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Is Internet industry facing a bubble 2.0?

por

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Tese de Mestrado em Finanças

Orientada por:

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2013

About the author

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Acknowledgements

First, I would like to acknowledge my dissertation supervisor, Professor Miguel Sousa. His guidance, strategic thinking and experience were essential throughout this process.

I would also like to express my gratitude to all the people that have supported me during this research, in particular my family and my boyfriend, João.

An especial acknowledgement to Rita and Vasco for their time and inputs that were critical for this work.

Finally, it is with deep gratitude that I dedicate this dissertation to my grandfather and grandmother, whose honesty, dedication and hard-work have always been a strong reference to enhance all my efforts and an inspiration to overcome myself.

Abstract

During the so called dot-com bubble period in the late 1990s, the question of whether the Internet stock prices could be explained or not by companies' fundamentals was intensely discussed and studied. Ten years later, the high valuations of recent Internet IPOs, justified mostly on the basis of a growing number of Internet users and less on the basis of the companies' fundamentals, led many to wonder if the Internet industry is facing a valuation bubble 2.0.

This study explores the impact of the major (financial and non-financial) value-drivers, identified during the previous dot-com bubble, on the recent Internet companies' IPO stock price and whether that impact differs from the one observed in the previous dot-com wave. Additionally, by analyzing more than one non-financial measure at the same time we are able to identify the relative incremental explanatory power on the IPO stock price of those non-financial measures.

Key words: Internet IPO; valuation; economic fundamentals; media hype; web traffic.

JEL: G12 - Asset Pricing, G14 - Information and Market Efficiency; Event Studies, G32 - Financing Policy; Capital and Ownership Structure

Resumo

No final da década de 1990, durante o período designado por bolha das *dot-com*, a questão sobre se os preços das ações das empresas no sector da Internet poderiam ou não ser explicados pelos seus fundamentais, foi intensamente analisada e discutida. Dez anos mais tarde, o facto de os elevados preços das ações nas recentes Ofertas Públicas Iniciais (OPIs) neste sector serem essencialmente justificadas pelo número crescente de utilizadores, em detrimento dos fundamentais económicos das empresas, tem levantado a questão se este sector tecnológico não estará perante uma nova versão da bolha do final da década de 1990.

Este estudo explora o impacto dos principais fatores (financeiros e não financeiros), identificados durante a anterior bolha, que influenciam o preço das ações das empresas de Internet, assim como se esse impacto difere do observado na anterior vaga de OPIs no sector das *dot-com*. Adicionalmente, através da análise de diversos indicadores não-financeiros, é possível identificar o poder explicativo relativo de cada um desses indicadores não financeiros no preço das ações IPO.

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1 Introduction

"Another bubble? Some tech start-ups look over-valued"

(The Economist, 2010)

"It's Officially Silly Season for Internet Valuations"

(Forbes, 2011)

In recent years, the growing number of high speed Internet users led to a new proliferation of "dot-coms", especially social networking sites. The apparently rising buy-outs prices and the valuations of recent IPOs, justified mostly on the basis of a growing number of Internet users and less on the basis of the companies' fundamentals (sometimes with no discernible monetization strategy), led many to wonder if tech industry is facing a bubble 2.0. The valuation of Internet IPOs like Facebook, Inc. received huge attention from the media. Several argued that Facebook's IPO was grossly overvalued. Bloomberg (May 2012) reported that "Facebook would be valued at 99 times its earnings, a higher multiple than 99 percent of companies in the Standard & Poor's 500 Index". Other cases such as the Linkedin Corporation IPO, with a first day underpricing of 109%, Groupon Inc. IPO, which has fallen from its $20 IPO price to about $7.15 in nearly nine months, contributed for the huge media hype surrounding this bubble hypothesis.

During the so called dot-com bubble period in the late 1990s, many authors discussed and studied whether the Internet stock prices could be explained by the companies' fundamentals and/or by non-financial measures.

Regarding financial measures, some authors suggested that the financial information of companies from young, fast-changing, technologic industries is of limited value to investors and it needs to be carefully analyzed. For instance, they argued that in the case of the Internet industry losses enhance, not reduce, firm value (Van der Goot and Knauff, 2001). Trueman et al. (2000) suggested that in order to gather more value from the financial information provided by the companies, investors should pay attention not only to the net income but also to the decomposition of the net income into its components, as the individual income statement line items have different implications for future profits.

Additionally, several authors (Demers and Lev, 2001; Trueman et al., 2000; Rajgopal et al., 2000; Hand, 2001) found that web traffic (a non-financial measure) is also an important indicator of the market values of Internet firms, especially Business-to-Consumer [1] (B2C) firms. Since this indicator provides information about the consumers' interest in the web business, it is central to predict the revenue generation and growth of Business to Consumer (B2C) Internet firms (Rajgopal et al., 2000). Alternatively, other authors (Bhattacharya et al., 2009; DuCharme et al., 2001a; DuCharme et al., 2001b) suggested the media hype[2] as a non-financial value driver.

Another important topic during the dot-com bubble was the unprecedented level of underpricing in Internet IPOs. Although several explanations were explored, such as, the riskiness of the IPO companies, the use of the IPO underpricing as a "branding" opportunity and the greater proportion of retail investors (less informed investors) entering the market, this is still an open subject.

Although many studies investigated these topics during the dot-com bubble, despite the recent hype around a potential bubble 2.0 in Internet industry, the studies focusing on recent Internet IPOs are still rare or nonexistent. This dissertation tries to fill this gap, by analyzing the financial and non-financial value drivers of the Internet companies that went public in recent years.

This study explores the impact of the major (financial and non-financial) value-drivers, identified by former research during the previous dot-com bubble, on the Internet companies' IPO stock price (and short term return) and whether that impact differs from the one observed in the previous dot-com wave. Additionally, by analyzing more than one non-financial measure at the same time we are able to identify the relative incremental explanatory power on the IPO stock price of the non-financial measures. We mostly follow Trueman et al. (2000) methodology, using a sample of B2C Internet IPOs, however, prior literature is extended by examining not only the explanatory power of web traffic as a non-financial measure, but also by considering the media hype as another possible non-financial measure, and by allowing the comparison between them.

[1] Business-to-consumer (B2C) companies are companies that provide products and services directly to the end user, while business-to-business (B2B) companies deal primarily with other businesses, not the general public.

[2] Media hype or media exposure can be defined as an intensive or exaggerated publicity in the mass media and can be measured using statistics such as number of mentions in the press, web and social media and multimedia.

The dissertation is organized as follows. Section 1 introduces the thesis. Section 2 outlines the IPO process, provides a brief background on the Internet industry and the dot-com bubble and reviews prior research on Internet stock prices (and short term returns) value drivers. Section 3 discusses the sample construction and provides a description of the data while Section 4 describes the methodology used. Section 5 presents the results and Section 6 concludes.

2 Literature Review

This section begins with a brief description of the Initial Public Offering (IPO) process, as well as its importance for the companies. It is followed by a revision of the main literature regarding the Internet industry, particularly concerning the dramatic rise and fall of Internet stocks in the late 90s early 2000s, usually referred as the dot-com bubble, and by the empirical literature regarding the IPO underpricing and posterior stock prices of Internet companies.

2.1 The IPO process

*"For a company, going public typically marks the transformation from startup adolescence to corporate adulthood." (*Bartov et al., 2002, pp. 324)

Going public is the process of offering securities of a privately owned company for sale to the general public (PricewaterhouseCoopers, 2010).

Ross et al. (2003) define an initial public offering (IPO) or an unseasoned new issue as the first public equity issue that is made by a company. As explained by the authors, all initial public offerings are cash offers[1] because, if the firm's existing shareholders were available to buy the stocks, the firm would not need to sell them publicly. A seasoned new issue refers to a new issue of a listed company.

Going public is an important step in the life of a young company. Ljungqvist (2004) points out the following advantages of taking that step: it provides access to public equity capital, which may lower the company's cost of funding; it provides a venue for trading the company's stocks, enabling its existing stockholders to diversify their investments and to concretize their capital gains from backing the company (especially important for venture capitalists).

The IPO can be made through different methods, namely the fixed price method, the auction or the book building method. In the fixed price method the price at which the securities are offered by the issuer is made known in advance to the investors.

[1] Public companies can issue securities by making a general cash offer to investors at large (cash offer) or by making a rights offer, offering the securities to the firm's existing stockholders.

According to the auction mechanism, the issuer sets a minimum acceptable price and investors make bids on the offering (the bids include price and number of stocks). In the book building process, the underwriter and the issuer set a price range within which they want to set the IPO price and then the underwriter presents the stocks to a number of institutional investors that place non-binding indications of interest in the stock. This method has become the dominant IPO procedure in most major world markets, including the U.S. According to this method as soon as the company's board of directors decides to go public, the company hires an investment banker to underwrite the offering. Then the company, with the help of the investment bank, drafts the prospectus, containing, among other things, financial information about the company and the terms of the offer, such as the offer price (in a firm commitment offer), stated in the form of a range/interval whose midpoint is the expected offer price. Upon completion, the prospectus is filed with the Securities and Exchange Commission (SEC). Bartov et al. (2002) state that the time between the filing of the prospectus and the final offer date ("waiting period") is used by the investment banker to collect information about the demand from investors through non-binding indications of interest. If demand for the issue is greater (lower) than initially expected, the final offer price will be set near the top (low) end of the interval set in the prospectus. It is a well-documented fact that IPOs tend to be underpriced, i.e. they tend to trade significantly above their offer price in their debut (Bartov et al., 2002).

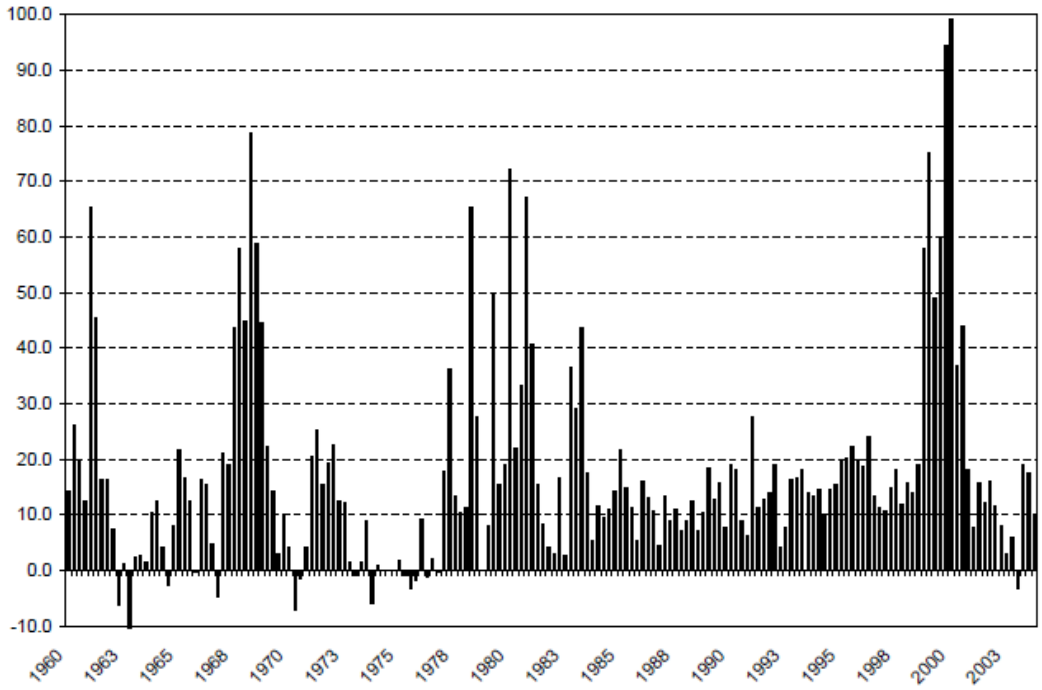
As stated by Ljungqvist (2004), underpricing is estimated as the percentage difference between the price at which the IPO stocks were sold to investors (the offer price) and the price at which the stocks subsequently trade in the market. Ljungqvist (2004) also defines/measures underpricing as the (dollar) amount of 'money left on the table' - the difference between the aftermarket trading price and the offer price, multiplied by the number of stocks sold at the IPO. This calculation has an implicit assumption: "*shares sold at the offer price could have been sold at the aftermarket trading price instead – that is, that aftermarket demand is price-inelastic*". As Ljungqvist (2004) suggested underpricing is costly to a firm's owners: stocks sold for personal account are sold at too low a price, while the value of stocks retained after the IPO is diluted.

Ljungqvist (2004) also concludes that underpricing in the U.S. has averaged, over long periods of time, between 10 and 20 percent, but as shown in Figure 1, with a

substantial degree of variation over time. Figure 1 illustrates the fact that it is more frequent to see periods of underpricing in opposition of overpricing. In the years 1999 and 2000, U.S. issuers left an aggregate of $62 billion on the table and the average IPO was underpriced by 71% and 57% respectively.

Figure 1 – Initial IPO returns in the United States, 1960 to 2003. Source: Ljungqvist (2004).

The figure reports quarterly equal-weighted average initial IPO returns in % for 14,906 IPOs completed in the United States between 1960 and 2003, calculated as the first-day closing price over the IPO offer price less one. Source: Ljungqvist (2004).



2.2 The Internet Industry

2.2.1 Internet companies

According to the website www.internet.com, Internet companies are defined as those companies that generate more than 51% of their revenues from or because of the Internet[2].

[2] These criteria were used by several studies during the dot-com bubble, e.g. Hand (2000 and 2001), Bartov et al. (2002) and DuCharme et al. (2001a). It is important to note that the website with the domain www.internet.com no longer provides this information.

These companies, as explained by Kozberg (2001, pp. 9), "*begin by making large expenditures on R&D to develop a site's quality, improving their ability to retain viewers (proxied for by visits and time spent per person) and attract new ones via reputation effects. In addition, firms engage in major advertising campaigns and other promotions oriented towards attracting larger audiences. As audience increases so does the number of pages viewed, increasing the advertising and promotion based revenue opportunities for the firm. Increased audience could also lead to additional opportunities resulting from network economies of scale and scope*".

2.2.2 The Dot-com Bubble

Girdzijauskas and Štreimikienė (2009) state that a bubble happens when speculators notice the swift rise in value of stocks and then decide to buy more of the same stocks as a way of anticipating further rises rather than based on the belief that there is a general undervaluation of the stocks. Due to this buying spree, many companies' stocks become grossly overvalued creating a widening discrepancy between the price and the actual value of the stocks.

When the bubble bursts the stock prices will fall dramatically trying to seek the fundamental value of the stocks. However, as also noted by the authors, the term "stock market bubble" can only be used with any certainty in retrospect, after the stock's price have fallen drastically or crashed.

Barber and Odean (2001) cited by Bhattacharya et al. (2010) identify several market conditions that are conducive to the formation of speculative bubbles: (1) the availability of large amounts of capital; (2) significant uncertainty regarding firm valuation; and (3) an inexperienced but active investor clientele.

The huge growth in market value of the Internet sector since its inception has led many, as Alan Greenspan, to speculate about the presence of a financial bubble in the Internet sector. In 1997, in his testimony to the U.S. Senate, the former U.S. Federal Reserve chairman Alan Greenspan suggested the existence of a bubble: "*Is it possible that there is something fundamentally new about this current period that would warrant such complacency? Yes, it is possible. Markets may have become more efficient, competition is more global, and information technology has doubtless enhanced the*

stability of business operations. But, regrettably, history is strewn with visions of such new eras that, in the end, have proven to be a mirage. In short, history counsels caution".

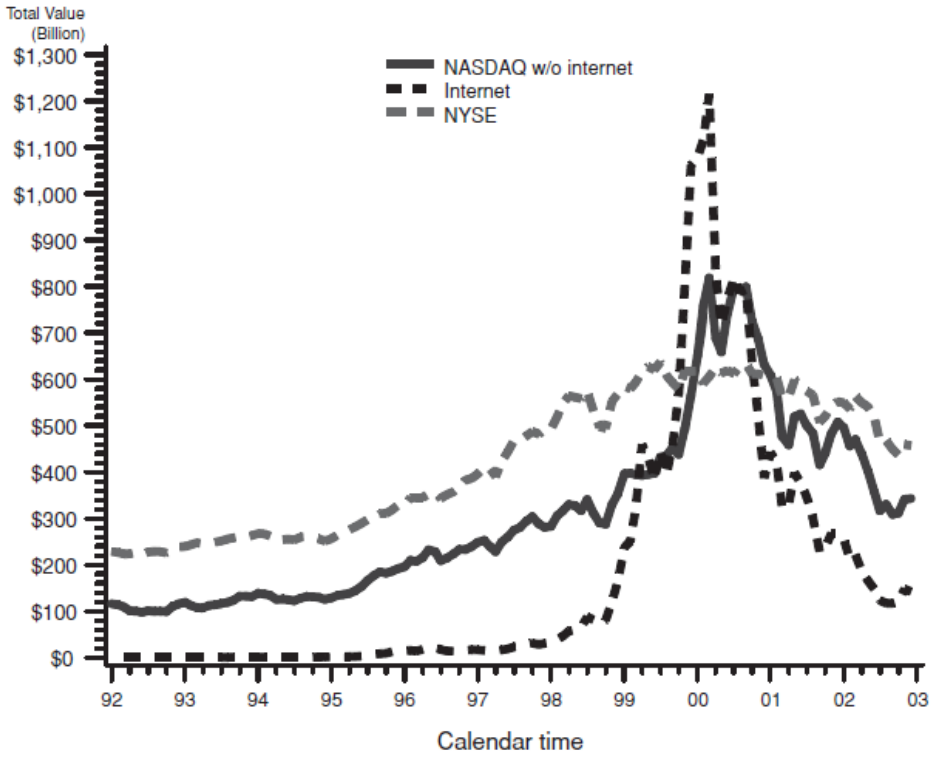
Demers and Lev (2001) report that the Internet sector has evolved from a nascent stage industry to become the third-largest technology sector by market value in 1999. By February 2000, as reported by Ofek and Richardson (2003), the Internet sector equalled 6% of the market capitalization of all U.S. public companies and 20% of all publicly trade equity volume. Moreover, in just a two-year period the entire sector generated a return over 1000% on their public equity.

In March of 2000, three years after Alan Greenspan's testimony, the spectacular rise in Internet values was followed by a dramatic fall of the prices, which continued throughout 2000 and led many to designate this phenomenon as the "Internet bubble" or the "dot-com bubble".

The Figure 2, by Bhattacharya et al. (2010), presents a time series chart of the market value of publicly-traded Internet firms beginning in 1992, when America Online first went public, through to the end of 2003. This graph shows the extraordinary rise in Internet market values, as well as the following dramatic fall. It also includes two lines, one representing the aggregate market capitalization of the NASDAQ (excluding Internet firms) and other representing the average market capitalization of NYSE firms, allowing us to compare the growing line of the Internet values until 2000 with the relatively flat lines of the non-Internet NASDAQ and NYSE firms.

Figure 2 – Total Market Capitalization: Internet Industry versus Nasdaq and NYSE. Source: Bhattacharya et al. (2010)

Nasdaq without Internet represents the market capitalization of all NASDAQ firms excluding Internet firms, scaled by a factor of 10, for greater comparability with the Internet industry. NYSE represents the market capitalization of all NYSE firms scaled by a factor of 20 for comparability. All dollar amounts are inflation-adjusted and stated in January 2003 dollars.



However, according to Ofek and Richardson's (2003) we cannot necessarily infer from this dramatic fall in Internet market values that market prices did not in fact reflect fundamental values about cash flows. Changing expectations about cash flows or discount rates, coupled with the realization of various Internet fundamentals, could also explain the rise and drop in prices. Several authors tried to validate this hypothesis. Bhattacharya et al. (2010) reported that accounting fundamentals were very weak for the majority of Internet IPO firms despite the optimism expressed by investors regarding these companies (first day returns to Internet IPOs averaged over 80%). According to the authors, 88% of Internet companies reported negative earnings in the year prior to their IPO, 91% of these had accumulated deficits, and many Internet firms did not even have revenues at the time of their IPOs. In the end, over 24% of publicly-traded Internet companies ultimately failed within five years of their IPO.

While some argue that revenues are the key driver of Internet stock prices, others defend that conventional metrics, such as earnings and book values, are irrelevant to the pricing of Internet stocks, because non-financial metrics "call all the shots". Moreover, many analysts and commentators advocate that earnings can be relevant to Internet stock pricing but in an unconventional way, as larger losses can reflect Internet companies' huge investments in intangible marketing assets and can therefore be related to higher market values. This topic, especially the value drivers of Internet stock prices, will be more extensively addressed in section 2.3.

As stated before, despite the weak fundamentals for the majority of Internet IPO companies, the underpricing during those years exceeded the average over long periods of time. Loughranand and Ritter (2004) reported 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 decreasing to 12% during the years between 2001 and 2003.

2.2.3 The Web 2.0

Due to its rapid and world-wide impact on business and communications, in 2001 Van der Goot and Knauff (2001, pp. 3) defended that "*the Internet is transforming society and business life in a revolutionary way. Many compare the impact on society and business life of this "information revolution" with the industrial revolution or the invention of the telephone and radio*".

Since 2001, the Internet sector continued to mature and evolve, based on a rapidly developing technology and serving as a point of convergence for many traditional and newer industries (Kozberg, 2001).

A couple of years after the bubble burst, the concept of "Web 2.0" (contrasting with the "Web 1.0") was brought by John Battelle and Tim O'Reilly at the first Web 2.0 conference, in October 2004. The purpose of the conference was to identify Internet transitions since the dot-com crash. O Reilly defended that "*far from having "crashed",*

the web was more important than ever, with exciting new applications and sites popping up with surprising regularity".[3]

The Society for Technical Communication newsletter of March/April 2011 defines a Web 2.0 site as one that "*allows users to interact and collaborate with each other in a social media environment, as consumers of user-generated content in a virtual community. This contrasts with Web sites, which limit users to viewing content that they create and control. Examples of Web 2.0 include social networking sites, blogs, wikis, video sharing sites, hosted services, Web applications, and "folksonomies" (folk taxonomies)".*

One important part of Web 2.0 is the Social Web, which represents a fundamental shift in the way individuals communicate. "*The Social Web includes a number of online tools and platforms where people share their perspectives, opinions, thoughts and experiences. The end user is not only a user of the application, but also a participant by: podcasting; blogging; tagging; contributing to Really Simple Syndication (RSS); social bookmarking; social networking"* (The Society for Technical Communication newsletter of March/April 2011).

In Spencer-Scarr's (2009, pp. 1) opinion, it has become increasingly important to understand Web 2.0's impact and role in society: "*over the last four years Web 2.0 has become a pivotal phrase for a social paradigm shift which is being adopted and adapted by enterprise: finding its way into business methodologies and common technology such as mobile phones".*

2.3 Drivers for Internet stock prices

"*Forget all the financial wizardry. Virtually every Wall Street analyst has tried to concoct some formula to pinpoint the correct valuation of Internet stocks. But those efforts are pretty much shots in the dark. The stock prices of these companies are based largely on what the future holds for the Web, and no crystal ball can predict that. So you've got to make a gut call. My gut tells me the Internet is going to be big. No, huge" -* Linda Himelstein (BusinessWeek 4/17/99) cited by Estrada and Blakely (2009)

[3] Retrieved from http://oreilly.com/web2/archive/what-is-web-20.html, 3 January 2013.

During the so called bubble period, many studies discussed this controversial topic (Internet companies' valuation) more specifically whether the Internet stock prices could be explained by fundamentals.

Some studies suggest that the financial information of firms in young, fast-changing, technology based industries is of limited value to investors. Others, such as Demers and Lev (2001), point out that most Internet companies have also come to rely upon non-financial measures of web traffic activity, as indicators of the current performance and future cash generating ability of these intangible asset based firms. The availability of this data provided an opportunity for many researchers to explore how investors supplement relatively sparse financial information with non-financial data, in the valuation process (Trueman et al., 2000).

Several studies presented evidence on the financial and non-financial value drivers for Internet stocks. Although the most relevant information about each paper is summarized in Appendix 1, a brief description of what is crucial to our analysis will be developed in the next section.

2.3.1 Financial Drivers

According to Trueman et al. (2000), there are two fundamental reasons why it was so difficult to value Internet firms back in the late 1990s. First, the industry and the firms within it were so young that there was very little historical financial information available to forecast future profitability. Second, the industry was evolving at such a rapid pace that whatever historical information existed was likely to be less useful for valuing these firms than for valuing those in more established industries, or even those in non-Internet high-tech industries.

Several authors discussed the shortcomings of using the traditional theoretical valuation models to value Internet companies.

Estrada and Blakely (2009) discuss two shortcomings of the use of the discounted cash flow (DCF) model valuation for Internet companies. First, they state that most Internet companies neither have positive cash flows nor they expect to have them in the foreseeable future. The lack or limited availability of historical data (used to estimate forecast inputs more precisely or to check reasonability of forecasts) in

combination with a highly uncertain future makes it possible to justify almost every estimate for Internet companies. In that case, the value of an Internet company depends solely on individual expectations of the future (Van der Goot and Knauff, 2001). Discount rates are typically estimated with the CAPM, which has, as a critical input, the company's beta, for which several years of data are needed to estimate it. Therefore, Estrada and Blakely (2009) argue that another shortcoming for DCF valuation for Internet companies is the fact that the estimation of betas typically rely on a very limited (and rarely representative) history of stock returns.

Alternatively to the absolute valuation approach of the DCF model, relative valuation is a widely used method for valuing Internet companies (Van der Goot and Knauff's, 2001). Kim and Ritter (1999) explain that in relative valuation using accounting multiples, a company's financial and operational performance is compared with that of several publicly owned companies in the same or a similar industry - the peer group. It is therefore implicit this approach works better when a highly comparable group is available. A problem shared between this and the other methods of relative valuation discussed above, is that regardless of the fact that the relative approach "*can reduce the probability of misvaluing a firm relative to others, this approach provides no safeguard against an entire sector being undervalued or overvalued"* (Kim and Ritter, 1999, pp. 412).

Attending to the mentioned shortcomings and the historical behaviour of Internet stock prices, especially during the dot-com bubble, several studies have tried to identify the main Internet stock value drivers.

Bartov et al. (2002) results indicate that the valuation of Internet firms departs from conventional knowledge, with earnings not being priced and negative cash flows being priced perhaps because they are viewed as investments. In the case of the Internet industry, companies invest heavily in customer base creation and brand development, leading to large costs in marketing and research and development (R&D) that are either immediately expensed in income statements or capitalised and quickly amortised. For that reason most of the Internet companies report losses or minimal profits, and some authors even defend that, in this type of companies, losses enhance, not reduce, firm value *(*Van der Goot and Knauff, 2001).

Demers and Lev (2001) also found that product development (R&D) and advertising expenses (customer acquisition costs) appear to be capitalized as assets by

investors in their assessment of Internet company value during the bubble period, when investors were more optimistic about the prospects of Business-to-consumer (B2C) companies. However, their study concludes that after the bursting of the bubble in 2000, investors adopted a more skeptical attitude with regards to intangible investments (product development and customer acquisition costs), and the excesses of the early 1998-1999 valuations were systematically eliminated.

In what concerns to marketing and R&D expenses, Hand (2000) concludes that Internet companies' market values are reliably positive and concave[4] in selling and marketing and research and development expenses when net income is negative. The author explains that the concavity in the pricing of core net income, R&D costs and selling and marketing expenses runs counter to the notion that Internet companies are expected to benefit from extraordinary profitability stemming from large strategic operating options, or increasing returns-to-scale.

2.3.2 Non-Financial Drivers

Trueman et al. (2000) state that the Internet industry offers one important advantage: the availability of a substantial amount of non-financial data on Internet usage that can be employed in the prediction of future revenues. It is expected that current traffic at an Internet company's web site (such as statistics on website page views and visitors, among other numbers) will be positively related to future revenues, as it reflects potential future demand for the company's products and, at least indirectly, affects the rates the firm can charge for advertising on its web site. This indicator provides information about the extent of consumer interest in the web business and is central to revenue generation and growth of B2C Internet firms (Rajgopal et al., 2000).

Kim and Ritter (1999) also defend that financial information seems less relevant for explaining relative valuation of young, fast growing companies, and therefore, multiples based on non-financial information should be used in this cases.

[4] As presented in Appendix 1, Hand (2000) followed a log-linear regression.

Trueman et al. (2000), Demers and Lev (2001), Rajgopal et al. (2000) and Hand (2001)[5] studied how investors employ financial information, along with measures of Internet usage, in the valuation of Internet firms. The authors found web performance measures to be value-relevant to the stock prices of Internet companies, providing (often considerable) incremental explanatory power for stock prices and indicating that investors rely heavily on web traffic measures.

The previous studies focused mainly on the web traffic as a non-financial value driver for Internet stock prices. However, some studied the pricing of the Internet stocks during the dot-com bubble focused on the media hype as a non-financial value driver.

DuCharme et al. (2001a) cite Robert Shiller in his book, Irrational Exuberance *"the effect of the media on investor psychology is undoubtedly one of the driving factors behind the bull market"* and seek to provide empirical evidence on the importance of creating "buzz" to promote Internet valuations in the "new economy". The authors found strong evidence that underpricing increases with the extent of media exposure, especially coverage in the electronic media, that the firm attracts seven days before the IPO date.

Bhattacharya et al. (2009) found out that there was more media coverage for Internet firms than for non-Internet firms and that coverage was more positive for Internet IPOs in the bubble period and more negative post-bubble. However, Bhattacharya et al. (2009) also show that the media coverage was not a significant factor in the Internet bubble in the late 1990s.

[5] Trueman et al. (2000) used the unique users and page views as web traffic measures. For a given firm, unique visitors is the estimated number of different individuals who visit the firm's web site(s) during a particular month. Page views is the estimated number of pages viewed by those individuals visiting the firm's web site(s) during the month.
Demers and Lev (2001) used the reach, stickiness and customer loyalty as web traffic measures. "Reach" factor reflects the extent to which the Internet company is able to attract unique visitors. "Stickiness" captures the notion of how long visitors stay at the site once they're there. "Customer loyalty" is driven primarily by the average number of visits to the site per unique visitor per period.
Rajgopal et al. (2000) used the unique visitors as web traffic measure. Unique visitors as the number of web-active individuals who visited a particular site(s) belonging to a web property (company) within a given time period. Each visitor is represented only once as a unique user.
Hand (2001) used the number of unique visitors to the firm's web site.

2.4 Explanations for the underpricing in internet IPOs

Several studies suggest possible hypotheses for the unprecedented underpricing in Internet IPOs during the dot-com bubble.

2.4.1 Riskier IPOs are more underpriced than less-risky IPOs

Ljungqvist and Wilhelm (2003) conclude that high-tech, Internet-related and younger firms suffer from ex-ante uncertainty and have to accept a higher degree of underpricing. According to Loughran and Ritter (2004), the changing risk composition hypothesis, introduced by Ritter (1984), assumes that riskier IPOs will be underpriced by more than less-risky IPOs. This prediction follows models where underpricing arises as an equilibrium condition to induce investors into participating in the IPO market. Risk can reflect either technological or valuation uncertainty.

2.4.2 The use of the IPO as a "branding" opportunity

Ljungqvist and Wilhelm (2003) and DuCharme et al. (2001a; 2001b) argue that in some cases the underpricing is driven by the IPO as a "branding" opportunity where high visibility of a severely discounted IPO might serve a marketing function.

DuCharme et al. (2001a) defend that underpricing is a "branding" event that generates increased consumer awareness and possibly higher sales revenues. If entrepreneurs view the IPO event as a major "branding" opportunity, they should be willing to pay something (in foregone proceeds) for the increased media attention at the time of the offer, especially if it generates incremental business transactions in the firm's future. Considering that the benefits to the business to business (B2B) Internet firms would be minimal, this hypothesis is largely driven in the Internet market space by the B2C companies.

2.4.3 A shift in the type of investors entering the market (greater proportion of retail investors)

Ofek and Richardson (2003) provided another possible explanation for underpricing during the dot-com bubble. Contrary to previous assumptions the authors reject the idea that prices reflect fundamental values of cash flows, instead they argue that higher valuation reflects the fact that "optimistic" investors overwhelm "pessimistic" ones.

In Internet-related industries there was no past history to guide investors, so it is possible that individual investors believed the hype about the Internet and transferred those beliefs into asset prices, ignoring information about cash flows.

Ofek and Richardson (2003) also show evidence that suggests the Internet sector was more prone to retail than institutional investing at least relative to non-Internet firms - a considerable number of new and less sophisticated (i.e., retail) investors were trading Internet stocks. The magnitude of the volume suggests this may have been at unparalleled levels.

The authors conclude that there were many optimistic investors arriving to the market willing to pay high prices for Internet stocks. They argue that if more retail investors were in the market than under normal conditions, then one might reasonably argue that the market was more prone to the types of behavioral biases that lead to overly optimistic beliefs.

In sum, while the first two hypotheses provide rational explanations to underpricing, the third hypothesis suggests that underpricing might result from irrational behavior on the part of investors who tend to overreact to the IPO, leading prices above fundamentals.

3 Data Sources and Sample Description

To study the impact of the major (financial and non-financial) value-drivers on the IPO pricing (and short term return) of Internet companies from the Web 2.0, a sample of recent transactions was gathered from Capital IQ[8].

3.1 Sample Selection Criteria

The selected sample covers the period from January 2009 to February 2013 and was chosen using the following screens in Capital IQ database:

1) Transaction Types: "Public Offerings";
2) Transaction Primary Features: "Public Offering – IPO";
3) All Transactions Closed Date: "[1/1/2009-2/8/2013]";
4) IPO Exchange: "All US Exchanges";
5) Industry Classifications (Target/Issuer): "Internet Software and Services (Primary)" OR "Internet Retail (Primary)";
6) SIC Codes (Target/Issuer): "7370 Computer programming, data processing, and other computer related services" OR "7371 Computer programming services" OR "7372 Prepackaged software".

Given these constraints, Capital IQ retrieved 135 companies. The sample was then restricted to those 52 Internet companies for which non-financial measures, such as web traffic measures, are expected to be economically important, more precisely to Business to Consumer (B2C) firms. In the end, 11 companies that went public in over-the-counter (OTC) markets were dropped, because the information available is not the same as to normal IPOs and 1 company was dropped because basic information, such as the number of outstanding stocks, was not found.

The appendix 2 provides a list of the remaining 40 B2C Internet companies that comprises the final sample.

[8] www.capitaliq.com

3.2 Data Sources

The financial data collected from Capital IQ, specifically the book value, total assets, sales, net income, gross profits, marketing expenses, R&D expenses, was collected from the last fiscal year before the IPO date. The stock prices for the end of the first day of trading were obtained from Google Finance[9].

The web traffic measures, such as the monthly Unique Visitors and Page Views, were obtained from Compete database[10]. Compete estimates site traffic and engagement metrics based on the daily browsing activity of over 2,000,000 U.S. Internet users. According to Compete's definition, the Unique Visitors metric only counts a person once, no matter how many times they visit a site in a given month. Unique Visitors are typically used to determine how popular a site is. The Page Views metric is used as an engagement metric. Each time a webpage is accessed by a visitor, it counts as one page view, irrespective of how many times the same user views the same page. Web traffic data for 13 companies was not available, since the database just retrieves data for the last 2 years.

The Media Hype variable, measured as the number of mentions of the company in the press, web and social media and multimedia, was collected on Factiva database. As in other studies, we restrict our search to seven days before the IPO to minimize the possibility of picking up the announcement of real economic actions, other than the IPO. Factiva is a business information and research tool owned by Dow Jones & Company, providing access to several sources, such as newspapers, journals, magazines, photos, etc.

3.3 Descriptive Statistics

Table 1 provides the descriptive statistics for the entire sample. As reflected in the table, the average IPO price is $16.75 (the median is 14.75) and it ranges from the $6.5 by Vipshop Holdings Limited to the $45 by LinkedIn Corporation. Regarding the Price-to-sales ratio (P/S ratio), the mean (median) value is 10.42 (5.04). Our average P/S ratios is more than twice than the average P/S ratio (4.61) presented by Damodaran for a

[9] www.google.com/finance
[10] www.compete.com

sample of 194 Internet companies as of January 2013[11].This difference emphasizes the possibility of a dot-com bubble 2.0 on Internet IPOs. The maximum value of 71.32 occurred in the Renren Inc IPO while the minimum value of 0.47 occurred in the Sky mobi Limited IPO. The P/S ratio increases in the 1st day of trading, being on average 13.92.

The average (median) underpricing, measured as the first day return is 25.38% (16.19 %). The Youku Tudou Inc. IPO was the one that left "more money in the table" with an underpricing of 161.25%, while SouFun Holdings Ltd. IPO was the most overpriced, with a negative return of 56.75% after the 1st day of trading.

The net income in the year before the IPO is, on average, 127.62 million dollars while the median value is only slightly positive (1.2 million dollars). On the contrary, the net income margin (net income deflated by sales) is on average negative while the median value is slightly positive (0.59%). The average (median) gross profit is equal to 477.60 million dollars (114.07 million dollars).

Regarding the other net income components, the companies in our sample present, in the year before the IPO, an average (median) value for Marketing Expenses and R&D Expenses equal to 55.34 million dollar (31.67 million dollars) and 88.18 million dollars (16.34 million dollars), respectively. Deflated by sales, the average Marketing Expenses ratio is equal to 25.64% and is twice the average R&D Expenses ratio (13.40%). Surprisingly, one company reported no Marketing Expenses, and three reported no R&D Expenses, including Groupon, Inc. Nevertheless the fact that Groupon, Inc. didn't report any R&D expenses, it is not surprising and it is consistent with the aggressive acquisition strategy followed by this company, the fact that Groupon, Inc. reported the highest MKTG/S ratio of our sample, an astonish value of 92.81%.

Finally, regarding non-financial measures and not surprisingly, Facebook, Inc. IPO (2,870) (followed by Zynga, Inc., Groupon, Inc., Pandora Media, Inc. and LinkedIn Corporation) scores the highest value for the media hype variable. It's important to notice that from all these companies, LinkedIn Corporation is the only one on the group of 10 companies with the highest underpricing values (in third place).

[11] http://pages.stern.nyu.edu/~adamodar/

With respect to the Internet usage measures, the average (median) of unique visitors per month at our firms' web sites is 10.38 million (1.32 million) and the average (median) of page views per month is 2,505.92 million (14.97 million). Once again, not surprisingly, Facebook, Inc. leads in terms of unique visitors and page views per month.

Table 1 – Descriptive Statistics

	N	Mean	Median	Std. Deviation	Minimum	Maximum
IPO price ($)	40	16.75	14.75	8.63	6.50	45.00
IPO price/Sales ($)	40	10.42	5.04	13.85	0.47	71.32
1st day end-price ($)	40	21.55	17.50	15.46	6.00	94.00
1st day end-price/Sales ($)	40	13.92	5.62	19.88	0.35	91.75
1st day underpricing (%)	40	25.38	16.19	45.52	-56.75	161.25
Net Income ($ million)	40	127.62	1.20	642.48	-389.60	3,817.00
Net income margin (%)	40	-7.94	0.59	40.28	-124.50	59.97
Gross Profit ($ million)	40	477.60	114.07	1,615.44	-46.50	9,915.00
Gross Margin (%)	40	62.22	68.23	26.38	-30.27	92.88
Marketing Expenses ($ million)	40	55.34	31.67	78.52	0.00	393.00
Marketing Expenses/Sales (%)	40	25.64	20.84	22.48	0.00	92.81
R&D Expenses ($ million)	40	88.18	16.34	329.87	0.00	2,073.00
R&D Expenses/Sales (%)	40	13.40	10.84	11.52	0.00	42.50
Media Hype	40	97	12	452	0	2,870
Unique visitors (million)	26	10.38	1.32	29.63	0.00	152.64
Page views (million)	26	2,505.92	14.97	12,233.14	0.00	62,476.26
Total Assets ($ million)	40	797.63	194.77	2,182.64	22.60	12,617.00

4 Methodology

Regarding the methodology we follow Trueman et al. (2000) although we extend their model by examining not only the explanatory power of web traffic as a non-financial measure, but also the media hype as a possible explanatory non-financial variable, and by allowing the comparison between them.

We estimate the following linear regression model:

$$Y'_j = \alpha_0 + \alpha_1 . \log(TA_j) + \alpha_2 \frac{NTINC_j}{S_j} + u_j \qquad (4.1)$$

Our dependent variables (y), proxy for equity value, include the Price/Sales ratio measured at the time of the IPO (IPOPRICE/S) and Price/Sales ratio measured at the end of the first day (1stdayENDPRICE/S). This model is also used to analyze whether some of the exogenous variables can help predicting the level of underpricing. In this last case the underpricing is measured as the first day return (1stdayUNDERP).

The use of the price-to-sales ratio, rather than price-to-book as dependent variable, follows Demers and Lev (2001) study and is explained by the fact that Internet companies have few intangible assets and their expenditures on the intangible assets are generally expensed rather than capitalized. Therefore the price-to-book ratio does not have the same economic interpretation as it does in the cross-section of more established and profitable firms, assuming several times a negative value.

As explanatory variables we use the net income margin (net income divided by sales) of the IPO firm in the year before the IPO (NTINC/S), controlled by firm size, proxy by the natural logarithm of Total Assets in the last year before the IPO (log TA)[12].

[12] As suggested by Wooldridge (2008), the logarithm is used in order to narrow the range of the variable. This makes estimates less sensitive to outlying (or extreme) observations on the Total Assets variable.

Following Trueman et. al (2000) we then decompose the net income variable into three of its components (deflated by sales):

$$Y_j = \alpha_0 + \alpha_1 . \log(TA_j) + \alpha_2 \frac{GP_j}{S_j} + \alpha_3 \frac{MKTG_j}{S_j} + \alpha_4 \frac{R\&D_j}{S_j} + u_j \qquad (4.2)$$

At this stage, instead of using the net income margin as explanatory variables we include: Gross Margin, gross profits (revenues minus cost of revenues) divided by sales (GP/S); Marketing Expenses divided by sales (MKTG/S) and R&D Expenses divided by sales (R&D/S). All measured in the last fiscal year before the IPO. By decomposing net income into its components, we allow for the possibility that the individual income statement line items can provide more information regarding future cash-flows. This could be the case of investors considering some expenses to actually be investments in the company's future cash-flows. This decomposition is particularly important for Internet firms that are growing rapidly, and spending significant amounts of money to ensure the continuation of this growth (Trueman et. al, 2000).

Finally, we augment regressions (4.1) and (4.2) by including alternately three non-financial measures as explanatory variables. We include a measure of media hype, and two measures of web traffic, the number of unique visitors and page views. Media hype is measured by the natural logarithm of the number of mentions of the company in the press, web and social media and multimedia seven days before the IPO and the natural logarithm of Unique Visitors (log VISITORS) and the natural logarithm of Page Views (log PAGEVIEWS), as measures of the number of unique visitors and page views.. Based on prior literature (Hand, 2001; Trueman et. al, 2000; Rajgopal et al., 2000), we expect signs of these variables to be positive.

5 Analysis and discussion of results

5.1 Price/Sales as the dependent variable

In Tables 2 and 3 we report the coefficients of regressing the Internet companies' price-to-sales ("P/S") ratios on a number of financial statement variables and non-financial variables, such as a media hype measure and two web traffic performance measures. We estimate these regressions at two different stages: at the IPO and at the end of the first trading day.

In regressions I and II of each Table we report the results of regressing P/S on net income, and on some of the components of net income, respectively (with all variables deflated by sales), without including any of the non-financial measures. Then we alternately include the non-financial variables in order to analyze the incremental explanatory power of these variables.

5.1.1 IPOPRICE/Sales as the dependent variable

As shown in Table 2, the impact of the net income margin (NTINC/S) on the IPO price is negative. However, it is only with the inclusion of non-financial measures that the coefficient associated to the net income margin is statistically significant.

These results are consistent with the results of other authors, such as Van der Goot and Knauff (2001), and suggest that, in this type of companies, losses enhance, not reduce, firm value, because the negative net income of Internet companies is a consequence of their investments in customer base creation and brand development (which leads to large costs in marketing and R&D).

Table 2 - Regressions for IPOPRICE/S

	Originals		Media Hype		Unique Visitors		Page Views	
VARIABLES	I	II	III	IV	V	VI	VII	VIII
NTINC/S	-14.133		-16.218*		-29.824**		-31.281***	
	(8,497)		(8,857)		(10.899)		(10.841)	
GP/S		9.640*		4.898		21.921		15.130
		(5,153)		(4.223)		(19.811)		(18.461)
MKTG/S		14.679		12.555		18.139		16.260
		(13.000)		(14.275)		(21.030)		(21.108)
R&D/S		37.071		50.956		35.655		37.931
		(26.351)		(32.669)		(34.547)		(35.881)
Log MHYPE			6.891***	2.264				
			(2.378)	(3,784)				
Log VISITORS					2.654*	-1.250		
					(1,534)	(2,621)		
Log PAGEVIEWS							3.476**	0.538
							(1,257)	(1,839)
Log TA	0.588	2.800	-1.007	2.880	5.603	4.551	5.043	4.407
	(2.996)	(3.581)	(2.962)	(4.789)	(3.532)	(6.240)	(3.027)	(6,058)
Constant	7.924	-10.843	2.962	-12.198	-20.554	-16.883	-28.343*	-22.773
	(6.708)	(10.377)	(5.983)	(11.678)	(13.131)	(15.405)	(14.363)	(17.411)
Observations	40	40	38	38	25	25	25	25
R-squared	0.167	0.254	0.304	0.318	0.473	0.250	0.549	0.244
Adjusted R-squared	0.122	0.169	0.242	0.212	0.398	0.054	0.484	0.046

Robust standard errors in parentheses. The results report White adjusted t-statistics to account for heteroscedasticity.
*** p<0.01, ** p<0.05, * p<0.1

These results are also consistent with Trueman et al. (2000) results, who detected a negative association between net income and market value. However, due to a very small adjusted R^2 (only 3 percent), the authors claimed that financial statement information is of very limited use in the valuation of Internet firms. In our case, the usefulness of the net income increases significantly if non-financial measures, such as media hype, unique visitors or pages views are included in the regressions.

The use of the components of net income (model II, IV, VI, VIII) only help explaining the IPO price in the cases where non-financial measures are not included. When non-financial measures are not included, the use of the components of net income (model II) - the coefficient associated to the Gross Margin - is statistically significant. The other components, MKTG/S and R&D/S, are insignificant in all the estimated regressions. These results suggest that, as concluded by Trueman et al. (2000), the financial statements *per se* are of limited use in valuing Internet firms.

The coefficients associated to the non-financial measures are only statistically significant when included with the net income margin. In the presence of the net income components (regressions IV, VI, VIII), these variables lose their statistically significant predictive capability. This might suggest that the individual income statement line items and the non-financial measures may capture, at least partly, the same information. Once the information conveyed by the components of net income is taken into account, the informational role of media hype disappears.

The results clearly show that non-financial measures are very important explaining IPO prices, particularly when the components of net income are not available. All three coefficients associated to non-financial measures are statistically significant and the adjusted R^2 jumps from 0.122 in the regression without any non-financial measure to 0.242, 0.398 and 0.484 in the regression with media hype, unique visitors and page views variables included, respectively.

The result regarding media hype is opposite to the findings of Bhattacharya et al. (2009) that concluded that the media coverage was not a significant factor in the Internet bubble. However it is consistent with prior literature (Demers and Lev, 2001; Trueman et al., 2000; Rajgopal et al., 2000; Hand, 2001) regarding web traffic measures.

Comparing the impact of all non-financial measures, the results suggest the two web traffic measures (the logarithm of Unique Visitors and the logarithm of Page Views) have more explanatory power of the IPO price (adjusted R^2 of 0.398 and 0.484, respectively) than the media hype (0.242). Notwithstanding, the impact of all variables is aligned, and considering that the media hype data is normally available for more companies (40 vs. 26 in our sample) than the web traffic measures, media hype can substitute web traffic measures in helping to predict IPO prices of Internet companies. It is also important to note that the use of any of the non-financial variables along with the net income can substitute, with better results, the use of the components of net income, as the regressions that include non-financial (alongside with net income) have more explanatory power than the regressions that used the components of net income as exogenous variables.

Finally, it's important to notice that the firm size (proxy by the natural logarithm of Total Assets) is insignificant in all regressions.

5.1.2 1stdayENDPRICE/Sales as the dependent variable

The IPO price is defined by the underwriter (investment bank) and the company directors. Although the final IPO price should reflect the expected market stock price, there are several motivations (discussed earlier in the literature review) that can lead the investment bank and the company directors to set an IPO price above (or, as normally happens, below) the market stock price. To account for that, in this section, the stock price at the end of the 1st trading day (deflated by sales) (1stdayENDPRICE/Sales) will be used as proxy for the market equity value of Internet companies. Although, the results are in general similar to those for the regressions from the previous section, as shown in Table 3, there are some differences that deserved to be pointed.

Table 3 - Regression for 1stdayENDPRICE/S

	Originals		Media Hype		Unique Visitors		Page Views	
VARIABLES	I	II	III	IV	V	VI	VII	VIII
NTINC/S	-20.630**		-21.488*		-37.773**		-39.705***	
	(10,020)		(10.598)		(14.378)		(13.921)	
GP/S		6.287		1.634		28.390		20.567
		(7.966)		(6.484)		(24.385)		(22.182)
MKTG/S		22.761		19.355		23.801		21.951
		(20.277)		(22.472)		(28.660)		(28.333)
R&D/S		81.660**		99.703**		56.766		59.154
		(39.990)		(47.677)		(45.341)		(46.589)
Log MHYPE			8.921**	1.520				
			(3.337)	(5.133)				
Log VISITORS					4.601***	-0.453		
					(1.624)	(2.764)		
Log PAGEVIEWS							5.388***	1.503
							(1.422)	(1.783)
Log TA	-0.487	3.678	-2.888	4.328	5.813	5.034	4.864	4.693
	(3.920)	(4.674)	(4.114)	(6.242)	(4.539)	(7.574)	(4.176)	(7.396)
Constant	13.415	-15.351	8.513	-16.787	-30.005**	-28.447	-38.997**	-35.315*
	(9.757)	(13.353)	(9.482)	(15.404)	(13.099)	(16.543)	(15.992)	(19.814)
Observations	40	40	38	38	25	25	25	25
R-squared	0.177	0.354	0.251	0.403	0.457	0.310	0.541	0.317
Adjusted R-squared	0.132	0.280	0.185	0.309	0.379	0.125	0.475	0.138

Robust standard errors in parentheses. The results report White adjusted t-statistics to account for heteroscedasticity.
*** p<0.01, ** p<0.05, * p<0.1

First, the coefficients associated to net income margin are now all statistically significant, even in the case where none non-financial measures are included in the model. This result suggests that the market attributes more importance to the firms' net income margin when valuing IPO stocks from Internet companies, than the investment banks when setting up the offering price. Another important difference is related to net income components, while IPO price was related with the company's Gross Margin, market prices are more sensible to R&D expenses. The coefficients associated to this variable are positive and statistically significant (when not included with web traffic measures). This result is consistent with the findings of Demers and Lev (2001, pp. 356) for the dot-com bubble period. The authors concluded that "*despite the expensing in financial reports of all periodic expenditures on knowledge, customer acquisitions, and technology, investors make a distinction between expenses and investments. In particular, product development (R&D) and advertising expenses (customer acquisition costs) appear to be capitalized as assets by investors in their assessment of Internet company value during the "bubble" period when investors were more optimistic about the prospects of B2C companies".* Demers and Lev (2001) conclude however that after the bursting of the bubble in 2000, investors adopted a more skeptical attitude regarding intangible investments, which, as suggested by our results, appears to be lost once again.

Finally, coefficients associated to web traffic are of increased significance when included alongside with net income margin (regression V and VII).

5.2 Underpricing as the dependent variable

5.2.1 1st day Underpricing as the dependent variable

The Table 4 shows the coefficients of regressing the Internet companies' underpricing on the same financial and non-financial variables used before.

Given that investment banks and companies directors, when defining the IPO offering price, are more influenced by the Gross Margin, while investors/market attribute more importance to R&D Expenses, it is unsurprisingly that underpricing is negatively related to the former and positive related to the latter. However, the negative

impact of Gross Margin on underpricing only holds if web traffic measures are not included. On the opposite and consistently with our previous results, the coefficient associated to R&D Expenses is always statistically significant.

Table 4 - Regression for 1stdayUNDERP

	Originals		Media Hype		Unique Visitors		Page Views	
VARIABLES	I	II	III	IV	V	VI	VII	VIII
NTINC/S	-0.291		-0.238		-0.80		-0.89	
	(0.237)		(0.248)		(0.114)		(0.106)	
GP/S		-0.644*		-0.650*		0.377		0.385
		(0.356)		(0.367)		(0.380)		(0.400)
MKTG/S		0.627		0,570		0.268		0.282
		(0.372)		(0.411)		(0.285)		(0.264)
R&D/S		1.822**		2.047**		1.057**		1.045***
		(0.759)		(0.804)		(0.471)		(0.465)
Log MHYPE			0.52	-0.034				
			(0.115)	(0.114)				
Log VISITORS					0.086*	0.039		
					(0.042)	(0.049)		
Log PAGEVIEWS							0.072	0.033
							(0.043)	(0.045)
Log TA	-0.024	0.86	-0.45	0.115	-0.015	0.048	-0.032	0.041
	(0.102)	(0.107)	(0.112)	(0.125)	(0.112)	(0.106)	(0.120)	(0.108)
Constant	0.287	0.049	0.302	0.039	-0.284	-0.647*	-0.251	-0.641*
	(0.255)	(0.328)	(0.269)	(0.345)	(0.287)	(0.328)	(0.317)	(0.335)
Observations	40	40	38	38	25	25	25	25
R-squared	0.070	0.294	0.056	0.306	0.141	0.388	0.136	0.390
Adjusted R-squared	0.019	0.213	-0.027	0.197	0.018	0.227	0.013	0.229

Robust standard errors in parentheses. The results report White adjusted t-statistics to account for heteroscedasticity.
*** p<0.01, ** p<0.05, * p<0.1

Another alternative explanation for these results would be, knowing that Internet companies are riskier companies, issuers of riskier IPOs may have to underprice their IPO stock prices relative to the actual value of the stocks, in order to induce investors to participate in the IPO, inducing the underpricing. If indeed underpricing is as a sign of the riskiness of the IPO, our results suggest that a higher amount of sales spent on R&D expenses is a sign of a riskier Internet company and so, the issuer has to induce a higher underpricing, while a higher Gross Margin is a sign of a more stable and mature company and so the issuer can induce a lower level of underpricing.

Regarding the non-financial measures, the coefficients associated to the media hype variable are not statistically significant. This conclusion is contrary to the findings of DuCharme et al. (2001a) - having found strong evidence that underpricing increases with the extent of media exposure, especially coverage in the electronic media the firm attracts seven days before the IPO date. However, this result is consistent with the fact that the media hype impact both the offer price and the market price (measured as the price at the end of the 1st trading day).

The only non-financial measure significantly related to the underpricing is the number of visitors, suggesting that investors attribute more value to the number of visitors than the investment bank and the companies' directors when setting up the offering price or, alternatively, that the number of visitors, given its volatility over time, is a measure of the company's riskiness. A final justification for this relation between the number of visitors and the underpricing, can lay on the fact that this measure could be seen as an indicator of irrational attractiveness of the IPO (in part the result that we were expecting for the media hype). This means that the underpricing is higher with a greater number of page visitors, not because the IPO price is not reflecting fundamental values about cash flows, but because investors are influenced by the hype about the Internet and some specific companies and transfer those beliefs into the stock price, ignoring information about cash flows.

6 Summary and Conclusions

Despite the recent hype around a potential bubble 2.0 in Internet industry, the studies focusing on recent Internet IPOs value drivers are still rare or nonexistent. This dissertation tries to fill this gap, by exploring the impact of the major (financial and non-financial) value-drivers, identified by former research during the previous dot-com bubble, on the Internet companies' IPO stock price and whether that impact differs from the one observed in the previous dot-com wave.

Consistent with the results of previous research this study finds that the lower the net income margin, the higher the IPO price. Although this result may apparently be counterintuitive, many authors, analysts and commentators defend that on Internet companies, losses enhance, not reduce, firm value, since their low (or even negative) net income is a consequence of investments in customer base creation and brand development. Our study shows that the use of the net income to predict the IPO price increases significantly if non-financial measures, such as media hype, unique visitors or pages views are included in the regressions. On the contrary, the use of the components of net income, more specifically the Gross margin only help to explain the IPO price in the cases where non-financial measures are not included. These results suggest that, as concluded by Trueman et al. (2000), the financial statements *per se* are of limited use in valuing Internet firms.

When the price is determined by the trading market (at the end of first trading day), we found a positive significant coefficient for R&D/S (when not included with web traffic measures). This result is consistent with the previous finding and with the results of Demers and Lev (2001) study for the bubble period. The authors conclude that the product development (R&D) appear to be capitalized as assets by investors in their assessment of Internet company value during the bubble. Demers and Lev (2001) conclude, however, that after the bursting of the bubble in 2000, investors adopted a more skeptical attitude with regards to intangible investments, which as suggested by our results, appears to be lost once again.

Consistent with the results obtained during the dot-com bubble, we found that in recent years Internet companies' stock prices are still strongly impacted by non-traditional value-drivers. We noticed a positive significant association between Media

Hype/Web traffic measures and the P/S ratio at the two different stages, but only when included with net income margin. We found the incremental explanatory power of web traffic measures (especially page views) to be more relevant to predict P/S ratio rather than the media hype variable.

The results found for media hype (when compared with the ones during the dot-com bubble) might suggest that the Internet itself, as a worldwide channel for media spread, with its increasing rate of penetration and usage over the years and its new ways to communicate, may lead to an increasing association between media hype and Internet stock prices. This finding assumes greater importance if we consider this sector to be more prone to retail than institutional investing, where less sophisticated but active investors believe the hype about the Internet and transfer those beliefs into asset prices, ignoring information about cash flows.

We also found that the adjusted R^2 is incrementally higher on the price at the end of the first trading day than on the offering price, which suggests that the market attributes more importance to our explanatory variables when valuing IPO stocks from Internet companies, than the investment banks when setting up the offering price.

Consistently with our previous results, we found Gross Margin to have a negative impact and R&D Expenses to have a positive impact. Since underpricing can be interpreted as a sign of the riskiness of the IPO, the results suggest that the higher the amount of sales spent on R&D expenses, the higher the Internet company risk and, on the other hand, the higher the Gross Margin, the lower the risk of the Internet company.

Regarding non-financial measures, only the number of visitors is significantly related to the underpricing, suggesting that investors attribute more value to the number of visitors than the investment bank and the companies' directors when setting up the offering price or, alternatively, that the number of visitors, given its extreme volatility over time, is a measure of the company's risk. Another possible justification for this relation between the number of visitors and the underpricing, can be the fact that this measure could be seen as an indicator of irrational attractiveness of the IPO. This means that the underpricing is higher with a greater number of page visitors, not because the IPO price is not reflecting fundamental values about cash flows, but because investors are influenced by the hype about the Internet and some specific companies and transfer those beliefs into the stock price, ignoring information about cash flows.

Overall, our findings lead us to conclude that in recent years, Internet companies' value drivers still depart from conventional wisdom, with net income being negatively priced and R&D expenses viewed as investments and positively priced. Our results suggest that the availability of a substantial amount of non-financial data on Internet usage is being used by investors to supplement the relatively sparse financial information with non-financial data in the valuation process, being employed in the prediction of future revenues, as it provides information about the extent of consumer interest in the web business and is central to revenue generation and growth of Business to Consumer (B2C) Internet firms.

Our findings are, of course, constrained by the fact that our final sample has only 40 companies and by the availability of only 26 observations for web traffic data.

There are many additional issues of interest that lie within this line of research and could be explored in the future. Considering the several M&A transactions in the Internet industry in recent years (e.g. the acquisition of Instagram by Facebook and several others less hyped), one particularly promising area for future work is to explore the value drivers of Internet B2C companies mergers and acquisitions transaction prices, comparing the results with the ones found in this work. Another interesting investigation for future work is to study the association between the level of underpricing of these IPOs and their long-run performance, validating if, as defended by some authors, higher levels of underpricing are an indicator for a poor long-run performance. Given that the vast majority of the IPOs studied occurred in recent years, it may take some time before this issue can be successfully tackled.

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Appendix 1: Summary of studies regarding Internet stock prices value drivers

Source: Demers and Lev (2001), Trueman et al. (2000), Rajgopal et al. (2000), Bartov et al. (2002), Hand (2000), Hand (2001)

Methodology	Sample		Explained Variable	Value Drivers (Explanatory Variables)		Studies (author/year)
	No. Of Companies	Type of Companies		Financial Information	Non-Finantial Information	
Linear regression	84	B2C Internet Companies	P/S	(i) Marketing Expenses; (ii) Product development and R&D expenses; (iii) Cash burn;	Web Traffic: (i) Reach; (ii) Stickiness; (iii) Customer loyalty; (iv) Strategic Alliances;	Demers and Lev (2000)
	56	Internet Companies: (i) portals; (ii) content/community providers; (iii) e-tailers;	MV/BV	(i) Net Income; (ii) Gross Profits; (iii) Operating Expenses; (iv) Non Operatig Expenses;	Web Traffic: (i) unique monthly visitors; (ii) pageviews;	Trueman et al. (2000)
	92	Internet Companies: (i) portals; (ii) content/community providers; (iii) e-tailers; (iv) financial services sites;	MV	(i) Earnings; (ii) Book Value; Log (Total assets) - scale control	Web Traffic: (i) unique monthly visitors;	Rajgopal et al. (2000)
	98 Internet companies 98 non internet companies	Test sample: Internet Companies; Control Sample (criteria: the IPO date and the IPO size): Non Internet Companies;	(i) Initial prospectus price; (ii) Final offer price; (iii) Initial stock market price; Estimating three alternative specifications: earnings, cash flows, and sales as our performance measures;	(i) Earnings p/share; (ii) Operating Cash Flow p/share; (iii) Sales p/share; (iv) Book value p/share; (v) Annual sales growth; (vi) R&D p/share;	(i) Float - percentage of outstanding shares publicly traded; (ii) Partial - position of the final offer price relative to the expected price; (iii) Other control variables;	Bartov et al. (2002)

Methodology	Sample		Explained Variable	Value Drivers (Explanatory Variables)		Studies (author/year)
	No. Of Companies	Type of Companies		Financial Information	Non-Finantial Information	
Log-linear regression	274 net firms; 274 non net firms; 213 non net firms that went public at the same time as the internet companies;	Test sample: Internet Companies; Control Sample: (1) Random sample of publicly traded non internet companies; (2) Sample of publicly traded non internet companies that went public at the same time as the internet companies;	Log MVEquity	(i) Log BV; (ii) Log Core NI; (iii) Log Net Sales; (iv) Log Expenses; (v) Log Cost of Sales; (vi) Log General Expenses; (vii) Log R&D; (viii) Log Marketing Expenses		Hand (2000)
			Log MVEquity	(i) Log Book value of equity; (ii) Log Forecasted one year ahead earnings; (iii) Log Forecasted long run growth in earnings;	Web traffic: (i) Log number of unique visitors; (ii) Log number of page views; (iii) Log number of hours spent on the page views; Supply and demand forces proxies: (i) Log public float; (ii) Log percentage of public float sold short; (iii) Log degree of institutional ownership;	Hand (2001)

Appendix 2: The Sample Firms

This table lists the names, ticket symbols and IPO Exchange of the 40 Internet companies in our final sample. The initial sample consisted of firms retrieved by Capital IQ database companies which went public between 2009 and 2013. From this sample we retained only those firms that we judged to be Business to Consumer (B2C) models – 52 companies. We dropped 11 companies that went public in over-the-counter (OTC) markets because the information available is not the same to normal IPOs. We lost 1 company because basic information, such as the number of outstanding stocks, was not found.

	Firm name	Ticker	IPO Exchange
1	Ancestry.com Inc.	ACOM	Nasdaq Global Market
2	Angie's List, Inc.	ANGI	Nasdaq Global Market
3	AVG Technologies N.V.	AVG	New York Stock Exchange
4	Bankrate, Inc.	RATE	Nasdaq Global Market
5	Boingo Wireless, Inc.	WIFI	Nasdaq Global Select
6	CafePress Inc.	PRSS	Nasdaq Global Select
7	Carbonite, Inc.	CARB	Nasdaq Global Market
8	Changyou.com Limited	CYOU	Nasdaq Global Select
9	Demand Media, Inc.	DMD	New York Stock Exchange
10	E-Commerce China Dangdang Inc.	DANG	New York Stock Exchange
11	Facebook, Inc.	FB	Nasdaq Global Select
12	FriendFinder Networks Inc.	FFN	Nasdaq Global Market
13	Groupon, Inc.	GRPN	Nasdaq Global Select
14	HomeAway, Inc.	AWAY	Nasdaq Global Select
15	Jiayuan.com International Ltd.	DATE	Nasdaq Global Select
16	Kayak Software Corporation	KYAK	Nasdaq Global Market
17	LifeLock, Inc.	LOCK	New York Stock Exchange
18	LinkedIn Corporation	LNKD	New York Stock Exchange
19	MakeMyTrip Limited	MMYT	Nasdaq Global Select
20	NQ Mobile Inc.	NQ	New York Stock Exchange
21	OpenTable, Inc.	OPEN	Nasdaq Global Select
22	Pandora Media, Inc.	P	New York Stock Exchange
23	Phoenix New Media Limited	FENG	New York Stock Exchange
24	Qihoo 360 Technology Co. Ltd	QIHU	New York Stock Exchange
25	QuinStreet, Inc.	QNST	Nasdaq Global Select
26	Renren Inc.	RENN	New York Stock Exchange
27	Rosetta Stone, Inc.	RST	New York Stock Exchange

28	Shanda Games Limited	GAME	Nasdaq Global Select
29	Sky-mobi Limited	MOBI	Nasdaq Global Market
30	SouFun Holdings Ltd.	SFUN	New York Stock Exchange
31	Taomee Holdings Ltd.	TAOM	New York Stock Exchange
32	Trulia, Inc.	TRLA	New York Stock Exchange
33	Vipshop Holdings Limited	VIPS	New York Stock Exchange
34	Vitacost.com, Inc.	VITC	Nasdaq Global Select
35	Yandex N.V.	YNDX	Nasdaq Global Select
36	Yelp, Inc.	YELP	New York Stock Exchange
37	Youku Tudou Inc.	YOKU	New York Stock Exchange
38	YY Inc.	YY	Nasdaq Global Market
39	Zillow, Inc.	Z	Nasdaq Global Select
40	Zynga, Inc.	ZNGA	Nasdaq Global Select