed on mobile devices and so the social network was not able to generate relevant revenue from Facebook mobile products. Indeed, in 2011, a successful monetization strategy for mobile users was still not be developed and this represented a critical issue for Facebook. As shown in Figure 20, US Mobile internet advertising had started to increase rapidly: it increased of 64.1% in 2010, of 143.8% in 2011 and of 119.9% in 2012. Non-Mobile advertising accounted for almost 95% of total US online advertising in 2011, but the percentage decreased to 90% in 2012³⁹. Mobile advertising was growing at really high rates: as reported in Facebook’s IPO prospectus (p.79), “the global mobile advertising market was \$1.5 billion in 2010 and [was] expected to grow at a 64% compound annual rate to \$17.6 billion in 2015”. So, Facebook needed to create and implement a successful monetization strategy for its mobile products, because it already had more than 425 million MAUs in 2011 who utilized its mobile products and an important part of its users was substituting Facebook’s desktop website with Facebook’s mobile website or mobile app; and, also, because advertisers were increasingly investing in mobile advertising.

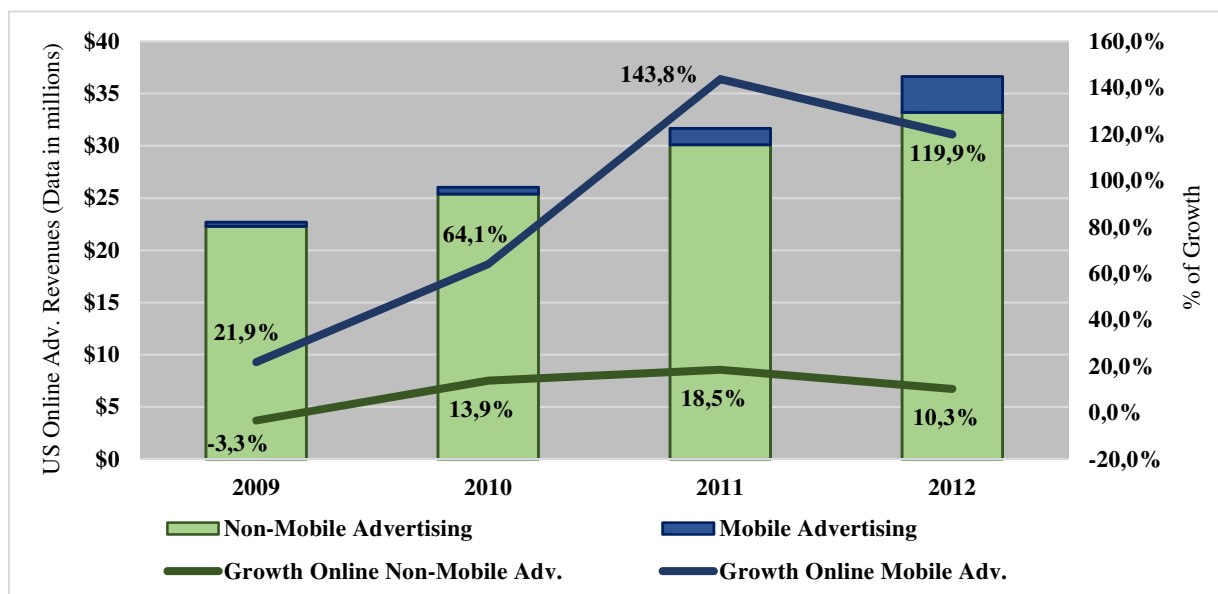


Figure 20 – US Online Advertising Revenue divided by Mobile and Non-Mobile Adv., in the period 2009-2012. (Source: own illustration based on IAB and PwC, 2014).

³⁹ Source: “US Online Advertising Revenues” (IAB and PwC, 2014).

Additionally, Facebook's business was characterized by strong competition. Google, Twitter, LinkedIn, Microsoft and other Internet companies offered services and products similar and in competition with Facebook's ones. Some of these companies had more resources and, above all, a better market position; consequently, Facebook's success depended on its ability to effectively compete by creating attractive products, enhancing user engagement, investing in marketing activities, enlarging user base, building a strong brand and monitoring competitors. In 2011, Facebook was the most used social network worldwide, but Twitter was becoming increasingly widespread and Google+ had just been launched. Additionally, there were new social networks (for example, Instagram and Snapchat which were launched, respectively, in 2010 and 2011) that offered new options and functions to their users and that rapidly started to acquire and engage users at the expense of the growth of the other social networks. In order to continue its growth strategy, Facebook intended "to make acquisitions to add specialized employees, complementary companies, products, or technologies" (Facebook's Registration Statement, February 2012, p.25); for this purpose, Facebook acquired Instagram in the first half of 2012.

The company was also exposed to actions made by governments to restrict the access to Facebook in their countries and influenced by U.S. and foreign laws and regulations regarding privacy and data protection. For example, in 2011, the access to Facebook was forbidden in China, North Korea, Iran and Syria. If several other countries had started to restrict the access to Facebook, the company would have not been able to maintain its growth forecasts.

Finally, the business was also influenced by the development of new technologies to which Facebook had to rapidly adapt. Indeed, Facebook's mobile products and app depended upon effective operation with smartphone operating system. Moreover, Facebook needed also to control the impact of new programs and technologies that were created to block, obscure or eliminate the display of any ads and commercial contents in the social network's desktop website and mobile app.

Ownership Structure and the Rise of Facebook Valuation before the IPO

As reported in the section "Principal and Selling Stockholders" of the IPO prospectus, before the initial public offering the CEO and Facebook founder, Mark Zuckerberg, held 28.4% of Class B shares, which granted ten times the voting power of Class A shares. Although Zuckerberg had only 28.2% of total Facebook shares, he controlled the majority of voting rights

thanks to the voting agreements that he had established with other important shareholders who had ceded their voting rights to him. These “shares subject to voting proxy” gave him another 30.6% of the voting rights: this permitted Zuckerberg to possess the 56.9% of total voting power. The other executive officers and directors, considered as a group, owned the 12.9% of Class B shares; among them, only Peter Thiel (the first angel investor that invested in Facebook) had more than 1% of Class B shares and voting rights (he owned the 2.5% of Class B shares).

The American venture capital firm, Accel Partners, had invested in Facebook in the first half of 2005 and was the first venture capital investor in the company. Accel Partners, together with James W. Breyer (the managing partner that in 2011 was still in Facebook’s board of directors), had 11.4% of Class B shares and the same percentage of voting rights. Another investment company, Digital Sky Technologies (DST) Global, owned the 31.4% of Class A shares and the 5.4% of Class B shares (with a total 5.5% of voting rights). Goldman Sachs (and entities affiliated with Goldman Sachs) had 56.3% of Class A shares but less than 1% of voting power, while T. Rowe Price (another global investment management firm) had 5.2% of Class A shares and 0.6% of Class B shares.

Finally, one of the co-founders of Facebook, Dustin Moskovitz, who left the company in 2008, had 7.6% of Class B shares before the IPO. The other co-founders, who left the company or were liquidated by Zuckerberg, held smaller percentage of shares at the end of 2011. The remaining shares and voting powers were divided by several venture capital firms and smaller angel investors. In Table 17, it is summarized the ownership structure of Facebook before the company went public, while in Figure 21 it is reported the percentage of voting rights. From the graph (Figure 21), it is possible to observe that the CEO, Mark Zuckerberg, controlled the majority of Facebook’s voting rights (56.9%).

<i>Executive Officers and Directors</i>		<i>Investors</i>		
Name of Owner	Class B	Name of Owner	Class A	Class B
Mark Zuckerberg	28.4%	Accel Partners	-	11.4%
Shares Subject to voting proxy	30.6%	DST Global	31.4%	5.4%
Total Mark Zuckerberg	57.1%	Goldman Sachs	56.3%	-
Peter A. Thiel	2.5%	T. Rowe	5.2%	0.6%
Other Ex. Officers and Directors	10.4%	Dustin Moskovitz	-	7.6%
Total (excluding Zuckerberg)	12.9%	Other Investors	7.1%	5%
Total	70%	Total	100%	30%

Table 17 – Facebook’s Ownership Structure before the IPO. (Source: own illustration based on Facebook’s Registration Statement, February 2012)

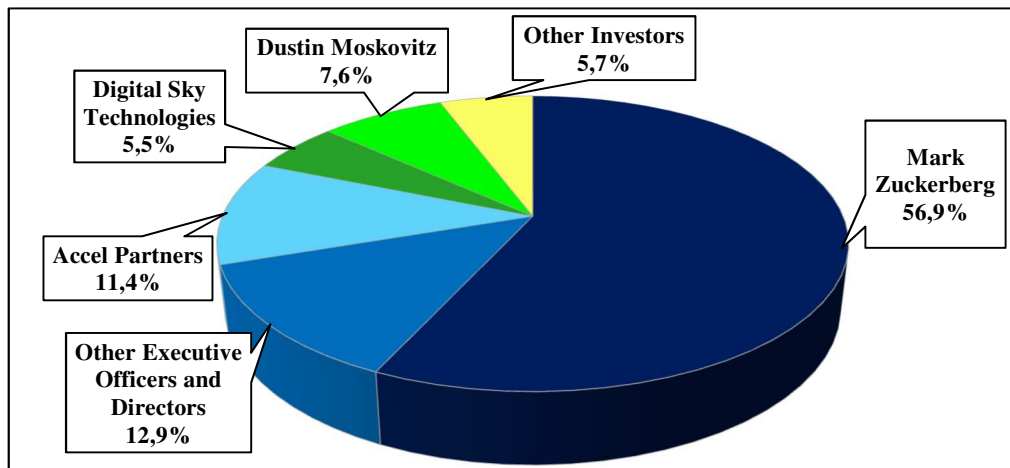


Figure 21 – Percentage of Voting Rights before the IPO. (Source: own illustration based on Facebook's Registration Statement, February 2012)

From the birth of Facebook in 2004 to the end of 2011, the company received several financings from angel investors and venture capital firms. Venture capital firms' investments in Facebook were based on their own valuations of the company that drastically increased in the years before the IPO. The first angel investor, Peter Thiel, invested \$0.5 million at the end of 2004 for 10.2% of equity stake, giving an implicit valuation of Facebook of about \$5 million. In 2005, Accel Partners invested \$12.7 million and valued the company \$100 million; while in 2007, Microsoft invested \$240 million for the 1.6% of equity stake. In 2009, Digital Sky Technologies (DST) valued the company \$10 billion and invested \$200 million for the 2% of equity stake. Finally, in 2011, Goldman Sachs valued the company at \$50 billion and invested, together with DST Technologies, \$500 million. Table 18 shows the principal financings received from 2004 to 2011, with the associated valuation made by investors at the time of their investments in the company. From Table 18, it is possible to observe both the growth of Facebook's valuation and the growth of the amounts invested by angel investors and venture capital firms since the company's incorporation date to the year before the IPO.

<i>Year of Investment</i>	<i>Investors</i>	<i>Amount Invested</i>	<i>Facebook Valuation</i>
2004	Peter Thiel	\$0.5 million	\$5 million
2005	Accel Partners	\$12.7 million	\$100 million
2006	Greylock Partners, Meritech Capital	\$27.5 million	\$500 million
2007	Microsoft	\$240 million	\$15 billion
2009	DST	\$200 million	\$10 billion
2010	Elevation Partners	\$120 million	\$23 billion
2011	Goldman Sachs, DST	\$500 million	\$50 billion

Table 18 – Amount Invested by Angel Investors and Venture Capital Firms from 2004 to 2011, and their Associated Facebook Valuation. (Source: own illustration based on "Tracking Facebook's Valuation", DealBook - New York Times, February 2012)

4.3 - THE FACEBOOK IPO PROCESS

Facebook announced its IPO on February 1, 2012 by filing Form S-1 Registration Statement with SEC. The initial public offering was scheduled for May 2012 and it was initially expected to raise \$5 billion for the company. The announcement of the IPO was awaited by financial community; indeed, Facebook was approaching the maximum number of shareholders that a private company could have without the duty of public disclosure: companies with a number of shareholders exceeding 500, were required to register under the Securities Exchange Act of 1934 and comply with reporting requirement. So, Facebook needed to conform to public company disclosure rules, but it was not required to list its shares and go public; nevertheless, since it would have become subject to much of the regulation of public companies, Facebook decided to launch the IPO at the beginning of 2012 and get the full benefits of being public.

Facebook's IPO was one of the largest IPOs of all time and was considered "by many investors the greatest deal after Google's Listing" (Cervellati, Di Sandro and Piras, 2013, p.6). The company led by Zuckerberg went public in a period characterized by several successful internet-related IPOs and considered by some authors an "hot issue market": LinkedIn and Yandex N.V. went public a year before Facebook and gained, respectively, more than 100% and more than 55% on their first day of trading, Groupon went public in November 2011 and registered an underpricing of more than 30%, Zynga went public in December 2011 and, although its first day closing price was below the offer price, its shares gained about 50% in the first ten weeks; Millennial Media and Youku.com went public few weeks before Facebook and gained respectively more than 90% and more than 110% on their first day of trading. Additionally, as it has been observed in Chapter 3⁴⁰, considering the period from 2000 to 2013, the years 2010-2013 were characterized by the second highest average level of underpricing for internet-related IPOs (31.65%), after the one of "Dot-com bubble" years (2000-2001).

The launch of Facebook IPO was perceived with great enthusiasm by investors and there was a strong demand for Facebook stocks during pre-IPO marketing activities. During the road show, which started on May 7 in Manhattan, the demand became increasingly higher: the IPO was oversubscribed, and the company decided to increase the number of shares offered few days before the offering⁴¹. Although the real value of the company was difficult to be evaluated, most investors believed that Facebook's shares represented a good investment, given the numbers that the social network had been able to reach in only seven years from its launch.

⁴⁰ See "Descriptive Analysis" (Chapter 3).

⁴¹ See next paragraph "*Underwriters, Price Determination and Shares Offered*".

Underwriters, Price determination and Shares Offered

Given its dimension, Facebook IPO had several underwriters; the most important were: Morgan Stanley, J.P. Morgan, Goldman Sachs, Bank of America – Merrill Lynch, Barclays Capital and Allen & Company. The lead underwriter chosen by the company was Morgan Stanley, which had already led some of the biggest tech and internet-related IPOs concluded in previous years, like Google (2004), Zynga (2011) and LinkedIn (2011)⁴².

The initial price range for Facebook shares, conveyed at the beginning of the road show, was \$28 - \$35, which implied a valuation of the company in the range of \$77 billion to \$96 billion. On May 15, three days before the listing, given the strong demand for Facebook shares, the company decided to increase the price range to \$34 - \$38. According to the preliminary prospectus, Facebook planned to sell more than 337 million of shares. The company had a dual-class stock structure and shares offered were only Class A shares; it was stated that CEO Zuckerberg, after the IPO, would have retained the 22% of total shares but the control of more than 55% of the voting power. After the increase of the price range, Facebook decided to also increase the number of shares offered by 84 million shares (25% more compared to the shares offered originally proposed). The increase came from the shares offered by the selling stockholders: in the final prospectus it was specified that Facebook Inc. was offering 180 million of Class A shares, while the selling stockholders were offering 241 million of their Class A shares (the 57% of the total 421 million shares offered, as shown in Figure 22).

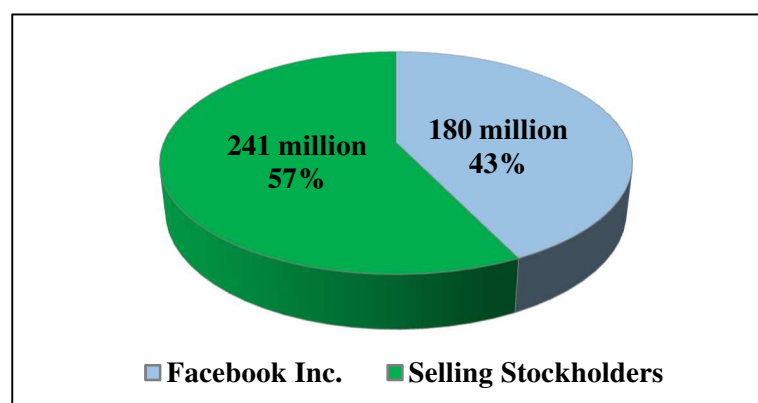


Figure 22 – Shares offered in Facebook's IPO by the Company and by the Selling Stockholders. (Source: own illustration based on Facebook's Registration Statement, February 2012)

On May 17, the day before the IPO, the price was set at \$38 at the top of the proposed price range. This meant that, with all the 421 million of shares sold, the IPO raised about \$16 billion and valued the company at approximately \$104 billion. In 2004, Google's IPO, which was the

⁴² As it has been examined in Chapter 3 ("Descriptive Analysis"), Facebook's IPO was marketed by the most prestigious and reputed underwriters, like all the other biggest IPOs of the period analysed.

largest internet-IPO of the period 2000-2011 (before Facebook’s IPO)⁴³, raised less than \$1.7 billion and valued the company (Google Inc.) about \$26 billion. As affirmed by Rusli and Eavis (2012), Facebook’s market value (at \$104 billion) was higher than those of McDonald’s, Citigroup and Amazon.

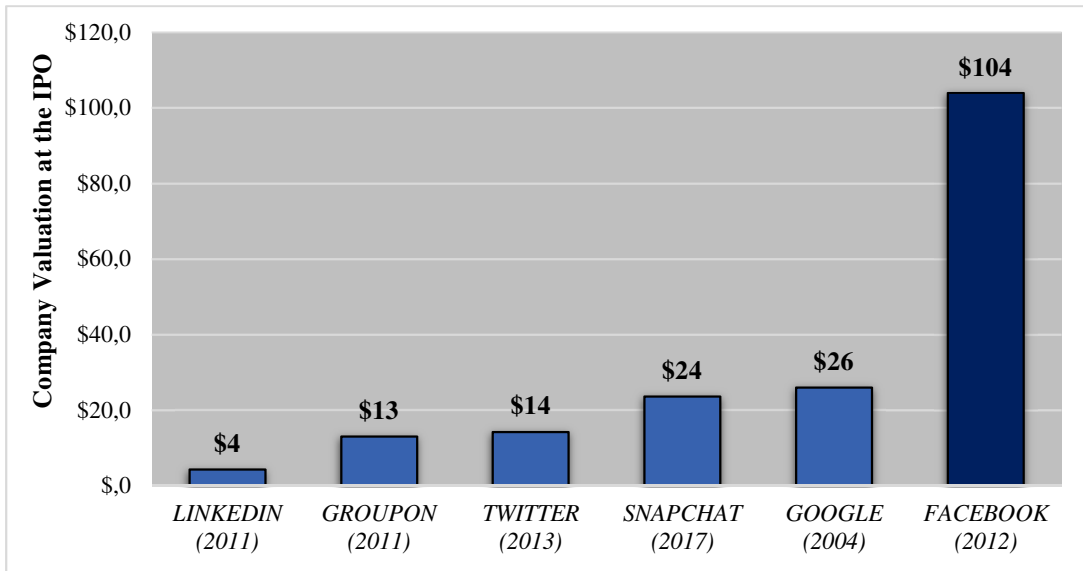


Figure 23 – Company Valuation at IPO. Data in billions of US Dollars. (Source: own illustration based on: CB Insights, 2017 and Statista, 2016)

From Figure 23, it is possible to observe Facebook’s valuation (at the IPO) in comparison with the valuations (at the IPO) of some of the most important internet-related companies that went public in the period 2000-2013, and with the valuations (at the IPO) of Facebook’s most important competitors: Google, Twitter, Groupon are the internet firms with the highest market capitalization (after Facebook) in the period 2000-2013; while LinkedIn and Snapchat are Facebook’s competitors since they are social network companies. Particularly, it is interesting to see how Facebook was valued at the IPO in relation with the other social networks’ valuations: Facebook’s valuation was more than four times higher than Snapchat’s one, more than seven times Twitter’s one and approximately twenty-five times higher than LinkedIn’s one.

The Last Days Before the IPO and the Debut on the Stock Market

At the end of April, Facebook communicated its results for the first quarter of the year 2012: Facebook’s revenue had considerably grown compared to the first quarter of 2011 (+44,7%) but had decreased of 6,5% compared to the fourth quarter of 2011 and profit had fallen of 12%

⁴³ As reported in the paragraph “Descriptive Analysis” (Chapter 3).

due to higher expenses incurred (+97,4%)⁴⁴. The company reported in the prospectus that costs and expenses would have continued to grow and that there was the risk that costs could grow more quickly than their revenue in the future. These results were not considered an alarming signal by investors (above all by retail investors) because the company continued to grow at high rates, advertising revenue were driven by seasonal trends and the increased costs were also associated with marketing expenses related to the IPO.

Monthly active users continued to increase and at the end of March MAUs were more than 900 million. Nevertheless, on May 9, Facebook filed Amendment No. 6 to the Registration Statement, in which the company reported that worldwide MAUs were increasing above all thanks to the strong growth of mobile MAUs, that increased by 69% in the first quarter of 2012 (from 288 million as of March 31, 2011 to 488 million as of March 31, 2012). The company reported also that an important number of users (approximately 83 million) accessed the social network solely through mobile apps or the mobile website and that this number was expected to increase steadily. Facebook had never shown ads in its mobile website and mobile apps; so, the company expressed its concern about the fact that users (MAUs and DAUs) were increasing more rapidly than the increase in the number of ads delivered and that, consequently, the average revenue per user (ARPU) was decreasing. The problem related with Facebook's unproved ability to generate revenue from mobile products and the negative impact that increasing mobile-only users were having on advertising revenue, were communicated only few days before the IPO and after the beginning of the road show. In addition, on May 15 (only three days before the IPO), as reported by Terlep, Vranica and Raice (2012) and described by Lee (2014), General Motors, considered one of the largest advertisers in U.S., communicated that it would stop paid advertising on Facebook, after having already invested more than \$10 million, because Facebook paid ads did not have a big impact on consumers' purchases.

Considering Facebook's problems with its mobile business and the company's not exciting first quarter results, the lead underwriter Morgan Stanley and analysts at J.P. Morgan, Goldman Sachs and Bank of America reduced Facebook's revenue and earnings estimates few days before the issue. As stated by Doring (2013, p.47), "such a change in a company's revenue forecasts by an underwriter so close to the IPO was unprecedented". Morgan Stanley and the other investment banks did not disclose their new forecasts during the road show, but advised only select institutional investors. Retail investors were not informed of the lowered estimates and, few days after the listing, when information became public, Morgan Stanley was accused of selective disclosure. Indeed, the lead underwriter, that had cut Facebook's revenue growth rates,

⁴⁴ See Appendix B ("Quarterly Consolidated Income Statement").

informed only its “best” institutional clients and did not make public this information because it would have led to a decrease in the offer price and probably to a strong decrease in the demand of Facebook’s shares, causing the failure of the IPO.

On May 17, there was Facebook’s IPO pricing committee. There was a conference call between Facebook’s CFO David Ebersman, other member of Facebook’s board and Morgan Stanley representatives. They had to decide the IPO final price and, as described by Diamond (2012), the CEO of Morgan Stanley (James Gorman) was also present on this call. Gorman’s presence on a pricing call was highly unusual: “the most plausible reason for his joining the call is that bankers handling the transaction needed him to help push back against the CFO and the Facebook board because of a disagreement over the price of the IPO” (Diamond, 2012, p.12). Indeed, while Facebook tried to even increase IPO price above \$40, the investment banks wanted to lower the price since they knew the risks related with overpricing the IPO. The lead underwriter communicated that institutional investors were not willing to pay a price higher than the range \$34-\$38 previously communicated and, finally, the price was set at \$38.

On May 18, U.S. stock market opened regularly at 9:30am. The debut of Facebook was expected at 11:00am, but shares trading did not start until 11:30am, due to NASDAQ’s software problems. During the first 30 minutes, the volume of buy and sell orders was extremely high (about 80 million of shares were sold in the first 30 seconds). NASDAQ’s software was overwhelmed: “investors were unsure of which stock price was being matched with their orders because of the delays and software problems” (Doring, 2013, p.48). The stock opened at \$42, but then came back down and closed the first day of trading at \$38.23. The closing price stayed above the offer price thanks to underwriters’ intervention: they started to buy back shares to support stock price. Price support continued in the following days, but this did not prevent the price from falling: in three days of trading the stock lost 18% of its value. After ten days of trading, Facebook’s stock price was almost 30% below the offer price. At the end of August, three months after the IPO, stock reached its lowest price at \$18, more than 50% below its \$38 IPO price. This meant that, in just three months of listing, the company lost about \$50 billion of its market capitalization.

Several different lawsuits and class actions were filed against Facebook, its CEO Zuckerberg, the underwriters and NASDAQ. Facebook and Morgan Stanley were accused of selective disclosure of material information, but lawsuits were unsuccessful because the company demonstrated that all the information and warnings regarding the trend of MAUs, the problems with Facebook’s mobile business and the increase in costs and expenses, were included both in the preliminary and in the final prospectus. Moreover, Facebook and Morgan Stanley did not

have a duty to disclose specific revenue and earnings forecasts. “It appeared that all relevant information was available to the market. It would therefore be difficult for the plaintiffs to demonstrate that the stock price was inaccurate when taking into account all of the information available to investors at the stock opening” (Doring, 2013, p.64). Finally, NASDAQ settled its lawsuit⁴⁵ and agreed to pay \$26.5 million to compensate investors who realized profit losses due to technological problems of the software.

4.4 - THE VALUATION OF FACEBOOK

The real value of Facebook was difficult to be evaluated at the time of the IPO. As it has been reported in the previous paragraphs, the final offer price (\$38) set the company’s valuation at approximately \$104 billion: a really high value, considering that this was the highest IPO valuation among internet companies in the history⁴⁶. Nevertheless, Facebook’s stock realized a strong negative performance in the first months after the stock market debut and the company lost about \$50 billion of its market capitalization in just three months of listing. Was the company overvalued at IPO price?

To analyse whether Facebook was overvalued at the IPO, I decided to provide an evaluation of the company using Discounted Cash Flow (DCF) methodology. I started examining the income data and the financial information reported in Facebook’s Registration Statement, which are summarized in Table 19.

Revenue	\$3.71 billion in 2011 (\$1.97 billion in 2010)
Revenue Growth	+88% in 2011 (+154% in 2010)
EBIT Margin	46% in 2011 (51% in 2010)
Tax Rate	41% in 2011 (40% in 2010)
Cash	\$1.51 billion at the end of 2011
Debt	\$1.14 billion at the end of 2011 ⁴⁷
Preferred Stocks	\$615 million at the end of 2011

*Table 19 - Summary of Financial Statement Data for DCF Valuation Model
(Source: own illustration based on Facebook’s Registration Statement, February 2012)*

⁴⁵ Plaintiffs “alleged that NASDAQ made material misrepresentations and omissions regarding the capabilities of its technology to be able to handle the massive volume involved in launching the Facebook IPO” (Pustorino, 2015, p.133).

⁴⁶ Today, the highest IPO valuation belongs to Alibaba (around \$167 billion) and Facebook has the second highest IPO valuation among internet companies. (Source: Statista, 2017)

⁴⁷ I calculated the value of the debt at the end of 2011, as the sum of 398 million of capital lease (reported in the 2011 balance sheet) and the discounted operating lease that amounted to 749 million.

In the DCF analysis, it has been used an explicit forecast period of 10 years; Facebook's value beyond the explicit forecast period is estimated through the terminal value formula. Facebook's Registration Statement did not report any specific revenue and earnings forecasts and, so I assumed that Facebook's revenue growth rates and profitability would have been similar to Google's ones in the years after its IPO. This is a strong assumption, but it is based on different reasons: first of all, both Google and Facebook are internet companies and, specifically, are the biggest internet companies (considering firms' market capitalization) that went public in the period 2000-2013. Both companies generate most of their revenues from the online advertising and they also had similar level of revenues at the time of their IPO (Facebook's revenues were \$3.71 billion, while Google's ones were \$3.14 billion). Moreover, the age of the companies at their IPO was similar (Google was 6 years old while Facebook 8 years old) and, also their revenue growth paths before the IPO were fairly in line. Assuming that Facebook's growth could resemble to Google's one is an optimistic scenario; indeed, Google grew steadily at high rates in the ten years after its IPO and became the world's leading search engine and, particularly, the leader of the online advertising market.

After having analysed Google's revenue growth rates and profitability, I made the following assumptions to perform Facebook's DCF valuation:

- Revenue Growth: extremely high growth rates in the first years, that steadily decrease during all the explicit forecast period. In the analysis I used an annual average growth of approximately 50% for the first 5 years (2012-2016) and of approximately 20% from year 6 to year 10 (2017-2021). Facebook's revenue growth rates are based on Google's average growth rates in the years 2005-2009 and 2010-2014 (the years after Google's IPO).
- EBIT margin: Facebook's EBIT margin was 51% in 2010 and 46% in 2011. During the explicit forecast period, I assumed that EBIT margin decreases steadily because, as stated in Facebook's Registration Statement, costs are expected to increase both in the dollar amount and as a percentage of revenue to support the company's growth. At the end of the forecast period, EBIT margin is stable at 30% of revenue, which is the average Google's EBIT margin in the long period.
- Sales to Capital Ratio (Reinvestments): to calculate the reinvestments needed each year to sustain the projected revenue growth, I used the Sales to Capital ratio (as made by A. Damodaran, in his Facebook's valuation⁴⁸). I assumed that Facebook maintains the

⁴⁸ Damodaran (2017), p.188.

same average Sale to Capital ratio of Google in the first 5 years (0.95⁴⁹), and that, from year 6, Facebook's Sales to Capital ratio is equal to the mean Sales to Capital ratio of internet sector (1.3⁵⁰).

- Tax Rate: Facebook's Tax rate in 2011 was 41%. In the analysis, I used the same Tax Rate both in the explicit forecast period and in the terminal year.
- Cost of Capital: I used the average cost of capital of the American advertising and internet companies. For the first 5 years, I used a cost of capital of 9.90%, which is calculated as the mean of the cost of capital for US companies in the advertising sector and in the internet sector in 2011. From year 6, I used a cost of capital of 8.27%, which is calculated as the mean of the cost of capital for US companies in the advertising sector and in the internet sector in 2016⁵¹.
- Final Growth Rate: as made by A. Damodaran (2017) in his Facebook's valuation, I assumed a Final Growth rate of 2% that is also, as stated by Damodaran (2017), the most used Final Growth rate in DCF analysis.

As it is possible to observe from the results reported in Figure 24 (page 85), I obtained an estimated value per shares of \$27.94, that is about \$10 lower than the IPO offer price. The value of equity calculated using the DCF valuation is \$76.5 billion, more than 26% lower than the valuation of \$104 billion set by the IPO final price. Considering these results and the fact that the analysis was based on an optimistic scenario, Facebook was overvalued at the time of the IPO and its valuation was not justified by its fundamentals.

Nevertheless, as it is possible to observe from the sensitivity analysis⁵², the value per share obtained is highly sensitive to changes in "Final Growth Rate" and "Cost of Capital". With a "Final Growth Rate" of 3% (instead of 2%), maintaining all other assumptions unchanged, the value per share increases to \$33.15; while with a "Final Growth Rate" of 1% the value per share decreases to \$24.16. Table 23 (in Appendix C) shows that, using the average cost of capital for firms in the advertising sector and maintaining all other assumptions unchanged, the value per share increases to \$38.64; while using the average cost of capital for firms in the internet sector, the value per share decreases to \$21.81. Finally, it is possible to note from Table 24 (in Appendix C) that value per share is also highly sensitive to changes in "EBIT Margin"; with an EBIT Margin of 40% (in Terminal Year), the value per share increases to \$39.49, while with

⁴⁹ Source: own calculation based on Google's Financial Statements of the years 2005, 2006, 2007, 2008, 2009.

⁵⁰ Source: own calculation based on Damodaran Data ("Sales to Capital Ratios by Industry") of the year 2011, 2012, 2013, 2014, 2015, 2016. Available at: <http://pages.stern.nyu.edu/~adamodar/> [Accessed 12 November 2017]

⁵¹ The average cost of capital of US Advertising and Internet Sector are taken from Damodaran Data. "Cost of Capital by Industry" available at: <http://pages.stern.nyu.edu/~adamodar/> [Accessed 12 November 2017]

⁵² See Appendix C.

an EBIT Margin of 20% the value decreases to \$16.39. Table 24 (Appendix C) also shows that the value per share is only moderately sensitive to the changes in “Sales to Capital Ratio”.

To verify if revenue growth rates used in the explicit forecast period are plausible, I compared (ex post) the Facebook’s 2016 total revenue with the 2016 estimated revenue calculated in the DCF valuation. I observed that Facebook’s 2016 total revenue (\$27.64 billion⁵³) and the 2016 estimated revenue based on DCF revenue projections (\$29.83 billion) are similar, and so that revenue growth rates used in the explicit forecast period can be considered plausible.

Additionally, also comparing Facebook’s multiples with Google’s ones, and with the average multiples of US companies in the Internet and in the Advertising sector, it is possible to concluded that Facebook was overvalued. Indeed, as shown in Table 20, Facebook had a Price-Earnings ratio extremely high (104.16), that was almost five times higher Google’s P/E, almost three times higher the average P/E ratio of companies in the Internet sector, and almost nine times higher the average P/E ratio of companies in the Advertising sector. Considering Price to Sales ratio, the difference was even bigger between Facebook (28.07) and Google (4.61). Finally, Facebook had an EV/EBIT and an EV/EBITDA which were more than three times higher Google’s ones and almost double with respect to Internet sector.

	P/E	P/Sales	EV/EBIT	EV/EBITDA
Facebook⁵⁴	104.16	28.07	45.24	38.21
Google⁵⁵	21.65	4.61	14.84	12.05
Internet Sector⁵⁶	36.16	4.60	21.41	17.06
Advertising Sector⁵⁷	12.38	1.00	11.09	7.90

Table 20 – P/E, P/Sales, EV/EBIT and EV/EBITDA Multiples in the year 2012. (Source: own illustration)

⁵³ Source: Facebook’s 2016 Income Statement.

⁵⁴ Facebook’s multiples are calculated at the time of the IPO, using the final offer price (\$38).

⁵⁵ Source: Bloomberg.

⁵⁶ Source: Damodaran “Multiples by Industry Sector”.

⁵⁷ Source: Damodaran “Multiples by Industry Sector”.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Terminal Year
Revenue Growth		65%	60%	50%	45%	40%	35%	25%	20%	15%	10%	5%
Revenue	3.711	6.123	9.797	14.696	21.309	29.832	40.273	50.341	60.410	69.471	76.418	80.239
EBIT (Margin)	46%	42%	40%	38%	38%	36%	34%	32%	30%	30%	30%	30%
EBIT		2.572	3.919	5.584	8.097	10.740	13.693	16.109	18.123	20.841	22.926	24.072
Tax Rate	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%	41%
EBIT(1-Tax Rate)		1.517	2.312	3.295	4.777	6.336	8.079	9.504	10.693	12.296	13.526	14.202
Sales to capital ratio		0,95					1,3					
Reinvestments		2.539	3.867	5.156	6.961	8.972	8.032	7.745	7.745	6.970	5.344	2.939
FCF		-1.022	-1.555	-1.862	-2.184	-2.636	47	1.760	2.948	5.326	8.182	11.263
Cost of Capital*		9,90%	9,90%	9,90%	9,90%	9,90%	8,27%	8,27%	8,27%	8,27%	8,27%	8,27%
PV (FCF)		-930	-1.288	-1.403	-1.497	-1.644	27	937	1.449	2.418	3.431	

Final Growth Rate	2%
Terminal Value	179.636
PV (Terminal Value)	75.329
NPV	76.829
Cash	1.512
Debt	1.147
Preferred Stock	615
Value of Equity	76.579
N° of Shares	2.741

*Cost Of Capital	2011	2017
Advertising Sector	11,42%	6,57%
Internet Sector	8,37%	9,97%
Facebook	9,90%	8,27%

Value per share	\$27,94
IPO Final Price	\$38,00

SENSITIVITY ANALYSIS						
Cost of Capital		Final Growth Rate				
0-5 years	6-10 years	1%	1.5%	2%	2.5%	3%
8,90%	7,27%	\$30,77	\$33,38	\$36,49	\$40,24	\$44,88
9,40%	7,77%	\$27,19	\$29,31	\$31,81	\$34,77	\$38,36
9,90%	8,27%	\$24,16	\$25,91	\$27,94	\$30,32	\$33,15
10,40%	8,77%	\$21,55	\$23,01	\$24,68	\$26,62	\$28,89
10,90%	9,27%	\$19,30	\$20,53	\$21,92	\$23,52	\$25,37

Numbers highlighted by light blue color are based on my assumptions

Figure 24 – Facebook: DCF Valuation (Source: own illustration).

4.5 - THE REASONS BEHIND THE “FAILURE” OF THE IPO

In the previous paragraphs, it has been described the Facebook’s IPO process, the company’s performance and situation before the IPO, and the stock market debut; additionally, it has been reported the valuation of Facebook (at the time of the IPO) performed using DCF methodology. In the last part of this chapter, it is analysed the reasons of the failure of the IPO and the causes of the short-term negative stock performance.

The first reason is related to the valuation of the company. At the IPO price, Facebook’s was overvalued. The market value of more than \$100 billion was extremely high if compared with Google’s market value. At the time of Facebook’s IPO, Google’s market capitalization was just over \$200 billion, but its 2011 revenue were \$37.9 billion, its net income was almost \$10 billion, and, above all, Google’s revenues were steadily increasing at high growth rates (at the end of 2012, Google’s revenues were more than \$50 billion and net income was almost \$11 billion). If these results are compared to Facebook’s one (revenue were \$3.7 billion in 2011 and net income was \$1 billion⁵⁸), it is easy to understand that Facebook was overvalued based on fundamentals. This is confirmed by the fact that Facebook’s shares at the IPO price were trading at about 100 times their earnings per share⁵⁹: the company’s P/E ratio was almost five times higher than Google’s P/E⁶⁰. Young internet-related and high-tech companies are difficult to be evaluated, but Facebook’s valuations could be justified only by revenue growth rates almost impossible to achieve. In DCF analysis, to estimate Facebook’s future revenues, I used the same revenue growth path realized by Google in the ten years after its IPO (so, I assumed that Facebook would have reached revenue levels similar to the ones of Google, that was the leader of the online advertising market) and I obtained a value of equity that was more than 26% lower than Facebook’s market capitalization at the IPO.

In 2012, Facebook was growing faster the Google and in the three years before the IPO the company had astonishing growth rates (revenue increased of about 185%, 154% and 88% respectively in 2009, 2010 and 2011); nevertheless, it was difficult to foresee similar growth rates in the long term, considering that the revenue growth was already slowing down (as it is possible to observe from Figure 25) and considering the problems that Facebook was facing with its mobile business. Moreover, Facebook’s ARPU (average revenue per user) was still low: as reported in Facebook’s “First Quarter 2012 Financial Results”, ARPU was just \$1.21 in the first quarter of 2012, while LinkedIn and Google had an ARPU respectively of \$1.76 and

⁵⁸ See the paragraph “Facebook Financial Results”.

⁵⁹ Facebook’s Price-Earnings ratio at the IPO stock price was around 104.

⁶⁰ See the paragraph “The valuation of Facebook”.

\$7.14 in the same period⁶¹. Additionally, as reported by the prospectus, also costs and expenses were increasing rapidly and there was the risk that they increased more quickly than revenue. Finally, monthly and daily active user quarterly growth rates were always positive but decreasing significantly from quarter to quarter and sustained above all by mobile user growth (as shown in Figure 26); moreover, the most important growth opportunities for the social network came from the entrance in new countries where Facebook was exposed to the actions made by governments to restrict its access. Figure 25 and Figure 26 show, respectively, the trend in quarterly revenue growth and the growth trend of monthly, daily and mobile active user: it is possible to note that growth rates were rapidly slowing down from quarter to quarter.

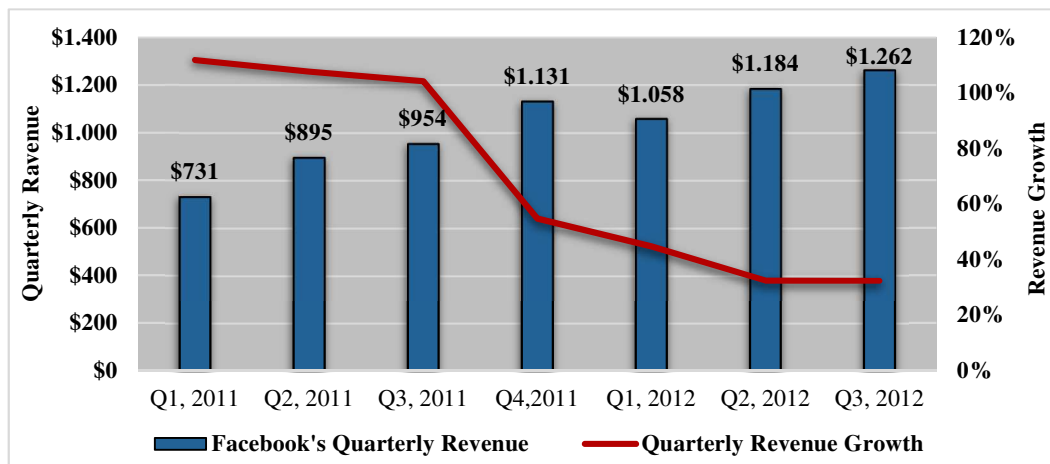


Figure 25 - Facebook's Quarterly Revenue and Quarterly Revenue Growth.
(Source: own illustration based on Facebook's 2011 and 2012 Financial Statements)

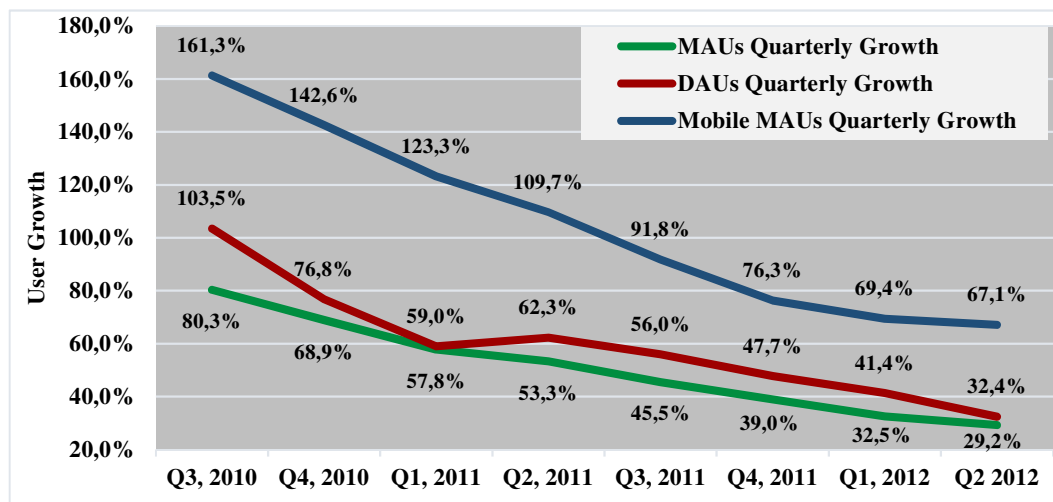


Figure 26 - Facebook's Monthly and Daily Active User Quarterly Growth.
(Source: own illustration based on Facebook's 2011 and 2012 Financial Statements)

The overvaluation of Facebook's stocks at the time of the IPO must be analysed also in relation with the number of shares sold by Facebook's insider and selling stockholders. About 57% of the total shares offered in the IPO came from the company's insider, who sold more than 241

⁶¹ ARPU Data are taken from Comscore, 2011.

million shares. As reported by Diamond (2012), Zuckerberg sold about 30 million shares, Peter Thiel sold almost 17 million shares, Digital Sky Technologies (DST) sold more than 45 million shares and Goldman Sachs more than 24 million. Of the total \$16 billion raised with the IPO, about \$9 billion went to insiders, \$6.7 billion went to the company and almost \$180 million went to the underwriters in fees and commissions. Normally, the percentage of insider sales is much smaller (as it is possible to note from Figure 27) and in many cases pre-IPO investors are even not allowed to cash out their investments during the IPO (for example in Zynga IPO, management and employees could not sell any shares for 165-days after the IPO, due to a lock-up agreement). In the Facebook IPO, key insiders were allowed to sell their shares immediately without any restrictions, and the number of shares offered by them increased significantly few days before the IPO, when Facebook and Morgan Stanley decided to increase the number of shares offered of 25%. As it has been reported in the literature review, Grinblatt and Hwang (1989) showed that IPO initial returns are positively related to the retention rate of pre-IPO owners, and that the decision to retain part of the shares issued is used by firm's managers to signal their optimism about firm's future prospects and value. Consequently, the fact the Facebook's pre-IPO owners were selling a large part of their shares can be interpreted as a signal that they considered Facebook's shares as overvalued.

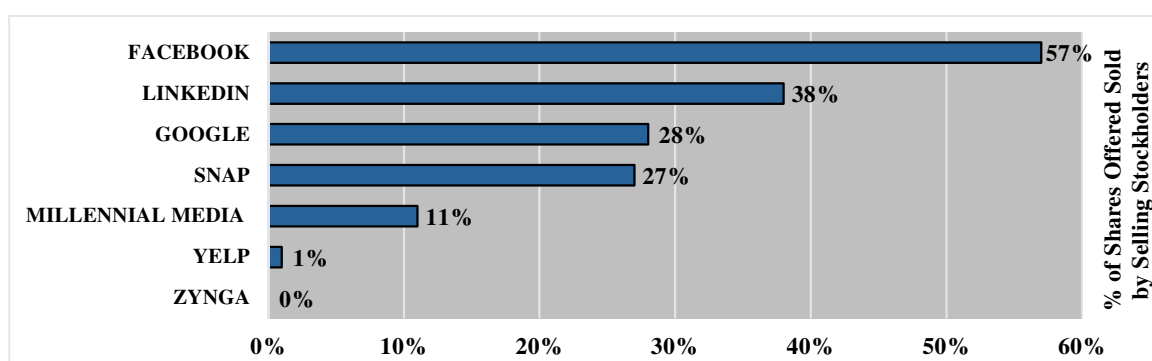


Figure 27 – Percentage of Shares Offered Sold by Selling Stockholders in some Large Internet-Related IPOs. (Source: own illustration based on each companies' Registration Statement)

Shares in an initial public offering are primarily allocated to institutional investors, while retail investors receive between 10% and 15% of the total offerings; for this reason, retail investors usually tend to order more shares because they will receive only a percentage of shares ordered. In Facebook's IPO, retail investors obtained a large portion of total shares: retail investors were the less informed parts about the lowered revenue and earnings estimates and about the negative impact that Facebook's mobile business problems could have on the growth of the company, and given their strong demand, they received 25% of the total 421 million shares offered. That meant that of the total \$16 billion raised, \$4 billion were raised from retail investors: many retail investors, who expected a short-term positive return, given the negative price performance

and the controversies arisen the days after the IPO, decided to sell their shares in the first weeks of trading and reported significant losses. Considering the decision to set the price at the top of the price range (that overvalued the IPO), the decision to increase the shares offered, the high percentage of shares sold by insiders (who used the IPO as an exit strategy) and the percentage of the offering allocated to retail investors, there are grounds for thinking that Facebook's IPO was a "pump-and-dump" scheme: "such a scheme occurs when investors overestimate the initial starting value of a stock through unverified future predictions about the stock, and later, those investors sell the stock once they feel it has peaked" (Roman, 2012, p.490).

With a high IPO final price, Facebook did not leave money on the table and the underwriters gained almost \$180 million in fees and commissions. The spread for underwriters was just 1.1% of the offer price and most of fees and commissions went to the lead underwriter Morgan Stanley. Additionally, the underwriters had also the possibility to increase by 15% the stock supply ("greenshoe option") and, as reported in the Facebook's final prospects, "sell more shares than they are obligated to purchase under the underwriting agreement, creating a short position". The underwriters sold 484 million shares⁶² at \$38 on the first day of trading and, at the same time, they bought 421 million shares from the company and the selling stockholders at \$37.58⁶³. So, Morgan Stanley and the other investment banks had a short position and needed to buy 63 million shares on the open market. The first day of trading, the investment banks started to buy back shares at about \$38 to support stock price. The following days they continued to buy back shares at price below \$38 and closed their short position, making profit from the stock price drop. So, Morgan Stanley decided to sell more shares than the ones initially offered and set the price at the top of the price range, at the same time it cut Facebook's revenue estimates without communicating it to retail investors, and made profit from the stock price drop. According to SEC investigations, this was not a conflict of interest situation since the "greenshoe option" and the possibility to open short positions were included in the prospectus and since Morgan Stanley suffered a reputational damage from this IPO. Nevertheless, this situation created much controversies over the Facebook IPO that fostered stocks sales and the negative price performance in the first months after the listing.

As demonstrated by Cervellati, Di Sandro and Piras (2013) and by Lai and Wu (2014), analysts affiliated with IPO underwriters provided higher pre-IPO valuations of Facebook, favourable coverage and, also, higher target prices after the listing. This was probably due to an implicit agreement between the company and its underwriters according to which analysts affiliated

⁶² About 63 million (15% of 421 million) were sold thank to the "greenshoe option".

⁶³ The offer price (\$38) less the spread (1.1% of the offer price).

with underwriters should have issued favourable coverage. However, it was also because underwriters' analysts faced conflict of interests because some of the investment banks that were underwriting the IPO, at the same time had invested in Facebook and were selling parts of the shares included in the offerings. Goldman Sachs was selling more than 24 million of its shares, that meant that it was monetizing more than 40% of its investment in the company. The lead underwriter itself had important investments in the social-network company and bought private shares of Facebook through its mutual funds few months before the IPO. So, it is clear that underwriters' analysts faced relevant conflict of interests when valuing the IPO and stocks' target price: Lai and Wu (2014) showed that analysts affiliated with the lead underwriters provided more optimistic coverage, while Cervellati, Di Sandro and Piras (2013) demonstrated that underwriters' valuations were higher than other investment banks' valuations and that, as shown in Table 21, Goldman Sachs' target prices were always at least \$5/\$10 above the target prices predicted by Credit Suisse and Bernstein (which were not underwriting the IPO).

	<i>June 2012</i>	<i>October 2012</i>	<i>November 2012</i>	<i>January 2013</i>	<i>February 2013</i>
<i>Goldman Sachs</i>	<i>\$42</i>	<i>\$37</i>	<i>\$35</i>	<i>\$35</i>	<i>\$40</i>
<i>Credit Suisse</i>	<i>\$34</i>	<i>\$24</i>	<i>-</i>	<i>\$31</i>	<i>\$31</i>
<i>Bernstein</i>	<i>\$25</i>	<i>-</i>	<i>\$33</i>	<i>\$33</i>	<i>\$27</i>

Table 21 – Facebook Stock Target Price after the IPO. (Source: own illustration based on Cervellati, Di Sandro and Piras, 2013)

Moreover, the weak stock market debut was caused by problems related to NASDAQ's software. On the day of the listing (Friday, May 18), the stock price did not take off, as was expected by the majority of investors. NASDAQ's software technical problems firstly delayed the listing and then caused a lot of problems to investors that were not able to see whether their orders were correctly executed or not. This situation created lots of confusion and worries among investors and traders. The stock opened around \$42 but rapidly went down and remained above the offer price only thanks to the price support provided by underwriters; it closed slightly above \$38, in line with the offer price, meaning that there was not underpricing. So, the weak stock market debut was caused by problems related to the NASDAQ and not related to Facebook. Nevertheless, the negative stock performance continued the following days of trading, despite NASDAQ's problems had been resolved. Indeed, between Monday, May 21 and Tuesday May 22, Reuters reported the news that Morgan Stanley had cut its revenue and growth estimates for Facebook few days before the listing, and that this information was disclosed only to select institutional investors (selective disclosure). Reuter then added that J.P. Morgan and Goldman Sachs had done the same: they reduced revenue and earnings forecasts, but did not communicate those changes to ordinary investors. Consequently, investors lost

confidence in investing in Facebook's stocks and the investors' enthusiasm around the IPO rapidly waned. Retail investors, who had over-ordered shares, understood that the company was overvalued and started to massively sell, causing the fall of the stock price. For at least the first three months after the listing, Facebook's stock performance was a debacle. As affirmed by Cervellati, Di Sandro and Piras (2013, p.15), "the case of Facebook stresses the importance of regulations and supervision to ensure transparent financial statement and protect investors": in the Facebook IPO case, selective disclosure, lack of transparency and conflicts of interests damaged investors (above all retail investors), provoked the stock price drop and caused reputational damages to the company and to the most important underwriters.

Another element that contributed to reduce investor confidence and that caused the negative debut of Facebook in the stock market was related to the fact that the IPO had not been planned for a specific reason, but the company decided to go public when it was approaching the number of 500 shareholders and was going to become subject to much of the regulation of public companies⁶⁴. The prospectus reported that the principal purpose of the initial public offering was "to create a public market for Class A common stocks" and that the company did "not currently have any specific uses of the net proceeds" raised. As described in previous paragraphs, about 57% of total shares offered in the IPO came from insiders. Considering the initial stock performance and the problems arisen, the IPO was seen as a good exit strategy for the selling stockholder that benefited from the high offer price to liquidate a relevant part of their investments in the company and were able to raise around \$9 billion (of the total \$16 billion raised with the IPO). So, Facebook was asking new investors to invest in the IPO and at the same time the CEO and the board were cashing out part of their investments; this contributed to increase retail investors' worries, who found that Facebook's growth forecasts had been reduced and that insiders were monetizing their investments in the company: such aggressive insider selling was perceived as an alarming signal because, as explained by Draho (2004), insiders generally use their private information to monetize totally or part of their investments at the most opportune moment, when company's valuation is high and near its peak.

Finally, also the dual-class stock structure used by Facebook was another discussed element of its IPO. As it is already described in previous paragraphs⁶⁵, Facebook had a dual-class stock structure (Class A shares and Class B shares) which permitted the CEO Zuckerberg to maintain more than 55% of voting powers after the IPO, thanks to the super-voting powers granted by Class B shares (which were not transferrable, but needed to be converted to Class A shares to

⁶⁴ See the paragraph "The Facebook IPO Process".

⁶⁵ See the paragraph "Underwriters, Price determination and Shares Offered".

be sold) and to the voting agreements that he had with the most important pre-IPO stockholders. This concentrated control of the voting power reduced the ability of the new most important investors (above all institutional investors) to influence the choices of the company and, consequently, as affirmed by Han (2012, p.53), reduced and weakened “incentives for shareholder control”. The less power non-controlling shareholders have, the higher the probability that their interests will not be protected and the higher the risks that controlling shareholders will extract private benefits from their controlling position. Thanks to the dual-class stock structure, Zuckerberg was preserving the control of the voting power while selling part of his shares in the IPO; this contributed to create controversies among investors because they considered Facebook’s dual class structure as a way to disenfranchise future non-controlling shareholders.

After having described and analysed the causes of Facebook’s negative stock market debut, it is possible to conclude that the principal reason behind the failure of the IPO was the company’s overvaluation at the offer price. Nevertheless, this was not the only cause: indeed, the company’s overvaluation at the IPO price must be considered in relation with the massive insider selling that characterized the offering and with the high percentage of shares allocated to retail investors, that were the less informed investors. The overvaluation must be also considered in relation with the conflict of interests that underwriters’ analysts faced when valuing the IPO, since some of the investment banks that were underwriting Facebook’s IPO, at the same time had invested in the company and were selling parts of the shares included in the offerings. Additionally, the fact that the principal underwriters of the IPO cut their Facebook’s revenue and growth estimates few days before the listing, and that this information was disclosed only to select institutional investors, contributed to reduce investors’ confidence in investing in Facebook’s stocks. Other elements that increased controversies and problems among investors and that contributed to the failure of the IPO were related to the dual-class stock structure used by Facebook which permitted the CEO Zuckerberg to control the majority of voting power and which was seen as a way to disenfranchise future non-controlling shareholders. Finally, Facebook’s IPO, as reported in its prospectus, had not been planned for a specific reason but seemed to be only a good exit strategy for the selling stockholders: when retail investors understood that the company was overvalued at the IPO and that pre-IPO stockholders benefited from the high offer price to partially liquidate their investments, they started to massively sell causing a strong negative stock price performance in the first months after the listing.

CHAPTER 5 - CONCLUSION

The aim of this thesis was to investigate internet IPOs in order to analyse the level of their initial returns and find out which are the most important characteristics of internet firms influencing IPO underpricing.

The analysis performed shows that internet IPOs are characterized by high levels of underpricing: US internet-related IPOs conducted in the period from 2000 to 2013 have an average positive initial return of 32.63%. The average levels of initial returns and the volume of internet-related IPOs fluctuate considerably in the analysed years: both the initial return and the volume of IPOs reach their highest levels during the “Dot-com bubble” period (2000-2001) and their lowest levels during the financial crisis of the years 2007-2009.

It has been observed that the level of underpricing is substantially higher for young internet firms and decrease with the increase in firms’ age: firms with less than five years old (approximately 32% of total firms in the sample) are characterized by the highest mean level of initial return (46.28%). Additionally, it has been noted that most internet companies have a market capitalization lower than \$1 billion (approximately 77% of total companies in the sample) but that the companies with the highest market capitalization are generally characterized by the highest levels of underpricing. The analysis also shows the mean ratio of shares offered to total shares outstanding is 26.78% and that internet IPOs with the lowest ratio of shares offered (in other words, with the highest retention rate) have the highest levels of initial returns (it has been observed that there seems to be a negative relation between IPO initial return and the ratio of shares offered). Finally, it is reported that more than 88% of total IPOs of the sample are marketed by the most prestigious and reputed underwriters.

Internet firms with a market capitalization higher than \$10 billion are characterized by an extremely high average initial underpricing (61.29%); nevertheless Facebook, which is the biggest company went public in the years 2000-2013 (considering market capitalization at the time of the IPO), had an IPO first-day return of only 0.61%. I compared Facebook’s IPO with the other largest internet IPOs and with the IPOs of its competitors, and I observed that the principal differences between Facebook and the other companies are related to the level of market capitalization and to the ratio of shares offered in the IPO. From the analysis of Facebook’s IPO case, I concluded that the principal reason behind the failure of the Facebook’s IPO was the company’s overvaluation at the offer price, but this was not the only cause: the massive insider selling that characterized the offering, the high percentage of shares allocated

to retail investors, the conflict of interests that underwriters' analysts faced when valuing the IPO, the dual-class stock structure of the company and the fact that investment banks cut firm's growth forecasts few days before the listing, were all factors that contributed to cause the negative stock price performance of Facebook's shares after the offering.

The limitations of this research are firstly related to the sample used: I analysed almost the whole population of internet IPOs conducted in the period from 2000 to 2013 and listed on NASDAQ and NYSE, but I did not analyse internet IPOs listed outside US on other stock exchanges and IPOs completed in different years (before 2000 or after 2013). The limitations are also related to the type of analysis performed: the descriptive analysis summarizes and quantitatively describes sample data; it is used to highlight potential relations between the variables analysed, but it does not allow us to investigate which variables are significantly related to the level of IPO underpricing.

APPENDICES

APPENDIX A

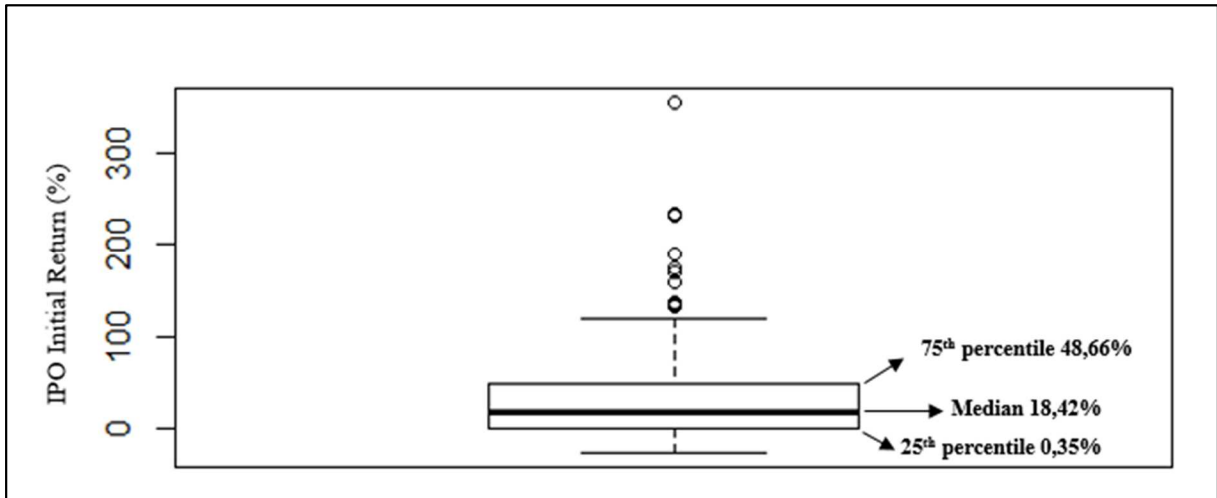


Figure 28 – Box Plot of IPO Initial Return for sample IPOs.
(Source: own illustration based on sample data)

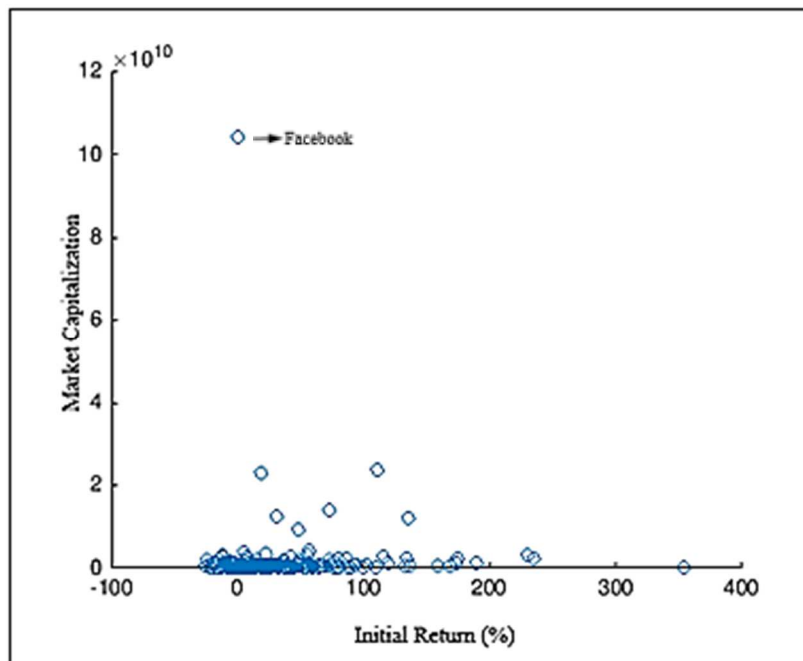


Figure 29 – Scatter Plot which shows Market Capitalization and Initial Return (for all firms in the sample). (Source: own illustration based on sample data)

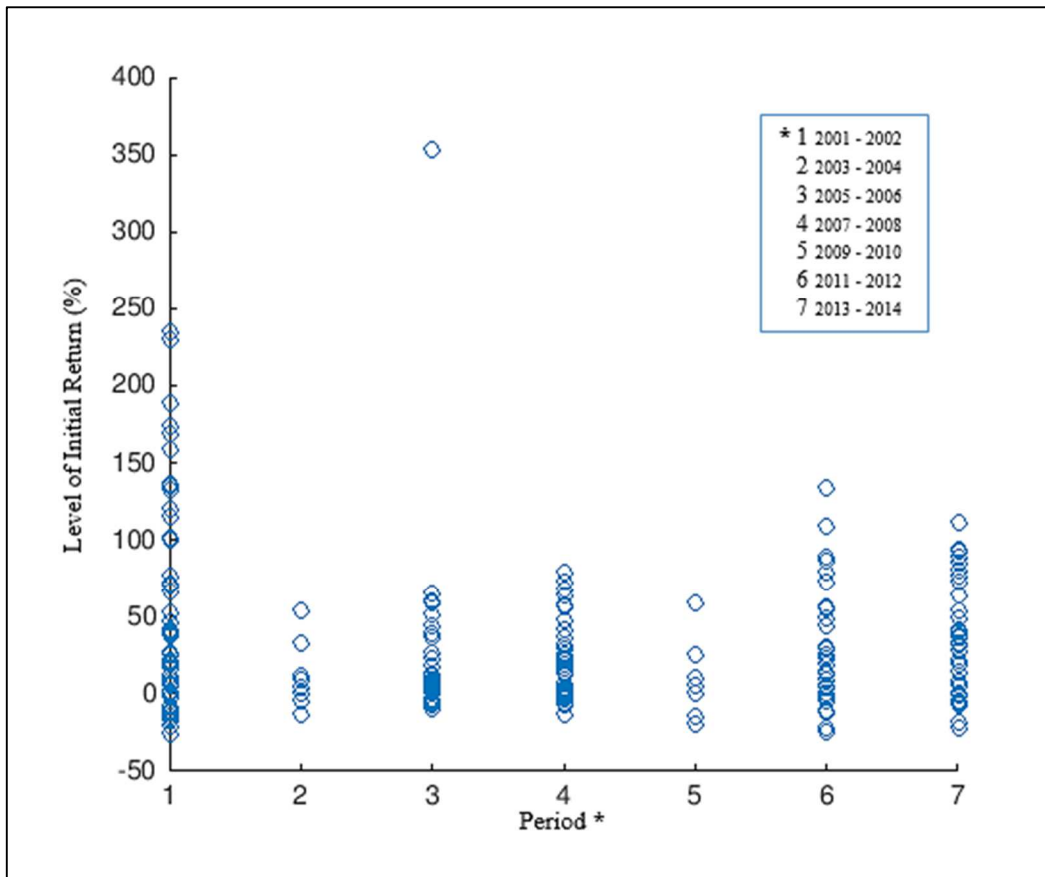


Figure 30 – Scatter Plot which shows Initial Return for IPOs in different years.
 (Source: own illustration based on sample data)

APPENDIX B

	Year Ended December 31,				
	2007	2008	2009	2010	2011
(in millions, except per share data)					
Consolidated Statements of Operations Data:					
Revenue	\$ 153	\$ 272	\$ 777	\$1,974	\$3,711
Costs and expenses:					
Cost of revenue	41	124	223	493	860
Marketing and sales	32	76	115	184	427
Research and development	81	47	87	144	388
General and administrative	123	80	90	121	280
Total costs and expenses	277	327	515	942	1,955
Income (loss) from operations	(124)	(55)	262	1,032	1,756
Other expense, net	11	1	8	24	61
Income (loss) before provision for income taxes	(135)	(56)	254	1,008	1695
Provision for income taxes	3	—	25	402	695
Net income (loss)	<u>\$ (138)</u>	<u>\$ (56)</u>	<u>\$ 229</u>	<u>\$ 606</u>	<u>\$1,000</u>
Net income (loss) attributable to Class A and Class B common stockholders					
	<u>\$ (138)</u>	<u>\$ (56)</u>	<u>\$ 122</u>	<u>\$ 372</u>	<u>\$ 668</u>
Earnings (loss) per share attributable to Class A and Class B common stockholders:					
Basic	<u>\$(0.16)</u>	<u>\$(0.06)</u>	<u>\$0.12</u>	<u>\$ 0.34</u>	<u>\$ 0.52</u>
Diluted	<u>\$(0.16)</u>	<u>\$(0.06)</u>	<u>\$0.10</u>	<u>\$ 0.28</u>	<u>\$ 0.46</u>
Pro forma earnings per share attributable to Class A and Class B common stockholders:					
Basic					<u>\$ 0.49</u>
Diluted					<u>\$ 0.43</u>

Figure 31 - Consolidated Income Statement from 2007 to 2011. (Source: Facebook's 2011 Registration Statement)

	As of December 31,				
	2007	2008	2009	2010	2011
(in millions)					
Consolidated Balance Sheets Data:					
Cash, cash equivalents, and marketable securities	\$ 305	\$ 297	\$ 633	\$1,785	\$3,908
Working capital	250	279	703	1,857	3,705
Property and equipment, net	82	131	148	574	1,475
Total assets	448	505	1,109	2,990	6,331
Total liabilities	174	170	241	828	1,432
Total stockholders' equity	273	335	868	2,162	4,899

Figure 32 - Consolidated Balance Sheet Data (2007-2011). (Source: Facebook's 2011 Registration Statement)

	<u>December 31,</u>	
	<u>2010</u>	<u>2011</u>
Assets		
Current assets:		
Cash and cash equivalents	\$1,785	\$1,512
Marketable securities	—	2,396
Accounts receivable, net of allowances for doubtful accounts of \$11 and \$17 as of December 31, 2010 and 2011, respectively	373	547
Prepaid expenses and other current assets	88	149
Total current assets	2,246	4,604
Property and equipment, net	574	1,475
Goodwill and intangible assets, net	96	162
Other assets	74	90
Total assets	<u>\$2,990</u>	<u>\$6,331</u>
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	\$ 29	\$ 63
Platform partners payable	75	171
Accrued expenses and other current liabilities	137	296
Deferred revenue and deposits	42	90
Current portion of capital lease obligations	106	279
Total current liabilities	389	899
Capital lease obligations, less current portion	117	398
Long-term debt	250	—
Other liabilities	72	135
Total liabilities	828	1,432
Commitments and contingencies		
Stockholders' equity:		
Convertible preferred stock	615	615
Common stock	—	—
Additional paid-in capital	947	2,684
Accumulated other comprehensive loss	(6)	(6)
Retained earnings	606	1,606
Total stockholders' equity	2,162	4,899
Total liabilities and stockholders' equity	\$2,990	\$6,331

Figure 33 - Consolidated Balance Sheet. (Source: Facebook's 2011 Registration Statement)

	Three Months Ended					
	Dec 31, 2010	Mar 31, 2011	Jun 30, 2011	Sep 30, 2011	Dec 31, 2011	Mar 31, 2012
	(in millions)					
Consolidated Statements of Income Data:						
Revenue:						
Advertising revenue	\$ 655	\$ 637	\$ 776	\$ 798	\$ 943	\$ 872
Payments and other fees revenue	76	94	119	156	188	186
Total revenue	731	731	895	954	1,131	1,058
Costs and expenses ⁽¹⁾ :						
Cost of revenue	150	167	210	236	247	277
Marketing and sales	59	68	103	124	132	159
Research and development	45	57	99	108	124	153
General and administrative	40	51	76	72	80	88
Total costs and expenses	294	343	488	540	583	677
Income from operations	437	388	407	414	548	381
Net income	\$ 251	\$ 233	\$ 240	\$ 227	\$ 302	\$ 205

(1) Costs and expenses include share-based compensation expense as follows:

Figure 34 – Quarterly Consolidated Income Statement. (Source: Facebook Investor Relations, Q1 - 2012)

APPENDIX C

SENSITIVITY ANALYSIS						
Cost of Capital		Final Growth Rate				
0-5 years	6-10 years	1%	1.5%	2%	2.5%	3%
8,90%	7,27%	\$30,77	\$33,38	\$36,49	\$40,24	\$44,88
9,40%	7,77%	\$27,19	\$29,31	\$31,81	\$34,77	\$38,36
9,90%	8,27%	\$24,16	\$25,91	\$27,94	\$30,32	\$33,15
10,40%	8,77%	\$21,55	\$23,01	\$24,68	\$26,62	\$28,89
10,90%	9,27%	\$19,30	\$20,53	\$21,92	\$23,52	\$25,37

Table 22 - DCF Sensitivity Analysis, changing Final Growth Rate and Cost of Capital.
(Source: own illustration based on sample data)

SENSITIVITY ANALYSIS (Cost of Capital By Sector)									
*Cost Of Capital			Final Growth Rate						
	2011	2017	0-5 years	6-10 years	1%	1.5%	2%	2.5%	3%
Advertising Sector	11,42%	6,57%	11,42%	6,57%	\$31,80	\$34,88	\$38,64	\$43,32	\$49,31
Internet Sector	8,37%	9,97%	8,37%	9,97%	\$19,42	\$20,55	\$21,81	\$23,25	\$24,89
Facebook	9,90%	8,27%	9,90%	8,27%	\$24,16	\$25,91	\$27,94	\$30,32	\$33,15

Table 23 - DCF Sensitivity Analysis using the Average Cost of Capital of Advertising and Internet Sector.
(Source: own illustration based on sample data)

SENSITIVITY ANALYSIS						
Sales to Capital Ratio		EBIT Margin (Terminal Year)				
0-5 years	6-10 years	20%	25%	30%	35%	40%
0,75	1,10	\$11,97	\$17,74	\$23,52	\$29,30	\$35,07
0,85	1,20	\$14,39	\$20,17	\$25,95	\$31,72	\$37,50
0,95	1,30	\$16,39	\$22,16	\$27,94	\$33,71	\$39,49
1,05	1,40	\$18,05	\$23,83	\$29,61	\$35,38	\$41,16
1,15	1,50	\$19,47	\$25,25	\$31,02	\$36,80	\$42,57

Table 24 - DCF Sensitivity Analysis, changing EBIT Margin and Sales to Capital Ratio.
(Source: own illustration based on sample data)

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